Ministry of Fisheries
Te Tautiaki i nga tini a Tangaroa

National Fisheries Plan for Deepwater and Middle-depth Fisheries

New Zealand Government

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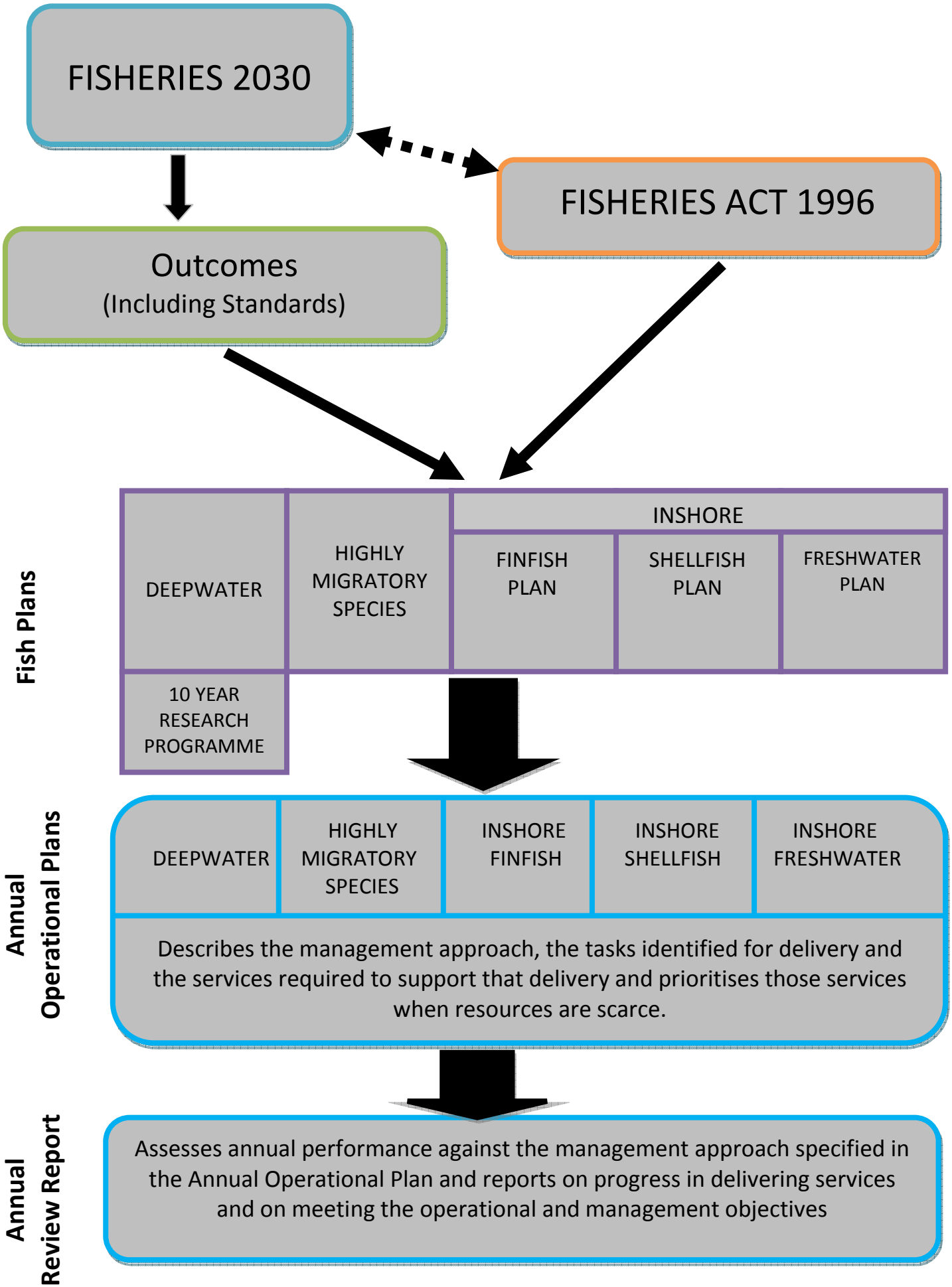
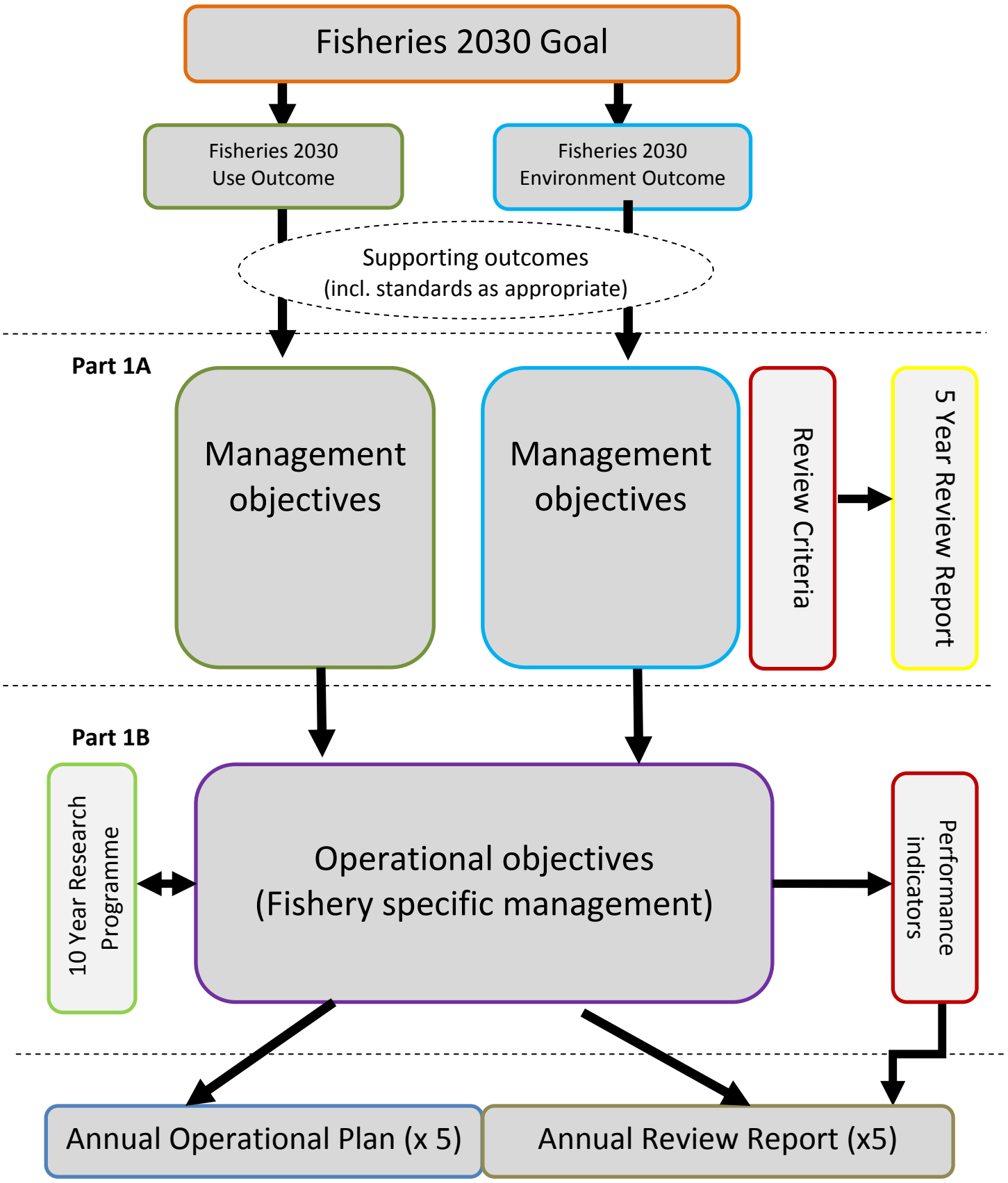
Part 1A

New Zealand Government

Fisheries Plans: Wider Context



National Deepwater Plan Structure



Summary of the National Deepwater Plan

Goal *(as specified in Fisheries 2030)*

New Zealanders maximising benefits from the use of fisheries within environmental limits

Outcomes *(as specified in Fisheries 2030)*

Use Outcome: Fisheries resources are used in a manner that provides greatest overall economic social and cultural benefit.

Environment Outcome: The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use.

Management Objectives

Use Outcome	MO 1.1	Enable economically viable deepwater and middle-depth fisheries in New Zealand over the long-term
	MO 1.2	Ensure there is consistency and certainty of management measures and processes in the deepwater and middle depths fisheries
	MO 1.3	Ensure the deepwater and middle-depths fisheries resources are managed so as to provide for the reasonably foreseeable needs of future generations
	MO 1.4	Ensure effective management of deepwater and middle-depth fisheries is achieved through the availability of appropriate, accurate and robust information
	MO 1.5	Ensure the management of New Zealand's deepwater and middle-depth fisheries are recognised as being consistent with or exceeding national and international best practice
	MO 1.6	Ensure New Zealand's deepwater and middle-depth fisheries are transparently managed
	MO 1.7	Ensure the management of New Zealand's deepwater and middle-depth fisheries meets the Crown's obligations to Maori.

Environment Outcome	MO 2.1	Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy
	MO 2.2	Maintain the genetic diversity of deepwater and middle-depth target and bycatch species
	MO 2.3	Protect habitats of particular significance for fisheries management
	MO 2.4	Identify and avoid or minimise adverse effects of deepwater and middle-depth fisheries on incidental bycatch species
	MO 2.5	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species
	MO 2.6	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on biological diversity
	MO 2.7	Identify and avoid or minimise adverse effects of deepwater and middle-depths fishing activity on the benthic habitat

Contents – Part 1A

1. Introduction

Purpose: The National Fisheries Plan for Deepwater and Middle-depth Fisheries (the National Deepwater Plan) sets the objectives to guide the management of deepwater and middle-depth fisheries (deepwater fisheries) within the New Zealand Exclusive Economic Zone (EEZ). It also describes the performance monitoring regime which will be used to assess if the prescribed objectives have been achieved.

Fisheries 2030 established the goal and outcomes that apply across the entire fisheries sector while the National Deepwater Plan specifically defines the:

- Management objectives for all of New Zealand's deepwater fisheries
- Review criteria that will be used to assess each fisheries' performance against the management objectives[1]
- Operational objectives for the management of individual deepwater fish stocks
- Performance indicators that will be used to assess the performance of each fishery against its operational objectives[2]
- Focus for the prioritisation and delivery of services by the Ministry of Fisheries (MFish) to achieve both the National Deepwater Plan and the actions specified in Fisheries 2030.
- Annual planning and review processes to support the implementation of the plan.

The National Deepwater Plan provides an overarching framework for the management of deepwater fisheries for a five year period. The management objectives and the review criteria used to assess performance against the management objectives are generic across all deepwater fisheries. In contrast the operational objectives and their performance indicators are fishery specific.

The high level management objectives specified in the National Deepwater Plan are the outcome of collaborative work between the Deepwater Group Ltd (DWG), representatives from environmental non-governmental organisations (eNGOs) and the Ministry of Fisheries (MFish). To a lesser extent stakeholders also inputted into the development of the operational objectives and the monitoring framework.

The successful implementation of the plan will be driven through five Annual Operational Plans. Each Annual Operational Plan will specify (1) how individual fisheries will be managed (2) the key tasks that will be undertaken to support the successful delivery of the operational objectives specified and (3) the core MFish services required to deliver these tasks. Performance will in turn be assessed through an Annual Review Report.

[1] Review criteria are used to assess performance against management objectives. They enable the measurement of where we are now versus where we will be in five year's time and should demonstrate how the management of the deepwater fisheries has improved over the five years of the National Deepwater Plan.

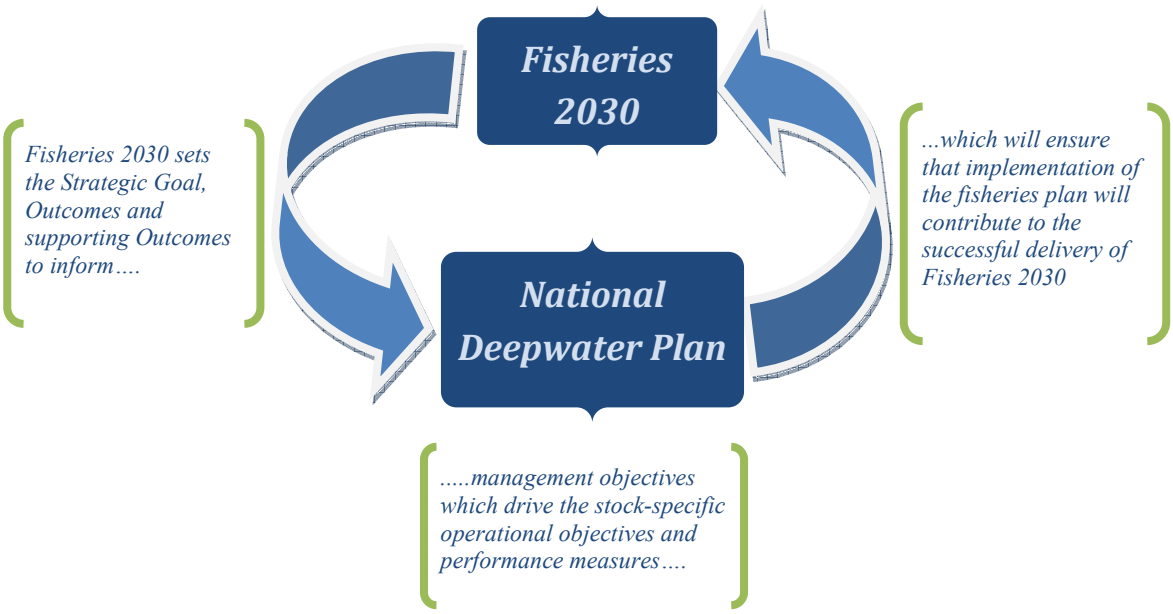
[2] Performance indicators provide information (either qualitative or quantitative) on the extent that an operational objective is achieving its desired outcomes.

2. Overview of the National Deepwater Plan

Fisheries plans are an integral component of the wider strategic context set by *Fisheries 2030*. It is therefore essential these plans clearly and transparently contribute to this wider strategic vision.

The schematic below depicts how *Fisheries 2030* and the National Deepwater Plan are linked. The three components of this schematic are discussed in the following sections:

1. *Strategic Context* describes how the goals, outcomes and supporting outcomes from *Fisheries 2030* inform the generic management objectives that apply across all deepwater fisheries
2. *Informing Management Objectives* describes the rationale, significance and status of the management objectives
3. *A Five Year Horizon – Implementing the National Deepwater Plan* describes the proposed implementation approach, including service specification and stakeholder engagement, and how implementing this plan will contribute to the delivery of the *Fisheries 2030* actions in the short-term and the outcomes and strategic goal over time.



Before discussing how the National Deepwater Plan fits within the wider strategic context described above, there are several important aspects of the National Deepwater Plan that should also be described; these relate to:

- Structure of the National Deepwater Plan
- Legal status of the National Deepwater Plan
- Scope of the National Deepwater Plan
- Timeframe for implementation.

Structure: Collectively the National Deepwater Plan consists of three parts.

- Part 1: Establishes the five year enabling framework for the management of New Zealand's deepwater fisheries. It is further divided into two parts – Part 1A and Part 1B
  - Part 1A details the overall strategic direction for New Zealand's deepwater fisheries. Specifically it describes:
    1. The wider strategic context that fisheries plans are part of, including *Fisheries 2030*
    2. The description and status of the management objectives that will apply across all deepwater fisheries
    3. How the National Deepwater Plan will be implemented and how stakeholders will be engaged during the implementation phase.

    Part 1A has been approved by the Minister of Fisheries under Section 11A of the Fisheries Act 1996. For more information on this please see the following section on Legal Status.

  - Part 1B incorporates the fishery-specific chapters of the National Deepwater Plan which provide greater detail on how deepwater fisheries will be managed at the fishery level, in line with the management objectives. The fishery-specific chapters will describe the operational objectives for the target fishery and key bycatch species and how performance against both the management and operational objectives will be assessed at the fishery level.

- Part 2: The Annual Operational Plan describes the management approach for deepwater fisheries, the tasks identified for delivery and the services required to support that delivery, for the financial year that the Operational Plan applies. The Annual Operational Plan also prioritises which services should be delivered and sets out the rationale for this prioritisation.
- Part 3: The Annual Review Report assesses the annual performance of deepwater fisheries against the management approach specified in the Annual Operational Plan and reports on progress towards meeting the operational objectives, management objectives and five year priorities described in Part 1.

Legal status: Section 11A of the Fisheries Act 1996 provides general guidance on what a fisheries plan may contain. Section 11A (2) states that a plan may relate to one or more stocks, fishing years, or areas or any combination of these things. Section 11A (3) states that the plan may include various things including fisheries management objectives to support the purpose and the principles of the Act.

Section 11A provided the legal basis for the development of the National Deepwater Plan and will guide its implementation through the Annual Operational Plan and Annual Review Report. However, none of the management objectives or the tasks to support these objectives will diminish the legal requirement to ensure the purpose and principles of the Fisheries Act 1996 are met. Over time, if there are conflicts between any part of the National Deepwater Plan and legislative obligations as set out in the Fisheries Act then the legislative requirements unequivocally take priority.

Part 1A of the National Deepwater Plan has been approved by the Minister of Fisheries (the Minister) under section 11A of the Act. In approving Part 1A the Minister has agreed to the following:

- The management objectives that will support the purpose and principles of the Act in guiding the management of all deepwater fisheries over the next five year period (pages 19 – 42 in Part 1A);
- The National Deepwater Plan structure, which includes the fishery specific chapters that exist or will be developed in Part 1B, the Annual Operational Plan and the Annual Review Report;
- How the National Deepwater Plan will be implemented (pages 43 – 53 in Part 1A); and
- The process for engaging with stakeholders on the implementation of the National Deepwater Plan (Pages 53 – 56 in Part 1A).

Although the Minister will be provided with an opportunity to consider the fishery specific chapters, the Annual Operational Plan and the Annual Review Report, these components of the National Deepwater Plan have not been approved under section 11A.

However, the structure of the National Deepwater Plan is such that any statutory intervention required to regulate deepwater fishing activity should be identified in the Annual Operational Plan. It will be linked, in turn, to the relevant fishery-specific chapter and the high–level management objectives specified the National Deepwater Plan. The Minister may also be asked to approve certain outputs from the operational objectives particularly when these outputs relate to his/her ability to meet statutory responsibilities e.g. harvest strategies.

Having given his approval, section 11 (2A) specifies that the Minister must take into account Part 1A of the National Deepwater Plan before s/he sets or varies any sustainability measure under Part III of the Act (sections 11—16), or when making any decision or recommendation to regulate or control fishing of deepwater species managed under this plan. This means that while the Minister must take into account Part 1A of the National Deepwater Plan s/he is permitted to make a decision that is different to what is set out in the plan, provided it is clear that in making that decision the content of the fisheries plan was taken into account.

Under section 12 of the Act the Minister is also required to consult if Part 1A of the National Deepwater Plan is amended or revoked. The consultation process should include reasons for

the proposed changes.

Finally, nothing contained in Part 1A of the National Deepwater Plan changes the Crown's obligations to Māori. Rather the National Deepwater Plan is a key means of giving effect to the Crown's obligations. With respect to commercial fisheries, the Crown's obligations are specified in legislation such as the Māori Fisheries Act 1989, the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 and the Fisheries Act 1996. More information on how the National Deepwater Plan will contribute to how the Ministry will deliver on its obligations to Māori is included in the section on "Stakeholder engagement".

Scope: This National Deepwater Plan addresses the management of New Zealand's deepwater fisheries. Management in this context includes the management of all target stocks, the management of bycatch fish stocks taken with the target species and the management of the environmental effects of fishing.

All deepwater species in the quota management system (QMS) have been ranked into two tiers according to their commercial importance (see Table 1). Tier 1 fisheries are high volume and/or high value fisheries and are traditionally targeted. They are important export revenue earners, which is reflected in the high quota value associated with these species. Tier 2 fisheries are typically less valuable bycatch fisheries or are only target fisheries at certain times of the year.

Table 1: Categorisation of deepwater species

Tier	Species [3] [4]
1	Hoki, hake, ling, southern blue whiting, jack mackerel, orange roughy, oreo, scampi, squid
2	Alfonsino, silver warehou, barracouta, cardinal fish, frostfish, ribaldo, ruby fish, spiny dogfish, white warehou, lookdown dory, pale ghost shark, blue mackerel, prawn killer, redbait, gemfish, deepwater crabs, dark ghost shark, sea perch.

As noted, Part 1 of the plan collectively specifies the high-level management objectives and, through the individual fishery specific chapters, translates these generic management objectives into operational objectives for each fishery. The fishery specific chapters describe how the management of Tier 1 species (and the Tier 2 bycatch stocks associated with these fisheries) will be monitored and how performance will be assessed. The fishery specific chapters that will, in time, be included are shown in Table 2. The timetable for inclusion of the remaining fisheries is also shown.

[3] Note that some stocks of these species will be managed by the inshore team because the bulk of the fishing comes from the inshore fleet particularly in FMAs 1 & 2

[4] Note that some stocks from a Tier 1 species may be managed as a Tier 2 stock based on the scale of the fishery e.g. SQU1J

Table 2: Proposed timeframe for the delivery of additional fishery chapters in the National Deepwater Plan

Chapter	Target species (Tier 1)	Bycatch stocks managed in conjunction with the target species*	Start date
2.1	Hoki	Silver warehou, spiny dogfish, frostfish, white warehou, lookdown dory	completed
2.2	Orange roughy	Black cardinalfish	completed
2.3	Southern blue whiting		June 2010
2.4	Ling	Ribaldo	November 2010
2.5	Hake		November 2010
2.6	Oreo	Rubyfish, alfonsino	tbc
2.7	Squid	Barracouta	tbc
2.8	Jack Mackerel*	Redbait/ relevant English mackerel stocks	tbc
2.9	Scampi	Prawn killer	tbc

* Note that only some stocks of these species will be managed through the National Deepwater Plan.

Timeframe: The National Deepwater Plan applies for five years, starting in the 2010-2011 financial year and ending in 2015-2016. A comprehensive review of the National Deepwater Plan will take place during 2014-2015. Based on the outcome of this review a revised National Deepwater Plan will commence during the 2015-16 financial year (starting 1 July).

During this five year period Iwi Fisheries Plans (IFPs) and Forum Fisheries Plans (FFP) will be developed.[5] IFPs and FFPs are the key tools for ensuring tangata whenua have effective input and participation at the appropriate levels of fisheries management decision making. Once an IFP/FFP is finalised, any specific objectives that relate to deepwater fisheries will be considered for inclusion in the Annual Operational Plan, where they will be prioritised for delivery. When the National Deepwater Plan is revised during 2014-2015 it will incorporate the relevant objectives from completed IFPs and FFPs.

[5] For more information on IFPs and FFPs please see the Ministry of Fisheries website at www.fish.govt.nz

3. Strategic Context

Fisheries 2030 sets the Strategic Goal, Outcomes and supporting Outcomes to inform….

Fisheries 2030 provides increased certainty about the government's goal for the fisheries sector, as well as defining the Ministry's priorities in supporting the sector to achieve this long-term goal. It is a government sector-wide strategy that addresses commercial fishing and aquaculture interests as well as the interests of tangata whenua and fisheries stakeholders.

Fisheries 2030 sets a long-term goal of New Zealanders maximising benefits from the use of fisheries within environmental limits. This goal encapsulates the ideal or aspirational state for New Zealand's deepwater fisheries.

Outcomes and Governance

Fisheries 2030 also specifies two outcomes which support the long-term goal; use and environment outcomes. Both outcomes describe what it will mean to maximise the benefits from the sustainable use of our deepwater fisheries resource and to ensure the health of the aquatic environment is maintained.

USE – Fisheries resources are used in a manner that provides greatest overall economic, social and cultural benefit

ENVIRONMENT – The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use

Each outcome is further specified through a series of supporting outcomes

USE – Fisheries resources are used in a manner that provides greatest overall economic, social and cultural benefit, including:

- An internationally competitive and profitable seafood industry that makes a significant contribution to our economy
- High quality amateur fisheries that contribute to the social, cultural, and economic well-being of all New Zealanders
- Thriving customary fisheries managed in accordance with kaitiakitanga, supporting the cultural well-being of iwi and hapu
- Healthy fisheries resources in their aquatic environment that reflect and provide for intrinsic and amenity value

ENVIRONMENT - The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use, including:

- Biodiversity and the function of ecological systems including trophic linkages are conserved
- Habitats of special significance to fisheries are protected
- Adverse effects on protected species are reduced or avoided
- Impacts, including cumulative impacts, of activities on land, air or water on aquatic ecosystems are addressed

Specifying goals and outcomes provides a general statement of the aspirations for deepwater fisheries. The *Fisheries 2030* goal, outcomes and supporting outcomes are deliberately high level and are not intended to be used to determine actions directly. Rather, *Fisheries 2030* sets the broad framework. The management and operational objectives discussed later in this National Deepwater Plan provide operational definition to this strategic vision – consequently they seek to deliver the Fisheries 2030 outcomes.

The *Fisheries 2030* goal and outcomes recognise that the purpose of New Zealand's deepwater fisheries is to derive value both in terms of economic and intrinsic value (the value an individual or community places on preserving a resource or environment in its own right). In turn the realisation of this value must occur in a way that ensures the sustainability of the resource and avoids, remedies or mitigates adverse effects of fishing on the aquatic environment. Specifically *Fisheries 2030* recognises that:

- The biological realities of harvesting our deepwater fisheries mean that the future value of these fisheries can only be assured if the resource is managed sustainably. Measures to increase value must always be considered in the context of ensuring long-term maintenance of both target and bycatch stocks.
- Deepwater target and key bycatch fish stocks exist as part of the broader aquatic environment, and that this broader environment has value, including an intrinsic value, to New Zealanders. It also recognises that, while fishing activities may have an environmental impact, not all environmental impacts have an adverse effect on the aquatic environment.
- Avoiding or minimising adverse effects on the aquatic environment will ensure that the long-term viability of associated or dependent species is assured and that the biological diversity and functionality of marine communities is maintained.
- The purpose of commercial fishing is to derive value and that the purpose of fisheries management is to enable best value to continue to be derived from New Zealand's deepwater fisheries. *Fisheries 2030* also recognises that in the long-term, economic value relies on the environmental sustainability of these fisheries.

Governance

Sound governance arrangements that are well specified, transparent and which support cost-effective and accountable decision making are necessary to ensure the successful delivery of these outcomes. To this end *Fisheries 2030* also describes a series of governance objectives.

The management of deepwater fisheries must be well informed and collaborative to ensure that the fisheries are valued by New Zealanders generally. This means that management of our deepwater fisheries must be seen to be credible, both nationally and internationally. Good and transparent governance structures are critical for success.

Good governance is also necessary to meet the objectives specified in this National Deepwater Plan. In terms of deepwater fisheries management it is proposed that the intent of the *Fisheries 2030* governance objectives - specifically with respect to the desire for an enabling framework that allows stakeholders to create optimal social, cultural and economic value - will be achieved through the revised DWG Memorandum of Understanding (MOU) and the creation of a structured Environmental Advisory Group (EAG). For more information on the MOU and the proposed EAG please see the section on the 'Stakeholder Engagement'.[6] [7]

Our Treaty partnership obligations, in the absence of IFPs and FFPs in the short-term, will be given effect through a structured engagement approach in collaboration with Te Ohu Kai Moana (TOKM). This is discussed in more detail in the section on Stakeholder Engagement.

Finally, the development of Annual Operational Plans and Annual Review Reports, which will be made publicly available, will also contribute to the desired accountable, responsive, and transparent system of management.

[6] The Deepwater MOU was initiated in October 2006 and was revised in 2008.

[7] Further discussion with stakeholders is necessary around the proposed EAG and the revised DWG MOU before either proposals are finalised.

4. Informing Management Objectives

....management objectives which drive the stock-specific operational objectives and performance measures....

The *Fisheries 2030* goal and supporting outcomes directly influence the management of deepwater fisheries by shaping the high level management objectives that apply across all deepwater fisheries.

Each of the specified management objectives contributes directly to the delivery of the *Fisheries 2030* outcomes. These management objectives are generally open statements which are not expressed in measurable terms.

However, a simple gap analysis allows an assessment of the current status of our deepwater fisheries in the context of these management objectives and the expected change (i.e. future status) that should exist at the end of the five year implementation period. Describing the expected future status in turn makes explicit a set of review criteria which facilitate monitoring progress towards achieving these management objectives over the five years.

In summary, each management objective is described in terms of its purpose and intent and of its current and future status. The future status clearly describes the expected outcomes that will be achieved through the delivery of the National Deepwater Plan. Also included is an overview of the five year priority assigned to each management objective. The priority status is determined using a set of broad criteria which are detailed below.

Priority	Description
P1	Management Objectives which are considered a high priority for delivery. This means that the focus in the early years of the National Deepwater Plan will be to deliver services and complete the tasks to deliver the fishery specific operational objectives that underpin P1 Management Objectives. Note that prioritisation status will be influenced by the timeframe for the completion of additional fishery specific chapters.
P2	Management Objectives where tasks to complete the operational objectives will be started in the early years of the plan, but will likely take the full five year period before the Management Objective has been achieved. Typically this is because the successful completion of more than one fishery-specific operational objective is required before the management objective has been achieved.
P3	Management Objectives which have a high priority but successful implementation is influenced by external factors. The influence of factors external to MFish can mean that despite a priority focus, these objectives may not be achieved during the initial five year timeframe.
P4	Management Objectives where the timeframe for the delivery of tasks to achieve the fisheries-specific objectives will occur during the latter part of the five year period. In some instances the management objectives may be achieved before the five year period has elapsed but in others successfully achieving the Management Objective will not occur until the second five year period.

Table 3 below provides an overview of each management objective including its prioritisation status and how it contributes to the strategic actions specified in Fisheries 2030.

Fisheries 2030		National Deepwater Plan		Five year prioritisation				
Objective	**Strategic Actions**	**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
10. Improve Fisheries Information	10.1 Improve our knowledge of fish stocks and the environmental impacts of fishing through implementing long-term research plans	MO1.4: Ensure effective management of deepwater and middle depths fisheries is achieved through the availability of appropriate, accurate and robust information	Successful implementation of a 10 Year Research Programme to ensure appropriate information is available to support fisheries plan objectives	P1				
5. Ensure sustainability of fish stocks	5.1 Set and implement fisheries harvest level standards	MO2.2 Maintain the genetic diversity of deepwater and middle-depth target and bycatch species	Information on sex and age class structure routinely collected for all species managed through the National Deepwater Plan and processes are in place to monitor trends in this information	P2				
		MO 2.1 Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy	Tier 1 deepwater stocks will be managed to an agreed harvest strategy based on biological reference points	P1				
	5.2 Enhance the framework for fisheries management planning including the use of decision rules to adjust harvest levels over time		Tier 2 deepwater and middle depths stocks will be managed using agreed management criteria where management based on a comprehensive set of biological reference points is not possible or appropriate.			P4		

Fisheries 2030			National Deepwater Plan		Five year prioritisation				
Objective	**Strategic Actions**		**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
6. Manage impacts of fishing and aquaculture	6.2 Set and monitor environmental standards for threatened and protected species and seabed impacts		MO2.3 Protect habitats of particular significance for fisheries management	Policy guidelines developed to determine what are habitats of particular significance (P1) application of policy guidelines to deepwater fisheries where necessary (P4)		P1	P4		
			MO2.4 Identify and avoid or minimise adverse effects of deepwater and middle-depth fisheries on incidental bycatch species	Completion of qualitative risk assessment for all non-QMS deepwater bycatch species to inform a monitoring and risk-based management approach		P2			
			MO2.5 Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long term viability of protected, endangered and threatened species	Continuation of existing measures to manage likely adverse effects on seabirds and marine mammals. Ongoing monitoring of nature and extent of interactions and, devise and implement mitigation measures when it is apparent that the impact is beyond acceptable levels (i.e. when assessed against an environmental standard)	P3				

Fisheries 2030			National Deepwater Plan		Five year prioritisation				
Objective	**Strategic Actions**		**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
6. Manage impacts of fishing and aquaculture	6.2 Set and monitor environmental standards for threatened and protected species and seabed impacts		MO2.6 Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on biological diversity	Ecological Risk Assessments completed for key deepwater fisheries which will include an assessment of the risks to biological diversity from deepwater fishing activity. Measures identified and partly implemented so as to address any unacceptable risks to biological diversity. Completion of ERA for HAK/HOK/LIN is P1 while completing ERAs for remaining fisheries is P4	P1		P4		
			MO2.7 Identify and avoid or minimise adverse effects of deepwater fishing activity on the benthic habitat	Review appropriateness of current benthic habitat measures (BPAs and seamount closures) in light of the revised marine environment classification. Additional protection methods will be implemented where necessary post 2013			P4		
9. Enable Collective management action	9.2 Strengthen Māori collective management arrangements		MO1.7 Ensure the management of New Zealand's deepwater and middle depths fisheries meets the Crown's obligations to Māori.	Annual Operational Plans and Annual Review Report will be presented to relevant iwi forums for their consideration.		P2			

Fisheries 2030			National Deepwater Plan		Five year prioritisation				
Objective	**Strategic Actions**		**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
9. Enable Collective management action	9.2 Strengthen Māori collective management arrangements		MO1.7 Ensure the management of New Zealand's deepwater and middle depths fisheries meets the Crown's obligations to Māori.	Annual Operational Plans will be the vehicle by which Iwi Fish Plan objectives relevant to deepwater plans will be prioritised for implementation.			P3		
				Greater commercial iwi involvement in the management of deepwater and middle depth fisheries facilitated through the Deepwater/MFish MOU	P3				
	9.1 Enable quota owners to take collective management action		MO1.2 Ensure there is consistency and certainty of management measures and processes in the deepwater and middle depths fisheries	Implement a more formal and structured co-management arrangement with commercial quota owners through a revised MOU	P1				
14. Ensure fisheries management system integrity	14.3 Optimise the level of voluntary compliance with fisheries laws and standards and maintain an effective deterrence against illegal activity		MO1.5: Ensure the management of New Zealand's deepwater and middle depths fisheries are recognised as being consistent with or exceeding national and international best practice	(1) Development and assessment of deepwater fisheries against a series of compliance benchmarks. (2) Regular reporting of performance through the Joint MFish/Industry Compliance Committee and the Annual Review Report	P2				

Fisheries 2030			National Deepwater plan		Five year prioritisation				
Objective	**Strategic Actions**		**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
14. Ensure fisheries management system integrity	14.1 Report each year on the state of NZ fisheries - including compliance with social, cultural, environmental and economic standards/objectives		MO1.6 Ensure New Zealand's deepwater and middle depths fisheries are transparently managed	Annual Review Report produced detailing the performance of the deepwater fisheries sector across a number of areas including: A) Economic performance of the deepwater fisheries sector assessed in terms of (1) quota value (2) export earnings and (3) ability of management decision to contribute to the value of the fishery. B) Sustainability performance assessed in terms of performance against relevant harvest strategy. Independent certification achieved and maintained for key deepwater and middle-depths species.		P1			
			MO1.2 Ensure there is consistency and certainty of management measures and processes in the deepwater and middle depths fisheries						
	14.2 Establish mechanisms to monitor Ministry and sector performance			Structured industry involvement in the management processes as part of co-governance through revised MOU	P1				

Fisheries 2030			National Deepwater plan		Five year prioritisation				
Objective	**Strategic Actions**		**Management Objectives**	**Response**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
1. Improve inter-sector allocation	1.2 Develop alternative stock management targets that ensure the sustainability of fish stocks		MO2.1 Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy	Tier 2 deepwater stocks will be managed using agreed management criteria where management based on a comprehensive set of biological reference points is not possible or appropriate.			P4		
2. Cost effective management and services	2.3 Review fisheries laws and regulations with a view to reducing compliance costs and improving effectiveness		MO 1.2 Ensure there is consistency and certainty of management measures and processes in deepwater and middle depths fisheries	Penalty framework and appropriateness of regulations reviewed through the MFish/Industry Joint Compliance Committee		P2			
	2.1 Implement more efficient models for planning, procurement and delivery of research and observer services		MO 1.1 Enable economically viable deepwater and middle-depth fisheries in New Zealand over the long-term	Successfully implementing the funding and contracting component of the 10 Year Research Programme	P1				
13. Improve management system performance	13.5 Ensure the provision of value for money fisheries management services, including efficient tangata whenua and stakeholder consultation arrangements.			All management decisions relating to deepwater and middle depths species are formally assessed in terms of their 'value' contribution		P1			

3. Increase trade and access	3.2 Achieve environmental certification of NZ fisheries and product traceability		MO1.1 Enable economically viable deepwater and middle-depth fisheries in New Zealand over the long-term	NZ deepwater fisheries are managed to a level that will enable selected fisheries to successfully achieve and maintain third party certification	P3

Note: MO1.3 does not directly link with Fisheries 2030 but in essence achieving the actions specified by F2030 should ensure that fisheries resources are managed so as to provide for the needs of future generations.

Management Objectives - Utilisation

MO 1.1	Enable economically viable deepwater and middle depths fisheries in New Zealand over the long-term

Description:

This management objective recognises the contribution that viable and profitable deepwater fisheries make to the New Zealand economy generally.

For this reason the management regime must be structured so that it can contribute to, and support, economically viable fisheries. It means that management measures should be assessed in terms of their value maximisation potential (within environmental limits) and on this basis only those measures that positively contribute to the value of the fishery should be progressed.

This management objective recognises the value in extractive use but also acknowledges that at times difficult decisions have to be made about the nature of this use. This is to ensure that viability and profitability do not just exist in the short-term but are available to New Zealand over the long-term.

How our management regime enables an economically viable deepwater fisheries sector should be transparent. In simple terms, the management framework should ensure that sustainability and environmental requirements are met in such a way that the cost and administrative burden to stakeholders is minimised. A constantly shifting management regime, where there is little understanding of the mechanics of the industry that is being regulated, can lead to uncertainty and increased costs and will unlikely enable value maximisation.

A fisheries management regime which ensures deepwater fisheries are being managed to a level that will support third party certification will also enable a more viable deepwater fisheries sector. The management regime must be sufficiently flexible to support the relevant fishery in meeting any conditions of certification that are put in place.

This is an enabling rather than a prescriptive objective and recognises that some elements that influence the economic viability of fisheries, such as exchange rates and fuel costs, are not within the control of fisheries managers. However, it does acknowledge that management costs and the costs of operating in the deepwater fisheries sector can be influenced through the implementation of the National Deepwater Plan.

Current status:

The current collaborative relationship with quota owners and harvesters through the DWG means there is already a concerted effort to ensure Government intervention only occurs when necessary. Every effort is made to engage with quota owners to develop the appropriate management intervention that will achieve the government's desired outcome and to ensure that this intervention is reasonable, cost effective and is not administratively cumbersome.

To date only the hoki fishery has achieved third party certification although hake, ling and southern blue whiting are currently being assessed.

The success, or otherwise, of the management regime in enabling an economically-viable deepwater fisheries sector can be reflected in some of the standard indicators of value, particularly quota value. Information is available for the following key economic indicators across deepwater stocks:

- The current value of quota across all deepwater fishstocks is estimated to be $2.14 billion.
- Cost recovery levies across deepwater fisheries have averaged approximately $19.1 million and currently account for 0.9% of the total quota value.[8]
- Export earnings across all deepwater fisheries are currently $700M (approx).
- Cost recovery levies account for 2.7% of the total export revenue.
- Number of deepwater fisheries successfully certified – currently 1 of 1 (hoki).

Future status:

While recognising there are external factors that can influence the economic viability of the deepwater sector, the following indicators may collectively provide an assessment of whether, in the intervening five year period, the management approach has contributed to an economically viable seafood industry.

- Real quota value for deepwater stocks has increased.
- Real export revenues have increased.
- Processes are in place to ensure management decisions are formally assessed in terms of their value contribution prior to being implemented and that both government and quota owners participate in this process.
- Increase in the number of fisheries that apply for and successfully achieve third party certification.

Priority status: P1

Given the wider government priority of improving economic performance, measures to support this objective will be delivered as a priority during the early years of the plan.

MO 1.2	Ensure there is consistency and certainty of management measures and processes in the deepwater and middle-depth fisheries

Description:

This management objective recognises that credible fisheries management is achieved when there is clear rationale behind why management measures are in place and specifically when these management measures are implemented as part of a consistent management framework.

New Zealanders should be confident that their deepwater fisheries are internationally recognised as being well managed and that the issues typically associated with the global management of fisheries, such as overexploitation, overcapacity and environmental degradation, are not applicable to New Zealand's deepwater fisheries. It should be clear that if and when issues or concerns emerge there is a comprehensive management programme in place to address such issues.

[8] Based on average MFish and DoC levies between 05/06 to 07/08 fishing years.

Achieving consistency and certainty in the fisheries management context can also deliver value to commercial fishers by providing certainty around the extent of management intervention, the limits around how they can operate, and the associated costs. It can also provide a stable regulatory environment within which operators can make informed business and investment decisions.

Current status:

Although New Zealand's deepwater fisheries are managed by the Ministry of Fisheries in collaboration with deepwater quota owners there is no overarching framework to guide objectives-based fisheries management. Key management decisions are typically determined on an annual basis and are rarely assessed in terms of their likely cost and benefit. The lack of specific harvest strategies for the majority of deepwater stocks also makes it difficult to factor management interventions into business planning.

There is widespread consultation across all stakeholder groups and interested parties on proposed management measures and every effort is made to incorporate stakeholders' views into final management interventions.

There is some information available on the levels of compliance with regulatory and non-regulatory measures but this information is not always in a consistent or usable form.

There is no single source that provides information on the management approach across all deepwater fisheries in a form that all parties can understand.

Future status:

Management decisions are clearly linked to a set of agreed high-level objectives for a fishery. The proven collaborative management regime ensures there is stakeholder participation in the development and implementation of management changes. This collaborative approach means there is good exchange of information to enable full cost/benefit assessments of proposed management measures.

The management approach and decisions are documented and are publicly available in a format that is accessible to all interested parties.

Priority status: P1

This management objective is considered a priority for implementation. Although New Zealand may have a fisheries management regime that is recognised as world leading, for many stakeholders it seems to consist of complex science information and isolated short-term management decisions that are unconnected to any long-term objective. In order for New Zealanders to maximise benefits from the use of fisheries they have to both understand and accept the management regime.

MO 1.3	Ensure the deepwater and middle depths fisheries resources are managed so as to provide for the reasonably foreseeable needs of future generations

Description:

This management objective recognises that the management of deepwater fisheries should be undertaken to achieve long-term profitability rather than short-term gain. This objective also recognises that value is not simply economic value but can also include social, cultural

and intrinsic values. This means that strategies to maximise economic return in the short-term must not impact on the ability for the fishery to provide for the reasonably foreseeable needs of future generations.

The foreseeable needs of future generations encapsulates not only the need to ensure the availability of a commercially-viable fishery to future generations of fishers and quota owners but also the need to provide for social and cultural needs and to preserve the broader ecosystem. Preservation of the broader ecosystem meets the needs of future generations by preserving both the intrinsic value and the potential to use as yet unknown resources in the future.

Current status:

The foreseeable needs of future generations, including intrinsic and bequest values, have not been specifically identified in relation to deepwater fisheries. Current management is focussed on ensuring sustainable catch limits and avoiding, remedying or mitigating the adverse effects of fishing on the aquatic environment.

Future status:

The successful implementation of the National Deepwater Plan ensures there is a greater public awareness and understanding of how New Zealand's deepwater fisheries are managed. There is also wider public acknowledgement both within New Zealand and internationally that New Zealand's deepwater fisheries management regime is world leading and that deepwater seafood products are acknowledged as the sustainable choice.

Priority status: P3

This management objective is classed as a P3 priority because delivering this objective is dependent on the successful completion of the other management objectives. It is likely that this management objective will not be completed during the initial five year implementation period.

MO 1.4	Ensure effective management of the deepwater and middle-depth fisheries is achieved through the availability of appropriate, accurate and robust information

Description:

This management objective recognises that credible fisheries management requires information and data that is both robust and fit for purpose. Information is necessary to support the development of management measures and, once these measures are implemented, assessing performance in terms of delivering expected outcomes.

The successful delivery of the National Deepwater Plan is contingent on the right data and information being available. This issue applies across all deepwater fisheries and is being comprehensively addressed through the development and implementation of the 10 Year Research Programme for deepwater fisheries.

Current status:

The current management of some of the key deepwater fish stocks is supported by a robust and comprehensive stock assessment programme (hoki, southern blue whiting, orange roughy-in part). However there is insufficient data and information available to assess the status of the remaining Tier 1 target stocks and the associated Tier 2 bycatch stocks. Nor is there sufficient information available to fully assess the nature and extent of any adverse

environmental effects associated with deepwater fishing activity.

Future status:

The successful implementation of the 10 Year Research Programme means there is sufficient and consistent information available to assess the status of all QMS deepwater stocks and to monitor the effects deepwater fishing on the marine environment. All Tier 1 and Tier 2 stocks have agreed harvest strategies in place and, the availability of increased data on associated bycatch stocks facilitates the development and implementation of management strategies for these species.

Information is available on the full nature and extent of environmental interactions and this information allows for the successful monitoring of deepwater fisheries against environmental standards.

Priority status: P1

This management objective is considered a priority for implementation because good quality, comprehensive and consistent information is critical to the successful delivery of the remaining management objectives.

MO 1.5	Ensure the management of New Zealand's deepwater and middle-depth fisheries is recognised as being consistent with, or exceeding, national and international best practice

Description:

This management objective requires that all deepwater fisheries are recognised in New Zealand and in international markets as being managed to best practice standards as a minimum. This can be achieved through:

1. Independent third party certification;
2. Ensuring participants in these fisheries operate within the legislative, regulatory and management framework in place; and
3. Formally assessing the fishery against international standards or best practice guidelines.

New Zealand has a comprehensive legislative and regulatory regime that all deepwater fishing activity must operate within. To ensure these fisheries consistently meet legal and regulatory obligations there should be compliance, management and environmental standards and benchmarks in place against which the performance of the fishery can be assessed.

Achieving this international recognition is also a critical component of delivering on MO1.1, as fisheries that are compliant with international best practice are generally able to perform better in markets thereby having positive outcomes in terms of export revenues generated.

Current status:

Although New Zealand's fisheries management regime is internationally recognised as world leading there is poor public perception both within New Zealand and internationally on the management of individual deepwater fisheries (e.g. hoki, squid and orange roughy). The successful Marine Stewardship Council certification of the hoki fishery has only addressed

these views to a certain extent.

Future status:

The management regime for deepwater fisheries enables the successful certification of Tier 1 deepwater fisheries (as appropriate) and supports the maintenance of the certification during the five year certification period. The sustainable management of New Zealand's deepwater fisheries is acknowledged not just within the fisheries sector but by seafood consumers and the wider public both within New Zealand and internationally.

Priority status: P1

This management objective is considered a priority for implementation because achieving international best practice will underpin the value maximisation potential for deepwater fisheries. The ability for any fishery to be assessed against international standards or third party certification schemes is contingent on a sustainable management framework underpinned by good data, information and research.

MO 1.6	Ensure New Zealand's deepwater and middle-depth fisheries are transparently managed

Description:

Credible fisheries management is achieved when sustainability, value and environmental objectives are consistently and transparently achieved. Transparency results when the process around developing and implementing management strategies is understood by all with an interest in the management of deepwater fisheries.

This means that the management regime is widely accessible and is understood by all interested parties - from school children to large retailers and seafood distributors. To achieve this, the right information must be available in the right format and to the right level of detail. This management objective recognises that information may have to be tailored to meet different users' needs, but that the primary focus is to ensure that interested parties can access the information they require.

This management objective recognises that there should also be transparency in the processes that will be followed should management, environmental or compliance performance fall below the agreed standards, targets or benchmarks.

Current status:

Information currently available on the management of New Zealand's deepwater fisheries 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 people with an interest in the management framework in place across all deepwater fisheries. However through section 12 consultation stakeholders have access to information relating to management interventions.

Future status:

The management decisions within this framework are easily accessed and understood by all. Comprehensive information describing the management approach is available through the Annual Operational Plan and the Annual Review Report and these reports are recognised, nationally and internationally as the single source for management information. Through the

availability of these documents there is greater public and media awareness and understanding of how deepwater fisheries are managed.

Priority status: P1

This management objective is considered a priority for implementation because public understanding is critical to enable New Zealanders to maximise benefits from the use of fisheries. In deepwater fisheries this is expressed in terms of:

- Businesses operating in the deepwater fisheries sector having the correct information to support business decisions.
- ENGO groups and consumers are able to assess that the environmental impacts from deepwater fishing activity are addressed appropriately.

MO 1.7	Ensure the management of New Zealand's deepwater and middle-depth fisheries meets the Crown's obligations to Māori

Description:

This management objective recognises that the Crown's obligations to Māori influence how deepwater fisheries are managed. Specifically this management objective recognises that in delivering this plan it is critical that:

1. It actively enables tangata whenua to input and participate in the management of the fishery, and provides a clear expression of kaitiakitanga so that it can be given particular regard to by the Minister when fulfilling their section 12(b) obligations under the Act;[9] and
2. Any measures implemented do not compromise the Crown's settlement obligations.

Discussions with Māori representatives to date suggest that maximising the return from their quota and responsibly managing their quota assets are important objectives for them, and that the plan should seek to support these. To deliver these Māori objectives it will be important to ensure the distinction between ensuring the long-term sustainability of the asset and the short-term income stream is explicit.

Current status:

There is currently limited iwi involvement in the management of deepwater fisheries. Only twelve iwi have membership of the DWG and only three of these iwi could be considered to be actively involved. Improving this level of engagement through input and participation processes, will be a priority focus of the National Deepwater Plan.

Actions taken by MFish to date to provide for input and participation needs have included:

- Writing to each Iwi forum advising members, through the MFish Pou Hononga team, that work was about to start on developing on a National Deepwater Plan and seeking their views on how they would like to be engaged.
- Circulating draft iterations of the National Deepwater Plan to members of the DWG which includes twelve iwi.

[9] The Ministry considers that the obligation to "provide for the input and participation" is a more active duty than consultation generally requiring earlier engagement with tangata whenua (at the option definition stage, rather than the evaluation of options). It implies some responsibility to help build the capacity of tangata whenua to participate in fisheries management processes, rather than just supplying information on those processes.

- Liaising with TOKM directly about options to achieve greater iwi involvement in the deepwater fisheries management.

Future status:

Iwi are actively involved in the DWG or have processes in place to ensure they have a mechanism to engage early in deepwater fisheries management issues.

The successful development of IFPs and FFPs means there are SMART[10] objectives in place to support iwi interests with respect to deepwater fisheries. These objectives will be considered for inclusion in the Annual Operational Plan and performance in meeting these objectives is monitored through the Annual Review Report.

Priority status: P2 & P3

This management objective is a priority during the implementation period. However the ability to incorporate IFPs/FFPs into the National Deepwater Plan is contingent on the successful development and approval of IFPs/FFPs. Equally, the ability to increase iwi participation in the DWG is not fully within the control of this plan.

[10] SMART – specific, measurable, achievable, realistic and timely.

Management Objectives - Environment

MO 2.1	Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy

Description:

This management objective recognises the importance of a sound harvest strategy to support sustainable fish stock management. The critical components of a harvest strategy are:

1. Biological reference points (or agreed proxies) against which the performance of the fishery will be monitored;
2. A harvest control rule (HCR) that will apply to the fishery to ensure the biomass fluctuates within the target range; and
3. A rebuild strategy for the fishery that will be applied if the stock falls below an acceptable level.

Reference points are biological benchmarks against which the abundance of the stock or the fishing mortality rate can be measured in order to determine stock status. Reference points provide guideposts for the performance of the fishery and signal when management action is appropriate and the form that this management action might take. At a minimum these reference points should include limits and management targets. The appropriate management response will vary depending on where a stock is in relation to the reference points but will be guided by the HCR established.

In simple terms an HCR is a set of well-defined rules that can be used as the basis for determining annual catch limits. The HCR should describe (rather than prescribe) the type of management intervention that should be taken depending on the status of the stock. In some instances the action might be to gather more information or to continue to monitor fishing activity against the current TAC. In other cases, more direct action might be proposed. For example if a stock has fallen below a limit reference point then a TAC reduction or the formal adoption of a rebuild strategy will likely be the most appropriate management responses.

The final component of a harvest strategy is a rebuild strategy. The purpose of a rebuild strategy is to guide the specific management response that should occur if a stock falls below the management target to a level where stock recruitment may be impaired. Implementing a rebuild strategy for a stock will require a catch limit reduction.

In the absence of a stock-specific harvest strategy the Harvest Strategy Standard will be used as a default. All stock-specific harvest strategies that are developed will be consistent with the Harvest Strategy Standard.[11]

All deepwater fisheries have been ranked according to their commercial importance (see Table 4). The immediate focus is on the development of stock-specific harvest strategies for all Tier 1 stocks.

The long-term aim is to also develop appropriate harvest strategies for Tier 2 stocks. This is

[11] Ministry of Fisheries (2008) Harvest Strategy Standard for New Zealand Fisheries. 25p.

dependent on the 10 Year Research Programme delivering sufficient data to estimate $B_{current}$ and B_{MSY} (or other appropriate metrics) which will in turn provide the baseline information to support a harvest strategy.

Tier 3 fisheries are incidental bycatch species that are not currently managed under the QMS but are caught during deepwater fishing activity. These species will be addressed through MO 2.4.

Table 4: Categorisation of deepwater species

Tier	Species[12] [13]
1	Hoki, hake, ling, southern blue whiting, jack mackerel, orange roughy, oreo, scampi, squid
2	Alfonsino, silver warehou, barracouta, cardinal fish, frostfish, ribaldo, ruby fish, spiny dogfish, white warehou, lookdown dory, pale ghost shark, blue mackerel, prawn killer, redbait, gemfish, deepwater crabs, dark ghost shark, sea perch.
3	Incidental bycatch species - non-QMS species which are usually discarded or rendered to fish meal and are considered to be of nil or low commercial value.

Current status:

Stock-specific harvest strategies have only been developed for a handful of Tier 1 stocks, and for many of the remaining stocks, there is insufficient information to support comprehensive harvest strategies.

Future status:

All Tier 1 stocks have stock-specific harvest strategies in place which explicitly determine the appropriate management interventions and harvest levels. This information is understood by all parties so that management interventions are expected when stock status fluctuates beyond specified levels.

For Tier 2 stocks there is sufficient information available to allow for the development and implementation of alternative management strategies which may include stock specific harvest strategies.

Priority status: P1

Under the QMS, setting TACs is the primary mechanism to ensure stocks are fished sustainably. The high priority of this objective also reflects the legislative requirement under section 13 of the Fisheries Act 1996 to, generally, set TACs that move the biomass of the stock toward or above B_{MSY}.

Note that the status of these management objectives is also influenced by timeframes for completing additional fishery-specific chapters as specified in Table 2.

[12] Note that some stocks of these species will be managed by the inshore team because the bulk of the fishing comes from the inshore fleet, particularly in FMAs 1 & 2.

[13] Note that some stocks from a Tier 1 species may be managed as a Tier 2 stock based on the scale of the fishery e.g. SQU1J

MO 2.2	Maintain the genetic diversity of deepwater and middle-depth target stocks and key bycatch species

Description:

It is important that the genetic diversity within a fish stock is maintained to ensure stocks are resilient to environmental change.

Fishing pressure may reduce the genetic diversity in a fish stock either by selecting particular genotypes (e.g. fishers may target areas favoured by fish with a particular genetic makeup) or simply by removing a large proportion of fish present in a stock thereby restricting the range of genotypes present.

If a stock has been reduced to very low levels at some point in its history, genetic diversity is likely to be low and such a stock may not be genetically equipped to cope with environmental change. The key to meeting this objective is to ensure that all deepwater stocks, including sub-stocks, are not reduced to levels that may jeopardise their long-term viability. Maintaining stocks around target levels should achieve this.

Measures to maintain habitat diversity and the diversity of non-target species are captured in the remaining management objectives under the Environment Outcome.

Current status:

There is limited information available on the sex and age structure of deepwater species with the exception of some of the Tier 1 stocks. The management regime typically focuses on individual stock levels rather than considering the implications of the management approach on the genetic diversity of the species.

Future status:

Through the 10 Year Research Programme there is sufficient information to record and monitor trends in sex and age information across all QMS species (Tier 1 and Tier 2) managed through the National Deepwater Plan.

Priority status: P2

The implementation of the 10 Year Research Programme will mean that information to support this objective will be collected from year one for Tier 1 and Tier 2 species. Ensuring we have the capability to monitor trends in this information will be a priority during the final two years of this five year implementation period.

MO 2.3	Protect habitats of particular significance for fisheries management

Description:

Habitats of particular significance to fisheries management are those habitats associated with important life history stages of key deepwater stocks, and associated bycatch stocks. These habitats may include areas associated with spawning or feeding activity or areas where juvenile fish congregate. This objective recognises that any significant change to these habitats may have an impact on the distribution and health of deepwater species. For this reason it is important that such habitats are identified and that an appropriate management regime is in place to ensure that they are protected.

Current status:

It is unclear what is meant by 'habitats of particular significance to fisheries management' and there are currently only ad-hoc non-regulatory protection measures in place for certain species - such as the hoki management areas to protect juvenile hoki. There are other forms of marine protection in place across the EEZ (seamount closures and benthic protection areas (BPAs)) but the effect and adequacy of these closures on the wider habitat protection has not been assessed.

Future status:

Policy guidelines are in place determining the criteria for what should be considered as a 'habitat of particular significance'. Based on these criteria, and where protection of these habitats is considered necessary, a programme of protection is developed. The priority focus of such a programme will be on ensuring that the suitability of existing protection measures are first assessed before new protection measures are considered.

Priority status: P1 & P4

With the exception of the development of the policy guidelines (P1) this management objective has been given a P4 priority status because there are no immediate management concerns which would require that it is implemented during the early years of the National Deepwater Plan. It is expected that the policy guidelines and any programme of protection measures will be developed during the next five years but that the actual protection of the habitats may not be completed within this timeframe.

MO 2.4	Identify and avoid or minimise adverse effects of the deepwater and middle-depth fisheries on incidental bycatch species

Description:

The Fisheries Act 1996 requires that adverse effects of fishing on the aquatic environment should be avoided, remedied or mitigated.

This management objective recognises that deepwater fisheries will have some environmental impact on incidental bycatch species (i.e. those species that have no commercial value and which are typically discarded).

These incidental bycatch species are typically information deficient so it is difficult to assess when an environmental impact is having an adverse effect. Regularly monitoring bycatch levels will ensure that trends in harvest levels and biological characteristics can be monitored.

Where an adverse environmental effect is identified the management priority will be to avoid or minimise the effect so it is no longer adverse.

Current status:

The reporting requirements for QMS species means there is good information on the extent of harvest levels for these non-target QMS species.

However, there is limited information on the extent of actual interactions with non-QMS

bycatch species. The most reliable source of information is observer coverage and the quality of this information is influenced by the extent of coverage in a particular fishery. There is little information available on the status of these non-QMS bycatch species and the likely risk to their long-term sustainability is unknown.

Future status:

A qualitative risk assessment for non-QMS bycatch species is completed under the 10 Year Research Programme. Comprehensive annual monitoring of bycatch species ensures that we are able to assess when harvest levels are considered to be adverse and can make the appropriate management intervention. This intervention can include section 11 measures such as gear restrictions or catch limits or, QMS introduction following an assessment against the *Standard for Introducing Species to the QMS.*

QMS bycatch species are managed under MO2.1.

Priority status: P2

This management objective will be ongoing during the five year implementation period. The risk assessment will be completed during 2011-2012 and the increased observer coverage from the 10 Year Research Programme will improve monitoring of those higher risk non-QMS bycatch species. Any management interventions necessary when risk levels are considered unacceptable will be prioritised in the Annual Operational Plan as required.

MO 2.5	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species

Description:

This management objective recognises that within the aquatic environment there are species that are particularly significant to New Zealanders, both due to their intrinsic value and because of their status as endangered or threatened species.

MOs 2.3 and 2.4 ensure that adverse effects on habitat and incidental bycatch species generally are avoided or minimised. This objective acknowledges the special status of endangered, threatened and protected (ETP) species and ensures that action is taken so that fishing activity in New Zealand's deepwater fisheries does not have an adverse effect on the long-term viability of these species.

Not all interactions with ETP species will constitute an adverse effect on their long-term viability and when interactions occur, additional management intervention above that already in place will not necessarily be required.

Interactions with ETP species will be monitored and the point at which these impacts are deemed adverse will be identified. The point at which an impact becomes adverse will be informed by the best available scientific research. However the management response may also be influenced by societal views as to what is an acceptable level of impact or environmental change.

This point may be explicitly specified in future through environmental standards. When this occurs deepwater fisheries will be managed so that fishing activity ensures that any ETP interactions are within the limits set by the standard.

Current status:

There have been considerable improvements in the management of ETP species interactions over the last 3-4 years (e.g. seabirds and sea lions). Some of these improvements have been driven by regulatory intervention and some by non-regulatory measures supported by a structured and comprehensive implementation, education and audit programme.

The absence of environmental standards has meant that the management response has been to monitor interactions and to strive for continuous improvement.

Future Status:

Environmental standards are in place and the management measures implemented previously mean that deepwater fisheries are already achieving or close to achieving the performance measures set by these standards. When a fishery is unable to meet an environmental standard, mitigation measures will be developed which will be informed by research delivered as part of the 10 Year Research Programme.

Priority status: P3

Notwithstanding the Ministry's priority focus on the development and implementation of environmental standards, this is a high profile issue and is a priority focus for eNGOs. There is a wider concern that in the absence of environmental standards the impact that deepwater fishing activity has on ETP species may be at unacceptable levels.

This is also a priority focus for commercial stakeholders who want (1) greater certainty around the requirements and cost of managing ETP interactions and (2) reliable information on environmental performance to support their brands in overseas markets and (3) to be able to meet third party certification criteria.

The ability to fully achieve MO2.5 will also be influenced by the availability of environmental standards, as appropriate.

MO 2.6	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on biological diversity

Description:

This management objective complements MO 2.1, MO 2.2, MO 2.3, MO 2.4 and MO 2.5. Although these management objectives relate to specific components of the aquatic environment (target and bycatch species, benthic habitats, incidental bycatch species and ETP species) they collectively contribute to the maintenance of biological diversity.

MO 2.6 is more holistic in scope and addresses the impact of fishing on all aspects of the aquatic environment, including consideration of trophic linkages, and symbiotic or commensal relationships between species.

Current status:

Research and information on the full extent of adverse interactions on the biological diversity of the aquatic environment, including trophic relationships, due to deepwater fishing activity is limited. To date this work has only been partly completed for the Chatham Rise.

Future Status:
Ecological Risk Assessments (ERA) completed for all Tier 1 deepwater species and a programme is in place to address the identified risks.

Priority status: P1 & P4
The P1 status reflects the requirement to complete an ERA for hoki and other species seeking Marine Stewardship Council's certification.

The P4 priority status acknowledges that:

- Achieving this management objective is influenced by how successfully the other management objectives under the Environment Outcome are delivered.
- Increased data collection is necessary to inform ERA work – this will be achieved through the 10 Year Research Programme.

MO 2.7	Identify and avoid or minimise adverse effects of deepwater fishing activity on the benthic habitat

Description:
This management objective recognises that deepwater fishing activity may physically impact on the benthic environment.

Benthic habitats can be important breeding grounds, foraging areas, or refuges for target, bycatch or ETP species. As such, ensuring that any impact is carefully managed and remains within acceptable limits is an important component of sustainably-managed deepwater fisheries.

Significant progress has been made in protecting the seabed through BPAs and other spatial closures. The spatial management approach will be retained in order to allow fishing to continue while providing appropriate protection to the benthic environment. Existing management measures will be assessed and if necessary amended to ensure relevant standards are met.

Current status:
Existing regulated measures (BPAs and seamount closures) protect 32% of New Zealand's EEZ from bottom trawling.

Information on the nature of marine habitats has been updated through the recently revised *Benthic Optimised Marine Environmental Classification* and the soon to be available results from Oceans 2020.

Future status:
There are appropriate levels of benthic habitat protection in place across the EEZ and there is public awareness and support for these measures. There is also widespread acknowledgement that trawling is a sustainable fishing method provided it is governed by appropriate management controls.

Priority status: P4
As a condition of the BPA initiative there was a conditional commitment given to quota

owners that no further benthic protection measures would be implemented in the EEZ until after 2013. Ongoing monitoring of trawl footprint and the completion of initiatives outside this plan will determine whether further measures are required after 2013. The implementation of any additional measures will likely extend beyond the initial five year period of this iteration of the National Deepwater Plan.

5. A five year horizon – implementing the National Deepwater Plan

....which will ensure that implementation of the fisheries plan will contribute to the successful delivery of Fisheries 2030

The National Deepwater Plan is a critical component of the strategic framework for the wider fisheries sector. The links between the high level management objectives and the *Fisheries 2030* strategic actions have been described above in Section 3. Successful delivery of these actions will form the basis for value creation and improved environmental performance in the long term.

In moving from the strategic to the operational the focus shifts from management objectives to fishery-specific operational objectives (contained in Part 1Bof the National Deepwater Plan). Delivering the tasks that support the fishery-specific objectives will ensure we are meeting the management objectives for deepwater fisheries. In turn this will directly contribute to the strategic actions specified in *Fisheries 2030* allowing government and stakeholders to achieve the wider strategic vision of maximising benefits from the sustainable use of fisheries resources within environmental limits.

Successfully implementing the National Deepwater Plan will require clear specification of the tasks for delivery that underpin the operational objectives, and the resources and services that are needed. The implementation approach allows for the annual prioritisation of tasks to enable decisions to be made about how to deploy limited management resources across deepwater fisheries.

This section moves from the strategic to the operational by describing at a high-level

- How the National Deepwater Plan will be implemented (the implementation approach)
- What will be required to support implementation (services to support implementation)
- Who will be involved (future stakeholder engagement).

Implementation approach

The mechanism to implement the National Deepwater Plan and to report on performance towards meeting both the operational and management objectives will be achieved through two key documents:

1. Annual Operational Plan for Deepwater and Middle-Depth Fisheries (Part 2 of the National Deepwater Plan)
2. Annual Review Report for Deepwater and Middle-Depth Fisheries (Part 3 of the National Deepwater Plan).

Annual Operational Plan The National Deepwater Plan provides an overarching framework for the management of deepwater fisheries for a five year period. It deliberately does not include details of the day to day management measures that will be implemented for each individual fishery. Nor does it specify the required services, delivery mechanism and service prioritisation issues that must be considered.

This information will be specified in the Annual Operational Plan for deepwater fisheries. The Annual Operational Plan will set out:

1. How individual fisheries will be managed during the fishing year
2. Key tasks that will be undertaken to support the successful delivery of the operational tasks specified in the individual fishery chapters
3. The core services (compliance, research and regulatory) that will be required in each fishing year to deliver fisheries objectives. In situations where there are limited business group resources and competing tasks and objectives, the Annual Operational Plan will also prioritise which services should be delivered including a rationale for this prioritisation.

The description of how individual fisheries will be managed will include:

1. Relevant TACs and TACCs.
2. The harvest strategy in place for the fishery. In the early years of the National Deepwater Plan this will simply reflect the status quo management regime until a stock specific harvest strategy is developed. Once finalised, the harvest strategy will include reference points, harvest control rules and a rebuild strategy in conformance with the Harvest Strategy Standard.
3. Environmental standards against which the performance of the fishery will be assessed.
4. Economic indicators which will provide a measure of whether the economic value maximisation objectives are being achieved.
5. Performance of the fishery against the compliance benchmarks.

These five items may remain unchanged from one year to the next, or some or all may change as new information becomes available or as stock-specific objectives are finalised.

The tasks specified in the Annual Operational Plan will contribute directly to the delivery of the operational objectives described in Part 1B of the National Deepwater Plan. Each task or action will be a discrete activity which should be accomplished within a defined period of time.

Details of the services required to ensure the successful delivery of these tasks and actions will also be specified including:

1. The nature of the service
2. The organisation responsible for delivery – MFish or DWG
3. If MFish is responsible for delivery then details of the business groups that will contribute to service delivery and the resources required
4. Prioritisation of services (across deepwater fisheries only).

The Annual Operational Plan will be developed in conjunction with stakeholders and will be produced no later than the April before the start of the next financial year. Its production will be aligned with Ministry of Fisheries' internal planning and prioritisation processes.

Annual Review Report

Monitoring the successful delivery of tasks to support stock-specific objectives and the performance of individual fisheries against the relevant harvest strategy, environmental standards etc. will be through a formal annual review process. This will culminate in the publication of an Annual Review Report on the performance of deepwater fisheries against that year's Annual Operational Plan.

The Annual Review Report will be completed by December for the financial year ended 30 June. This report will also include relevant information concerning the performance of deepwater fisheries during the previous fishing year that ended on 30 September. It will also identify the progress made in meeting those objectives specified in IFPs and FFPs that were included in the Annual Operational Plan.

Once the Annual Review Report is finalised it will signal a mid-year review of the Annual Operational Plan. This is to ensure tasks and services continue to be prioritised appropriately given the results of the annual review.

Both the Annual Operational Plan and the Annual Review Report will be publicly available. These documents will also be presented to the Minister of Fisheries.

Services to support implementation

Successful implementation of fisheries plans is a Ministry-wide responsibility and will require input and commitment of resources from across the Ministry. A primary focus of fisheries plans - in addition to the goal of improving our fisheries management regime - is to provide a planning tool to ensure the Ministry's resources and activities are transparently allocated and are targeted towards achieving agreed objectives.

This section of the National Deepwater Plan describes broadly the nature of the Ministry's services and the approach for ensuring the objectives specified in this plan drive service delivery. Fine scale specification of services to support fishery specific objectives will be described in the Annual Operational Plan which will be developed in collaboration with the relevant service provider.

The key services that will contribute to the delivery of the National Deepwater Plan include:

1. Compliance services (delivered by the Ministry's Field Operations group)
2. Research and Monitoring (delivered through the 10 Year Research Programme for Deepwater Fisheries)
3. Registry and regulatory services (delivered by the Ministry's Strategy Group).

Additional services that will be required less frequently also include legal advice, corporate communications and IT and data/information support. Collectively these services will be delivered by the Ministry's Organisational Services Group and the Office of the Chief Executive.

The collaborative management regime that exists between MFish and the DWG (given effect through the MOU) means there is flexibility around how tasks are delivered and who is responsible for providing the service. Services may be delivered exclusively by the Ministry, exclusively by the DWG or shared by both parties.

Information and Monitoring

Although there is considerable information on fisheries generally, there is still uncertainty around the status of the majority of deepwater fishstocks and the environmental effects that may result from fishing these stocks.

A long-term research approach (the 10 Year Research Programme) has been developed concurrently with the National Deepwater Plan. The outcomes the 10 Year Research Programme seeks to achieve include:

1. Establish a comprehensive, robust and consistent data collection and analysis programme that will provide the baseline information necessary to meet our statutory obligations and to achieve successful third party certification of New Zealand's deepwater fisheries
2. Establish a consistent time series of data and, where feasible, continue any existing time series
3. Achieve a fleet-wide biological and catch sampling programme for all deepwater vessels through full observer coverage

4. Deliver better value through multi-year research contracts and a more robust procurement strategy and contracts monitoring regime
5. Utilise both fishery-independent and fishery-dependent data and information.

The 10 Year Research Programme is the mechanism to deliver on the research and monitoring objectives described in the fisheries specific chapters (Part 1B) of the National Deepwater Plan. Specifically the 10 Year Research Programme will ensure that data and information is available to:

1. Monitor key fisheries against stock specific harvest strategies
2. Monitor biomass trends for bycatch species
3. Assess fishery performance against environmental standards
4. Enable more timely responses to sustainability and environmental impact issues; and
5. Deliver comprehensive monitoring across the deepwater fleet through a programme of increased observer coverage.

The 10 Year Research Programme has been approved for implementation and it is expected to drive the majority of deepwater research from the start of the 2010-2011 financial year.

The 10 Year Research Programme describes how and what baseline data will be collected to inform the management of deepwater fisheries. It also specifies the routine research necessary to meet the management objectives e.g. monitoring of environmental interactions and routine stock assessments to determine stock status in line with harvest strategies.

As the National Deepwater Plan progresses there may be individual fishery objectives that require additional research beyond the structured research currently proposed in the 10 Year Research Programme. When this occurs the fishery-specific research requirements will be specified in the Annual Operational Plan. The additional research requirements will be funded through the 10 Year Research Programme ' additional research' budget.

A description of the key components of the 10 Year Research Programme can be found in Appendix 2.

Compliance services

Meeting fisheries management objectives is dependent upon high levels of compliance with the various sustainability and allocation rules defined in legislation. The Ministry's compliance and enforcement activities are based on education, monitoring, surveillance, audit, analysis, investigation and prosecution of offences. Multi-agency strategies, both overt and covert, help the Ministry to maximise effectiveness and efficiency when monitoring commercial activities.

The deepwater fisheries sector is a highly regulated industry. An extensive regulatory regime under the Fisheries Act conditions fishing activities – and there are a range of other rules under legislation governing labour, general environment, protected species, food safety, etc. Changes to any of the laws, regulations, rules or policies in respect of the harvesting, production, processing, preparation, distribution, packaging or labelling of deepwater fisheries products can have a significant business impact.

Areas of compliance concern in deepwater fisheries relate primarily to misreporting in terms

of areas fished (trucking), species fished (falsifying returns) and quantities taken (discarding and high grading) – particularly with respect to the operation of foreign charter vessels. The scale of fishing activity in the deepwater sector can mean that offending can be lucrative although the costs if detected are high and can result in vessel forfeiture, imprisonment and monetary penalties of up to $250,000.

Since 2009 MFish has revised its compliance model with respect to commercial fisheries. Prior to this the focus had been directed at breaches of the law through surveillance and extensive investigations. This approach has now changed and while there will continue to be a role for enforcement activity it will now be supported by a less aggressive model of informed and assisted compliance.

This new compliance model focuses on the following four key stages:

- **Voluntary** – Fishers are fully informed and comply voluntarily
- **Assisted** – Fishers will comply where information is available informing them how to comply and where the focus of fishery officer activity is on assisting fishers to comply
- **Directed** – Fishers have the opportunity to offend but (1) the availability of information and (2) patrol and inspection activity from fishery officers, supported by infringement notices and penalties for non-compliant behaviour, move fishers to a compliant state
- **Enforced** – Compliance response to deliberate offending, fraud and criminal activity resulting in a substantial surveillance and investigation focus where identified breaches of law will be 'prosecution' focused. The Enforced state is deployed when voluntary, assisted and directed states have been breached.

The key change, from a deepwater perspective, is that compliance activity is now also focused on informing and assisting fishers to comply, in addition to the traditional enforcement model.

The application of this model is reflected in the recent extension of the collaborative arrangement between the Ministry and the DWG with respect to fisheries management to the compliance arena.[14] This collaborative arrangement is given effect through a Ministry/DWG compliance group that actively works together in deepwater fisheries. This includes:

1. Developing information sheets on key compliance issues in deepwater fisheries
2. Using existing industry briefings as an opportunity to brief vessel operators on areas of compliance concern
3. Identifying current areas of legislation and management measures which may, inadvertently, be contributing to levels of non-compliance and identifying ways to address these
4. Collectively monitoring the performance of the deepwater sector against a set of agreed benchmarks.

[14] For more information on the MFish/DWG compliance committee, including details of the Terms of Reference for this group please see the MOU at www.fish.govt.nz

The Ministry's Field Operations Group will be expected to contribute to the delivery of the National Deepwater Plan across the following areas:

1. Routine at-sea and port-based monitoring (includes aerial and vessel based surveillance, port inspections and LFR inspections)
2. Targeted monitoring e.g. SLEDs specification and use, seabird mitigation, adherence to fishery-specific management measures
3. Participation in industry-operator briefings as required
4. Compliance benchmarking – including the production of quarterly information sheets summarising results of the most recent benchmarking exercises and trends in performance
5. Participation in the joint Ministry/DWG compliance group
6. Preparation of information and general communication documents to support informed and assisted compliance e.g. regular Compliance Information sheets
7. Regular exchange of monitoring information with the fisheries management team so that:
    a. results of monitoring activity can be assessed against fishery specific objectives and
    b. areas of particular concern are identified using a risk-based approach to determine where future services may need to be targeted.

These services are generic in that they are relevant to and support all deepwater fisheries. In the Annual Operational Plan these generic services will be more specifically tailored to the individual fisheries to reflect the fishery specific objectives.

There are also compliance services that will not be driven by the National Deepwater Plan although there will be linkages between such activity and the on-going management of deepwater fisheries. These services include targeted investigative activity (likely to be fishery specific) to support prosecution cases.

Observer Services is also a function of the Field Operations Group. While observers have a role in observing at-sea performance against regulations, the primary focus of the Observer Programme, from a deepwater perspective, is to support the comprehensive data collection programme under the 10 Year Research Programme. For this reason, observer coverage requirements for deepwater fisheries services will be specified through the 10 Year Research Programme.

Regulatory and Registry Services

Regulatory framework

The fisheries management regime is supported by a complex series of fisheries regulations. These regulations can be stock or species specific, such as a minimum legal landing size, or can be generic across an area or type of fishing method or vessel size category.

In deepwater fisheries the majority of the rules are generic and apply to all vessels operating in the sector irrespective of what species is being targeted. However, a distinction is made, particularly in the area of environmental mitigation, for fishing method type. For example mandatory seabird mitigation measures are different for trawl vessels and long-line vessels.

It is not the role of the National Deepwater Plan to initiate a comprehensive review of the regulatory package that supports the management of deepwater fisheries. Undoubtedly there may be regulations that will no longer be relevant, in that the issues that they were initially put in place to address have changed or no longer exist. However, the extent of the regulatory framework is such that to systematically review each regulation that applies in the deepwater sector would be time consuming and resource intensive, and will come at the expense of delivering on other more valuable objectives.

Instead this plan, through the delivery of the individual stock/species objectives, will identify those regulations which are likely to hinder the successful delivery of management tasks to support objectives-based fisheries management. When this occurs the relevant regulation will be reviewed to assess:

- the original rationale (problem definition) which warranted the regulation in the first instance
- the validity of the rationale today and in the foreseeable future
- risk and implications associated with removing the regulations
- Support for, and cost and benefit of, removing or amending the regulation.

In implementing the National Deepwater Plan there may also be situations where the most appropriate management response is to regulate.

There will also be an opportunity to review appropriateness of regulations through the joint MFish/Industry Compliance Committee. This group will from time to time identify regulations for review. These regulations will then be assessed using the criteria described above and will be retained, removed or amended as appropriate.

Registry services

The Act provides for a range of QMS administration activities to support commercial fishing. These include permitting, vessel registration, cost recovery management, quota and ACE trading and the collection and management of statutory catch reporting from commercial fishers. These services are commonly referred to as registry services.

Almost all of these services are delivered by an external agency (FishServe) either under a 'devolved' delivery model (where the Ministry specifies the quality of service but FishServe is funded directly from quota holders) or under contract (where the Ministry funds the delivery of service and recovers these costs through cost recovery levies).

Accurate assessments of the quantum of each stock harvested are an integral component of a fisheries management regime. Such assessments in deepwater fisheries consist of extensive at-sea reporting by vessels of both quantities of each stock harvested and environmental interactions. Further reporting on landing (in the form of monthly harvest returns and the licensed fish receiver returns) means that quantities of catch can be traced from harvest through to export or domestic markets. This recordkeeping and reporting framework is the key mechanism for determining catch against catch limits.

There is no proposal to amend either the broader catch reporting or registration regime at this time. However, by delivering objectives-based fisheries management it may be apparent that existing catch documentation or vessel registration systems should be modified to ensure the most relevant information is being collected to support management of the resource. If this occurs, the decision to review and amend any aspect of registry services will

be detailed and prioritised through the Annual Operational Plan.

Other services

Organisational Services and the Office of the Chief Executive will provide the legal, IT and data management expertise, and media and communication support to deliver on the National Deepwater Plan. It can be expected that the demand for these services will be less frequent than for services from other Ministry business groups and that the exact nature of these services will vary between Annual Operational Plans. For example, service requirements might include Communications Team support to develop publication material to assist stakeholder engagement, or a comprehensive legal review and advice on a particular management option proposed for a single fishery.

From a generic viewpoint these services will likely take the following form:

External communications:

- Preparing media information and public briefing documents to ensure management activity is transparent (see MO 1.6)
- Providing media support around sustainability and management decisions.

Legal: Providing expert knowledge and legal opinion on the interpretation of the relevant fisheries legislation to support policy development and management interventions.

IT: Ensuring the Ministry's data and information systems are structured so as to maximise the Ministry's data holdings to inform management measures and to enable timely monitoring of at-sea activity.

Information management group:

- Providing regular data downloads to support developing management options
- Providing regular information downloads to enable monitoring of management measures and to assess fisher behaviour and performance
- Ensuring the correct data are collected through updating existing forms or developing new ones.

Future stakeholder engagement

Fisheries 2030 recognises the importance of good governance as a tool to deliver on outcomes. Equally stakeholders, in developing the management objectives for this plan, identified transparent management as critical to ensuring stakeholders understand and have confidence in the management regime.

This section describes an approach to provide for stakeholder engagement during the implementation of the National Deepwater Plan. This approach recognises that engagement should be focused and meaningful, and that with limited resources the Ministry must be smart in how it chooses to engage.

In addition to tangata whenua and two stakeholder groups have been identified as having a priority interest in New Zealand's deepwater fisheries; environmental NGOs and commercial quota owners.

Although some deepwater fisheries have nominal recreational allowances in place, these allowances are typically set at zero or are only a small proportion of the TAC e.g. in 2010 the hoki fishery had a TAC of 110,000 tonnes with a recreational allowance of 20 tonnes. Recreational views were not sought during the development of the National Deepwater Plan but the recreational sector will be involved in aspects of the implementation of the plan when it is apparent that a management issue is of importance to the recreational sector.

Tangata whenua:

The Ministry has agreed that fisheries plans are key to successfully implementing the Fisheries Treaty Strategy. This will be achieved by setting out how regard will be given to kaitiakitanga and by describing how input and participation requirements will be met. The key mechanism to achieve this is through the development and implementation of IFPs and FFPs.

IFP/FFP will be key tools for ensuring tangata whenua have effective input and participation at the appropriate levels of fisheries management decision making. IFP will provide for input from individual iwi and hapu at a local level by communicating individual iwi objectives that reflect their commercial and non-commercial fisheries interests. FFP will help neighbouring iwi to bring together their commercial, non-commercial and other fisheries goals at a scale that can communicate effectively and influentially with Crown decision making.

IFPs/FFPs that incorporate deepwater fisheries have not yet been developed and until this occurs an alternative approach to deliver on our Treaty strategy obligations is proposed. This interim approach is based on two assumptions:

1. Although the intention is to provide for full iwi engagement in the management of our deepwater fisheries there will be a focus on providing for commercial iwi engagement in the first instance. This assumption acknowledges that all but one iwi own deepwater quota and to date their interest has been in maximising the return from this asset normally through participating in the annual ACE market. This assumption also acknowledges that it is also available for iwi to choose how they wish to engage and this choice may mean a preference to engage at a non-commercial level.
2. The majority of deepwater fisheries have zero customary allocations set. IFPs will be the mechanism by which customary interests in deepwater fisheries will be specified

including the need for additional or increased customary allowances. Through the Treaty Partnership and Fisheries Management customary teams MFish will ensure iwi have every opportunity to input into and participate in the subsequent development of management measures to support customary interests.

IFPs/FFPs will likely be developed during the five year period of this plan. In the short term the Annual Operational Plan will be the mechanism by which the objectives specified in IFPs will be considered for delivery. IFPs and FFPs will be more fully integrated into the National Deepwater Plan when it is reviewed and revised for the next five year period starting in 2015-16.

Based on the above assumptions, and in the absence of IFPs and FFPs, the process to meet our input and participation obligations for deepwater fisheries will be achieved by:

1. Working with TOKM to encourage iwi groups to join and participate in the DWG. To date 12 iwi companies are members of the DWG.
2. Supporting TOKM to engage with those iwi groups where the limited size of their deepwater quota portfolio means that either membership or active participation in the DWG is not feasible. This could be achieved by formalising an arrangement where TOKM is nominated to engage with the Ministry on behalf of such iwi groups with respect to implementing the National Deepwater Plan. This support will also take the form of preparing and distributing communication and briefing material to provide iwi with updates on aspects of progress towards implementing the plan and meeting objectives.
3. Provide an opportunity for iwi to input into both the Annual Operational Plan and Annual Review Report through regular presentations at the relevant iwi forum.
4. Ensure iwi have the opportunity to input into annual sustainability and regulatory rounds as part of section 12 consultation requirements.

Environmental stakeholders:

MFish is proposing that environmental stakeholder interests in New Zealand's deepwater fisheries will be best provided for through the creation of an Environmental Advisory Group (EAG). It is proposed that this group is an open access forum which meets no less than quarterly to discuss issues relating to the delivery of the National Deepwater Plan and wider issues around the management of New Zealand's fisheries. This forum will also be the mechanism to provide for eNGO input into the delivery of conditions on any Marine Stewardship Council certified (or other third party certification initiative) deepwater fishery. It will be the forum by which eNGOs can monitor and assess the performance of this plan through ensuring that deepwater fisheries are performing against environmental standards and that both the operational and management objectives are being met.

The purpose of the EAG, including terms of reference and structure, will be developed in collaboration with eNGOs but it is expected to provide the opportunity for eNGOs to participate in high-level collaborative engagement on the management of deepwater fisheries. Once agreed the EAG will also be linked to the MOU between MFish and the commercial quota owners.

Commercial quota owners:

The majority of commercial quota owners of the species that will be managed through the National Deepwater Plan are represented by the DWG Ltd.

In 2006 MFish and the DWG (on behalf of deepwater quota owners) formed a collaborative partnership to manage New Zealand's deepwater fisheries. This partnership was given effect through a Memorandum of Understanding (MOU) signed by the Chief Executive of MFish and the Chair of the DWG.

The overarching purpose of this collaborative partnership is to increase the value New Zealand obtains from its deepwater fisheries by improving management, reducing duplication of effort and resources, reducing inefficiencies in processes, and reducing business costs for both parties.

In the intervening four year period this collaborative arrangement has delivered real benefits to deepwater fisheries management. These include a closer working relationship supported by real-time open communication and information sharing.

During this period the MOU has been revised to reflect changes in the management approach and the maturation of the partnership. The current revision of the MOU will prescribe the informal governance arrangements that have developed around the management of deepwater fisheries during the last four years. It will recognise that successfully implementing the National Deepwater Plan is the joint responsibility of the Ministry and industry, and both parties must co-operate to solve problems. Neither group has all the knowledge required to solve complex and dynamic problems, has access to all instruments needed to move in the desired direction, nor is able to unilaterally control all other participants.

The day to day management of deepwater fisheries will continue to be a collaborative initiative with the DWG under the National Deepwater Plan which will ensure that industry and Ministry resources are targeted at common objectives.

The MOU does not in any way affect section 12 consultation requirements that are set out in the Fisheries Act 1996. Rather, it establishes how we can ensure more efficient and effective engagement with the commercial sector in a more structured and managed forum before the formal consultation phase.

Finally, certain species included in the National Deepwater Plan, such a barracouta and alfonsino, will continue to be represented among commercial fishers through the inshore commercial stakeholder organisations (CSOs). As the fishery-specific chapters for these species are developed and implemented, the relevant CSOs will be encouraged to engage in the process.

Recreational Fishers:

Although recreational fishing is only a small component of the deepwater fisheries sector there are certain fisheries where recreational fishers have an active interest in how these fisheries are managed. These include the hoki and squid fisheries. To account for this interest MFish will ensure that the recreational sector is involved in key management decisions through:

- section 12 consultation on all sustainability decisions
- being provided an opportunity to review the draft Annual Review Report and Annual Operational Plan.

Appendix 1: Profile of New Zealand's deepwater fisheries sector

This section provides an overview of the management, economic and social context within which the deepwater fisheries sector currently operates.

Fisheries management context

In many countries, fisheries are used as an instrument of regional economic development, a component of the national or regional cultural identity, and/or a means to maintain employment and income in marginal areas or among workers with fewer transferable skills. This has led to management systems in which government retains control over access and allocation of fisheries, to ensure that these economic, social and cultural agendas can be promoted.

By contrast, New Zealand's commercial fisheries are managed with a full individual transferable quota (ITQ) system (quota management system (QMS)), giving security of tenure to quota owners, and considerable flexibility to structure business operations. Few of the objectives stated in the paragraph above are present in New Zealand. Overall, when compared internationally, the New Zealand government generally exercises less direct influence on the business decisions of fishing companies.

The role of government in fisheries management is currently best specified in the Fisheries Act 1996. Put simply it is to provide for the utilisation of New Zealand's fisheries while ensuring sustainability.

Although there is less government involvement in comparison to fisheries regimes internationally, New Zealand's deepwater fisheries are a highly regulated industry in comparison to other domestic primary production sectors. This means that changes to any of the laws, regulations, rules or policies relating to the harvesting, production, processing, preparation, distribution, packaging or labelling of deepwater fisheries products can have a significant business impact. There is an extensive collection of notices, orders, and regulations under the Fisheries Act alone that condition fishing activities – and there are a range of other non-fisheries rules under legislation governing labour, general environment, protected species, food safety, etc.

Economic context

The focus of deepwater and middle-depth fisheries is on commercial utilisation and profit maximisation. In inshore fisheries limiting commercial utilisation may provide for customary and recreational sectors to extract additional value from the resource. In contrast, if deepwater fisheries are not commercially fished in a sustainable manner then the value will likely be lost.

Within the deepwater sector the key revenue driver is export earnings and the limiting factors are fishing and export costs; which include government levies, fuel prices, cost of quota and processing costs.

The long term asset value of deepwater fisheries resources is assessed annually based on the value of quota from this sector. Quota value represents the perceived future value of the fishery to the sector. Factors that can influence this asset value include the long-term

sustainability of the resource and the ability of the fisheries management regime to support economic development in the fisheries sector. Trends in asset value provide an indicator of how well the management of the fisheries resource is contributing to long-term value.

Export earnings

New Zealand is a small producer, supplying less than 1% of global seafood production and less than 2% of global seafood trade.

However, the New Zealand seafood sector is the fifth largest exporting sector in the New Zealand economy. Total export revenues in 2009 from deepwater fisheries were $650 million. International markets provide over 90% of total revenues for the sector as there is a limited domestic market for these species.

Five of the ten largest export-earning fisheries are deepwater species. These five species (hoki, hake, ling, squid, orange roughy and jack mackerel) alone accounted for over $360 million in export earnings (2009).

New Zealand is generally a price-taker in the global seafood commodity market, and supplies a relatively small proportion in each export category. Even for orange roughy, where New Zealand supplies the majority of the world market, New Zealand's influence on price is limited, due to the possibility of product substitution with other seafood products in the same market niche.

Quota value

The capital worth of fish stocks (value of the fishing quota asset) can be estimated using quota trades (and in some cases ACE trades). The QMS provides a comprehensive source of market information, and quota trade analysis can provide an estimate of the environmental asset value of all QMS fish stocks.[15] This is available in the Fish Monetary Stock Account 1996 to 2008 produced by Statistics New Zealand. The asset value for the key deepwater and middle depths species has increased by 25% over the past ten years, despite the decline in the hoki catch, and is currently estimated to be $1,929m.[16]

[15] The United Nations System of Integrated Environmental and Economic Accounting (SEAA) framework advises that wherever possible, market values should be used to estimate natural capital.

[16] Evaluating total asset value over time for all deepwater stocks is not a useful measure – as stocks entered into the QMS their quota acquired an asset value. Therefore the increase in value overall is in part a reflection of adding species, not an increase in the value of the existing asset base. Eight of the ten key deepwater stocks have asset values dating back to at least 1986; SBW started in 2000, and scampi in 2004.

Table 2: Quota Asset value for key deepwater species for 2004 – 2009 ($million)

Species	2004	2005	2006	2007	2008	2009
Hake	147.3	123.4	187.7	141.0	156.9	135.5
Hoki	695.0	541.0	626.8	692.8	729.6	814.6
Jack Mackerel	99.5	58.0	27.0	26.5	27.6	53.6
Ling	195.6	219.5	196.9	231.4	247.9	246.2
Orange roughy	324.4	299.7	276.9	250.3	319.2	282.0
Oreo	67.5	67.5	72.3	84.6	86.5	74.4
Scampi	*	115.7	124.9	117.1	118.4	132.3
Southern blue whiting	52.3	58.6	62.0	52.8	63.7	74.3
Squid	240.3	137.9	297.5	169.6	95.3	116.5
Total	**1,822**	**1,621**	**1,872**	**1,766**	**1,845**	**1,929.4**

This asset value reflects the anticipated income stream from fishing quota taking into account a range of relevant factors, including market conditions, costs, resource availability, quality of the fishing right, TACC changes etc.

This quota value estimate provides a useful indicator to assess trends in economic value in the major deepwater species.

Fleet configuration

The fleet that operates in the deepwater fishery consists of a mixture of trawl and long-line vessels, domestic and foreign chartered vessels and factory trawler and fresher vessels. Approximately 45 vessels operate in the fleet.

The majority of the fishing activity is undertaken by trawl vessels using a combination of bottom and mid-water trawl nets. There is also a long-line fleet that fishes for ling and a developing pot fishery for deepwater crabs.

New Zealand companies are permitted to use foreign charter vessels beyond the territorial sea, and many companies avail themselves of this option. Operating costs are often lower than New Zealand vessels, due to reduced crew and vessel maintenance costs, and most of the operators in the deepwater sector include foreign charter vessels in their fleet mix. Currently vessels are sourced from Japan, Korea and the Ukraine.

Most charter vessels can only produce the simplest commodity forms (typically headed and gutted frozen product). Therefore these vessels tend to focus on bulk, low unit value fisheries, such as southern blue whiting, jack mackerel and squid, with some seasonal activity in other fisheries such as hoki and silver warehou. Although these vessels typically fish to a foreign flag they are still required to abide by the requirements of the Fisheries Act 1996 and all associated management measures.

A review of the operation of foreign charter vessels in New Zealand's EEZ took place in 2008. The outcome of this review has resulted in a comprehensive vessel registration process, increased observer coverage, formal standards addressing on-board conditions for observers and new measures to address issues with crew pay and conditions. All foreign charter vessels are now also required to pass a safety inspection by Maritime New Zealand prior to being registered.

Government costs

There are no government subsidies available to the New Zealand deepwater fishing sector, and some governance costs (including around 95% of the research costs) are recovered directly from the commercial fishing industry. Government currently cost recovers approximately $20 million from the deepwater sector per year (from a total of $31m across all sectors).[17]

The situation in New Zealand is in marked contrast to many overseas countries where many international competitors receive direct subsidies or cost-reducing transfers.

Third party certification

Supermarket chains in the USA and Europe are publicly committing themselves to 'responsible' sourcing policies for food generally and seafood products are at the forefront of this strategy. This has led to requests or requirements for independent certification to confirm that fish are sourced legally from well-managed and sustainable fisheries. At present the Marine Stewardship Council's standard dominates the independent certification market.

The financial return from environmental certification, particularly in terms of increased market prices, remains uncertain. However, it is increasingly apparent that third party certification is becoming the minimum standard for entry into certain markets.

New Zealand hoki was certified in 2001, and was recertified in 2007. Three further deepwater and middle-depth species will progress through MSC certification during 2010: hake, ling and southern blue whiting.

Achieving third party certification is an acknowledgement that the fisheries management regime in place across New Zealand's deepwater fisheries can successfully meet international standards.

Environmental context

Deepwater environmental issues grow more prominent year by year. Issues of particular prominence include:

- target stock sustainability;
- impacts of fishing methods on benthic ecosystems;
- finfish bycatch – particularly for species not managed under the QMS;
- incidental captures of endangered, threatened and protected species;
- the effect of deepwater fishing activity on wider ecosystem functioning including trophic linkages; and
- the use of spatial tools such as marine reserves, marine mammal sanctuaries and Marine Protected Areas to address environmental concerns.

The role of eNGOs in highlighting areas of concern regarding the impact that fishing may be having on the marine environment has encouraged industry to work proactively with

[17] This includes Department of Conservation levies.

government to manage environmental impacts outside the legislative framework. Successful initiatives include the recent Benthic Protection Area closures, efforts to reduce sea lion interactions in the squid fishery and seabird capture mitigation through vessel management plans.

Social and cultural context

In addition to the commercial fishing industry there are other stakeholder groups and interested parties that have a role in determining how New Zealand's deepwater fisheries are managed.

Māori fishing interests

Iwi representation in New Zealand's deepwater fisheries is largely through the Deed of Settlement allocation of quota. Through this allocation many iwi now own significant portions of quota across the deepwater stocks. This quota is rarely fished directly by the iwi group but generates income through the annual sale of ACE. Any iwi group that owns quota shares in a deepwater stock is eligible to become a member of the DWG Ltd. In addition their interests are represented through TOKM which also has representation on the DWG board.

One of the key challenges facing iwi quota owners is how to effectively manage the annual income stream from their quota while maintaining the value of their asset over the long term. To address this challenge iwi should be encouraged to take an active interest in the state of their fisheries, how they are managed and who is operating on their behalf. The DWG, with MFish support, is actively working with TOKM to assist iwi quota owners in this area.

Recreational interests

There is little recreational fishing effort associated with New Zealand's deepwater fisheries. Where recreational harvest has been known to occur, recreational allowances are made as part of the TAC and TACC setting process but these allowances are only a small proportion of the total allocation and only occur in a few deepwater fisheries – in 2010 the hoki fishery had a commercial allocation of 110,000 tonnes while the recreational and customary allocations were only 20 tonnes apiece.

Recreational fishers are not considered a significant stakeholder group with respect to deepwater fisheries management.

Environmental organisations interests

A number of eNGO groups take an active interest in the management of New Zealand's deepwater fisheries. These groups provide:

- Issue awareness - bringing forward issues not yet of broad public concern, but that may require proactive management attention
- Technical expertise on key environmental issues (such as ecological expertise).

New Zealand eNGOs involvement in deepwater fisheries management issues takes a number of forms, including structured involvement in government stakeholder groups, working directly with industry on an informal basis and campaigning to raise public awareness. The majority of the input is providing perspective on issues, raising awareness, or providing a view on which course of action a decision-maker should adopt. They have also been actively

involved in the development of the management objectives included in this National Deepwater Plan.

New Zealand eNGOs tend to be subscription-based (members self-identify by joining the organisation and/or making financial contributions) rather than endowment-based. As a result these groups have limited resources and engagement is selective in terms of focusing on high profile environmental issues (e.g. sea lions), or by participating in processes were the overarching management framework is determined (e.g. in developing environmental standards).

Appendix 2: 10 Year Research Programme

A summary of the key components of the 10 Year Research Programme is presented below.

Trawl surveys form a key part of stock assessment research. They often provide the most accurate information on stock abundance and each survey can monitor multiple target and bycatch fish stocks; information is also provided about incidental bycatch. However, trawl surveys are expensive and are most appropriate when they provide information for a range of high and medium value stocks. The 10 Year Research Programme includes the following trawl surveys:

- Chatham Rise survey, including extending the survey into deepwater strata. This trawl survey is scheduled for delivery in eight of the next 10 years.
- Sub-Antarctic survey. This survey will be conducted annually initially and then in alternate years. Consideration was given to extending the depth range of this survey, both shallower and deeper, but the additional information that would have been provided did not justify the additional expense.
- A new trawl survey is scheduled for the West Coast South Island. This will be conducted in each of the first four years to establish baseline information and then conducted every second year so as to alternate with the sub-Antarctic survey.
- A trawl survey has also been identified for orange roughy (ORH MEC).
- Additional trawl surveys may also be required depending on the efficacy of new acoustic surveys that are planned under the 10 Year Research Programme.

Acoustic surveys

Acoustic surveys provide a cost-effective alternative to trawl surveys and can be used to assess stock biomass. Acoustic surveys are most effective when fish form single species schools, usually during spawning aggregations (e.g. southern blue whiting), and those fish are readily seen and identified using acoustic equipment.

The 10 Year Research Programme envisages that seven or eight acoustic surveys will be conducted in most years. MFish currently contracts about 2-3 acoustic surveys annually although additional surveys are delivered by industry through direct purchase arrangements. The current acoustic surveys conducted by industry for southern blue whiting (SBW6B), orange roughy (ORH3B) and hoki (Cook Strait) will continue. In addition to these surveys, trial acoustic surveys will be done for several additional stocks. Acoustic surveys have not previously been conducted for some of these stocks but information suggests that it is feasible to use this method to determine stock status.

Scampi camera surveys

Cameras attached to trawls are currently used to count scampi burrows and estimate stock size. The 10 Year Research Programme continues with this approach but will implement it as part of a wider and more formalised programme of camera surveys for the four main scampi fisheries. It is also proposed that the feasibility of using industry vessels to undertake this camera work be tested.

Catch sampling and otolith collection

A key element of the 10 Year Research Programme is full observer coverage across the deepwater and middle-depth fleet. Full observer coverage will result in significant additional information being obtained on length frequencies, fish sex and stage and age information

from otoliths. This information will be important for the stock assessments and characterisations discussed below. This catch sampling is particularly important for those stocks where trawl or acoustic surveys are not economic survey options.

Stock assessments and characterisations

Based on the information obtained from the trawl, acoustic and camera surveys, and the data collected by onboard observer sampling, stock assessments and characterisations will be conducted regularly on all major deepwater stocks. High volume/value stocks will have full stock assessments while low knowledge bycatch stocks will typically have regular stock characterisations. The sequencing of assessments and characterisations is timed to use the information collected in surveys conducted in preceding years. In most years under the 10 Year Research Programme 8-10 stocks will undergo a full stock assessment and 5-7 stocks will undergo characterisations.

Aquatic environment research

The majority of the deepwater aquatic environment research will be supported by observer monitoring of environmental impacts. The observer information will be used to produce an annual report on interactions with threatened, endangered and protected species across all deepwater fisheries. Full observer coverage on deepwater vessels will ensure this report is more comprehensive than current information. Other major aquatic environment research projects proposed include annual/frequent:

- Ecological risk assessments
- Monitoring of the trawl footprint
- Analysis of bycatch
- Taxonomic identification of benthic samples
- Analysis of ecosystem indicators.

Additional research

The 10 Year Research Programme does not envisage that all research required to manage deepwater fisheries will be specified up front. As such, the 10 Year Research Programme has some built-in flexibility by way of a discretionary fund to reflect the possibility that additional research will be required in most years. This fund can also be used to manage cost over-runs, although long term contracting should limit this necessity.

For example, the discretionary fund may be used to conduct additional research into mitigating bird captures should a fishery breach the relevant environmental standard. Similarly, additional research may also be commissioned to respond to a concern about the sustainability of a fish stock, to investigate new ways to conduct stock assessment research or to review management strategies. In essence the discretionary research pool will be used if any of the stock specific objectives require further research.

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

September 2010

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

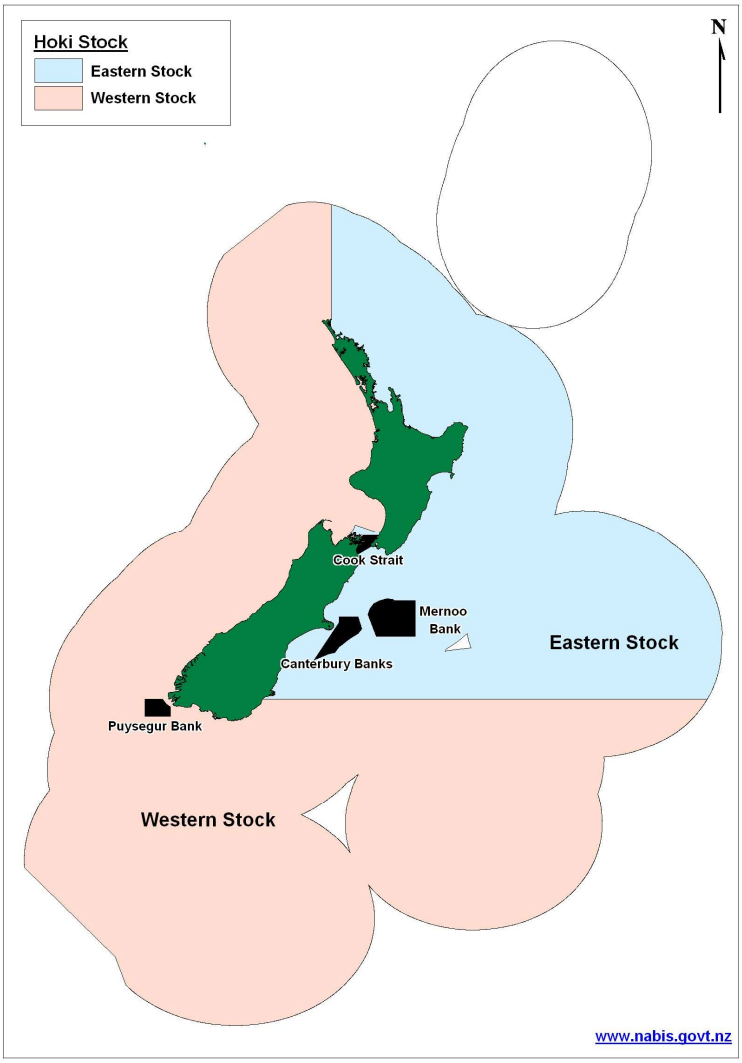
Summary Five year actions for the hoki fishery	Single/ Multiple year or Annual delivery	Start	Expected delivery date
Actions to contribute to the Environment Outcome: The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future 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**

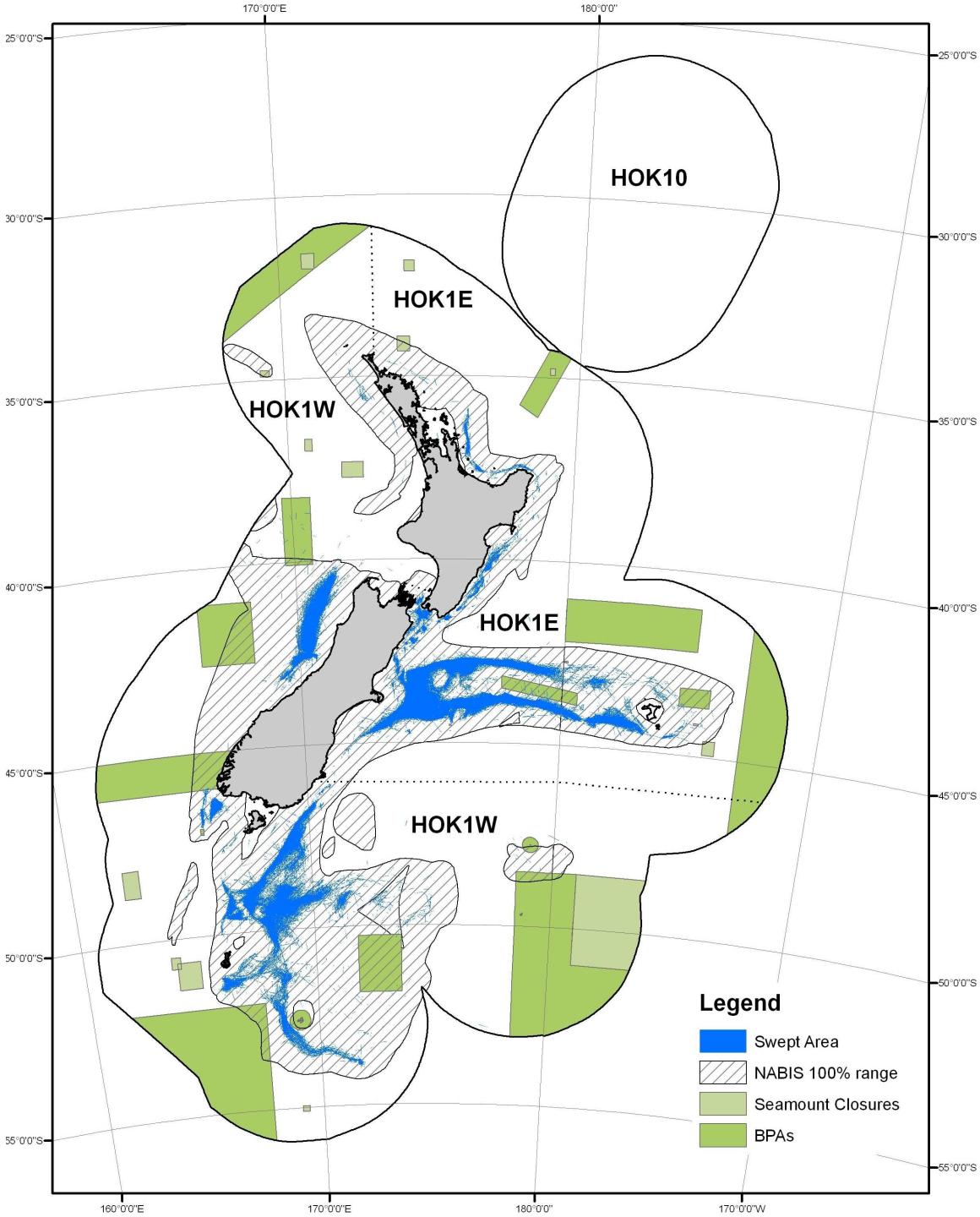
In recent years the management measures to address the effects of deepwater trawl activity have focused on 'avoiding' these effects rather than remedying or mitigating them (as per the requirements under the Fisheries Act to avoid, remedy or mitigate). This has been achieved by closing areas to bottom 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.

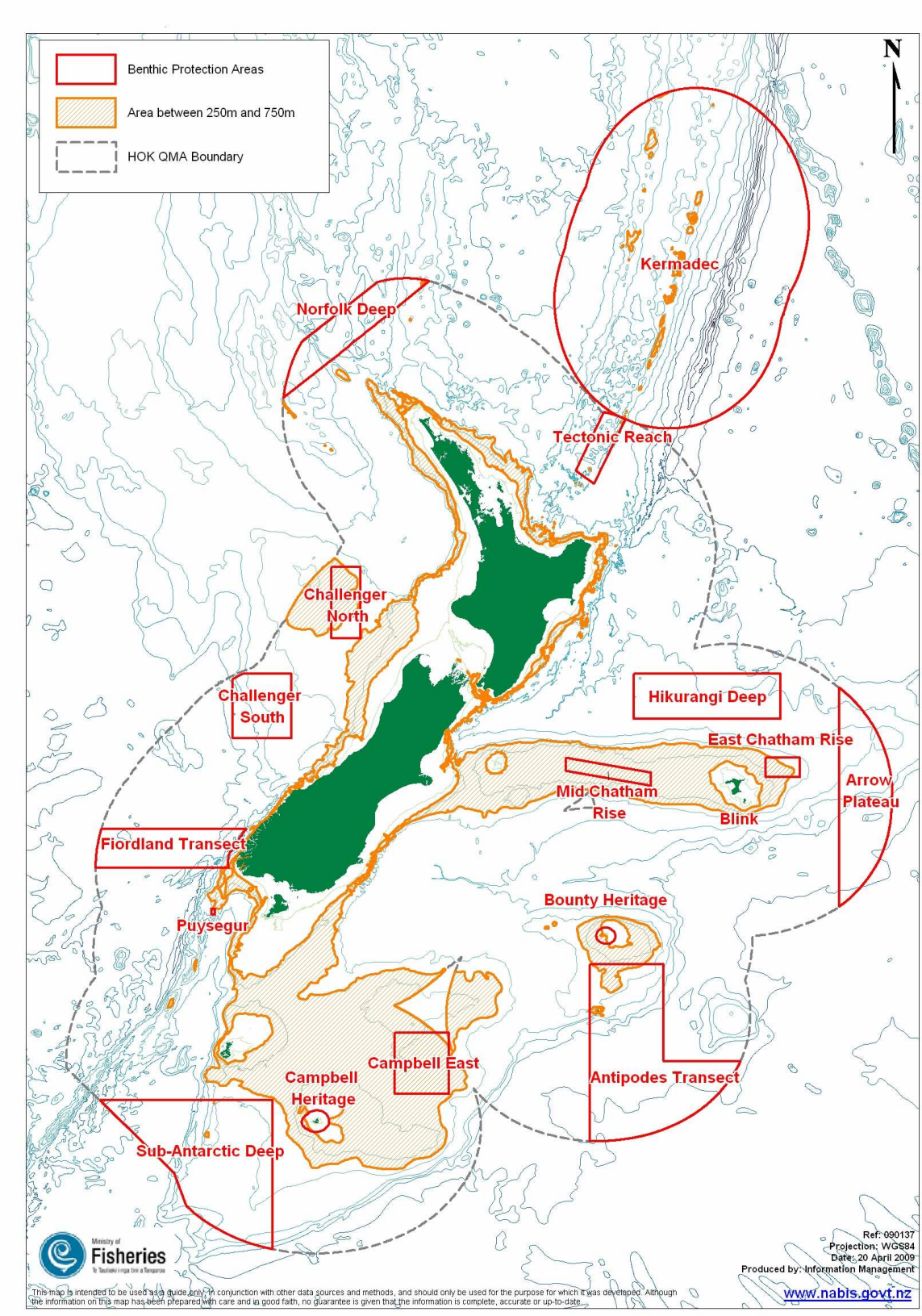
considered.[9] The maps below detail the BPAs and also include details of the hoki habitat depth range.

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"

Orange roughy
FISHERIES PLAN

February 2010

Introduction

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

- Orange roughy (target)
- Black cardinalfish (target)

It also addresses the management of any adverse environmental effects caused by fishing these species.

Oreo species (smooth oreo, black oreo, spiky oreo and warty oreo), which can be a significant bycatch of orange roughy, are not included in this chapter as they constitute significant target fisheries in their own right. A separate oreo chapter will be developed for these species.

This chapter consists of the following sections:

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

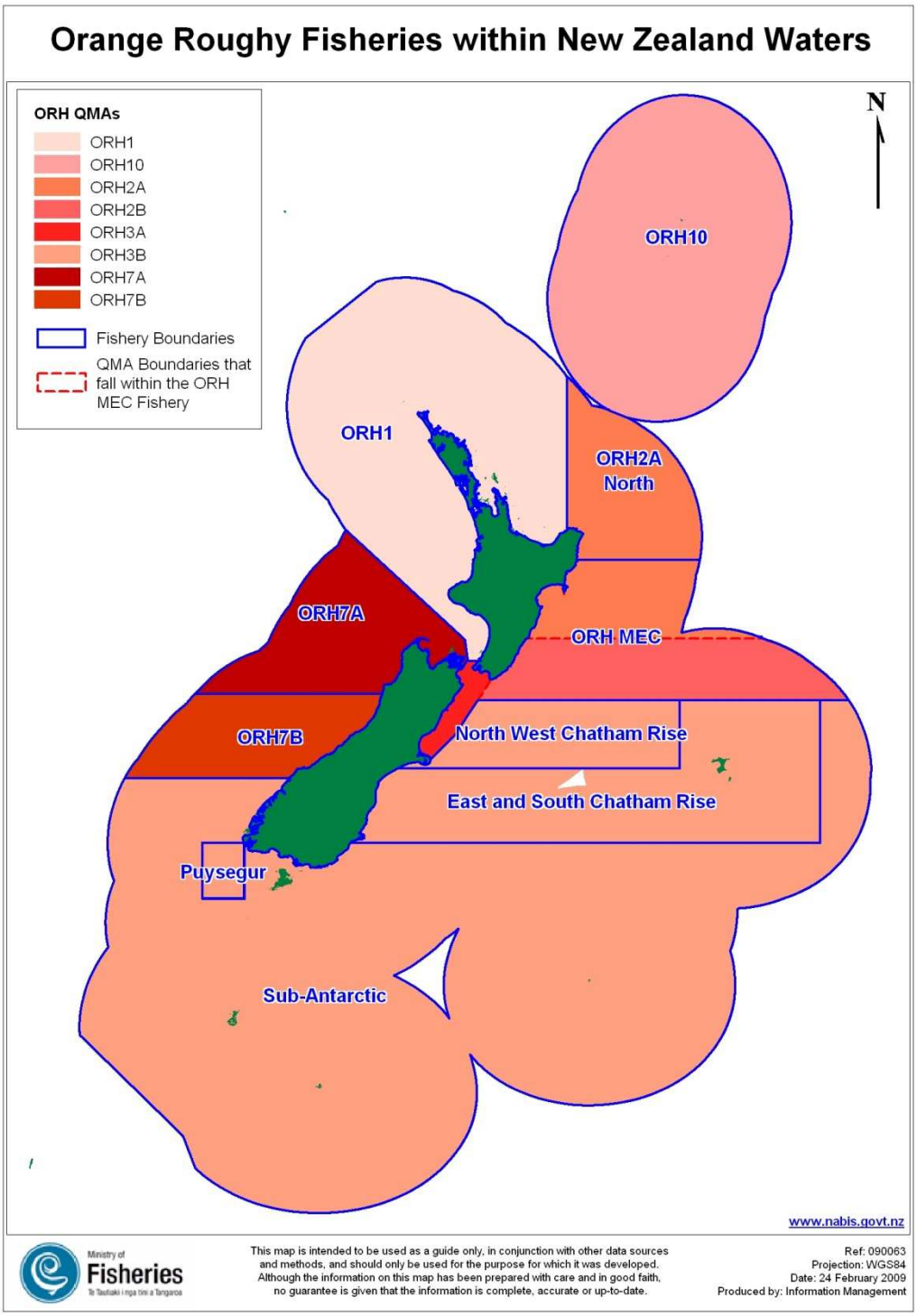
Summary Five year actions for the orange roughy fishery	Single/ Multiple year or Annual delivery	Start	Expected delivery date
Actions to contribute to the Use Outcome: Fisheries resources are used in a manner that provides greatest overall economic, social, and cultural benefit			
1. Develop and implement a programme to maximise economic yield from all orange roughy fisheries	Multiple	2010	2011
2. Develop and implement a cost/benefit evaluation process to assess proposed management interventions in the orange roughy fisheries	Multiple	2010	2011
3. Develop and implement a revised Memorandum of Understanding with the DeepWater Group Ltd (DWG)	Single		2010
4. 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
5. Only utilise research to inform the management of orange roughy fisheries that has met the requirements of the Research Standard	Annual	2011	2015
6. Annually assess the performance of orange roughy fisheries against the regulatory regime through a series of compliance benchmarks	Annual	2011	2015
7. Establish an Environmental Advisory Group, in collaboration with environmental stakeholders, to provide for ENGO engagement on the management of deepwater fisheries including orange roughy	Single		2010
8. Increase iwi participation in deepwater fisheries management, including orange roughy, through membership of the DWG (target of 70% of iwi represented by the DWG, either directly or indirectly, from 2013)	Multiple	2010	2014
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			
9. Information on the performance of orange roughy fisheries against compliance benchmarks is reported in the Annual Review Report, including details of actions taken when breaches have occurred	Annual	2011	2015
10. Complete and implement harvest strategies across all orange roughy fish stocks	Single	2010	2014
11. Complete and implement a harvest strategy for all cardinalfish fish stocks	Single	2011	2014
12. Produce annual reports documenting the performance of the catch spreading arrangements across the orange roughy fisheries	Annual		2011
13. Annually review the deemed value rates for orange roughy and cardinalfish stocks and amend as necessary	Annual	2011	2015

14. Complete an Ecological Risk Assessment (ERA) for orange roughy and cardinalfish fisheries	Single		2011
15. Develop a policy position on what is meant by "habitats of particular significance for fisheries management purposes" with respect to orange roughy fisheries	Single		2012
16. Assess the extent of existing protection measures in ensuring habitats of particular significance for orange roughy fisheries management are adequately protected	Single		2013
17. Ensure the orange roughy fishery is managed so that it fully meets the requirements of the Seabird Standard and NPOA from 2011*	Multiple	2011	2012
18. Implement a monitoring regime to improve the quality of data on bycatch species (non-QMS) caught in orange roughy fisheries	Single		2011
19. Use the results from the ERA to implement a management programme (regulatory/non-regulatory) to manage any adverse effects of orange roughy fishing on shark species, in line with environmental standards	Annual	2013	2015
20. Use the results from the ERA to implement a management programme (regulatory/non-regulatory) to manage any adverse effects of orange roughy fishing on endangered threatened and protected (ETP) species, in line with environmental standards	Multiple	2012	2013
21. Complete a qualitative risk assessment for the non-QMS bycatch species caught in the orange roughy fishery	Single		2012
22. Produce a map of the extent of the orange roughy trawl grounds annually	Annual	2011	2015
23. Assess the extent of the orange roughy trawl grounds against the revised Benthic Optimised Marine Environment Classification	Single		2011
24. Ensure all orange roughy fisheries are managed so that they fully meet 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 orange roughy fisheries

Figure 1. Map of the orange roughy fisheries within the New Zealand EEZ *(Note that the Northwest Chatham Rise, East and South Chatham Rise, Puysegur and the Sub-Antarctic fisheries combine to form the ORH 3B Quota Management Area (QMA); and the ORH MEC fishery is made up of the southern part of the ORH 2A QMA and the entire ORH 2B and ORH 3A QMAs.)*



Biology overview

Orange roughy *(Hoplostethus atlanticus)* is widespread in New Zealand waters, occurring in all areas of the upper continental slope at depths between 700 and 1,500m. It reaches a maximum size in New Zealand waters of about 50 cm (standard length) with an average size of around 35 cm.

Orange roughy are a very slow-growing and long-lived species, and are believed to reach an age of 120-130 years. In New Zealand orange roughy is estimated to reach sexual maturity between 23 and 31 years of age, and become vulnerable to fishing at 15-20 years of age.

Spawning occurs once every year, between June and early August in many separate locations within the New Zealand Exclusive Economic Zone (EEZ). The location and timing of spawning demonstrates there are multiple stocks around New Zealand. Spawning fish form dense aggregations at depths of 700-1,000m in areas often associated with bottom features such as hills and canyons. It is likely that individual orange roughy do not spawn every year and fecundity is relatively low.

Additional aggregations form outside the spawning period, presumably for feeding. The main prey includes mid-water and bottom species (prawns, fish and squid).

For more information on the biology of orange roughy see the current Ministry of Fisheries Plenary Report at www.fish.govt.nz

Fisheries management overview

Orange roughy stocks within the New Zealand EEZ are managed under the Quota Management System (QMS). The statutory management target is to maintain stocks at or above the biomass that will support the Maximum Sustainable Yield (B_{MSY}).

Orange roughy are the focus of an important deepwater fishery in New Zealand, and have been fished for over 30 years. The first orange roughy fishery developed on the Chatham Rise in 1979, followed by new grounds being located on the Challenger Plateau, off the east coast (Wairarapa, Kaikoura, Ritchie Banks), and Cook Canyon in the mid 1980s, and Puysegur Bank, East Cape, and Bay of Plenty in the early 1990s.

There are now nine distinct orange roughy fisheries within the New Zealand EEZ (Figure 1). The boundaries of the ORH 1, ORH 7A and ORH 7B fisheries align with Quota Management Area (QMA) boundaries. The ORH 2A North fishery is the northern portion of the ORH 2A QMA, with the southern portion linking with the ORH 2B and ORH 3A QMAs to form ORH Mid-East Coast (MEC). ORH 3B is comprised of fisheries developed on the Chatham Rise (the largest historical fishery, the East and South Rise and the smaller NW Rise fishery) and in the Sub-Antarctic area.

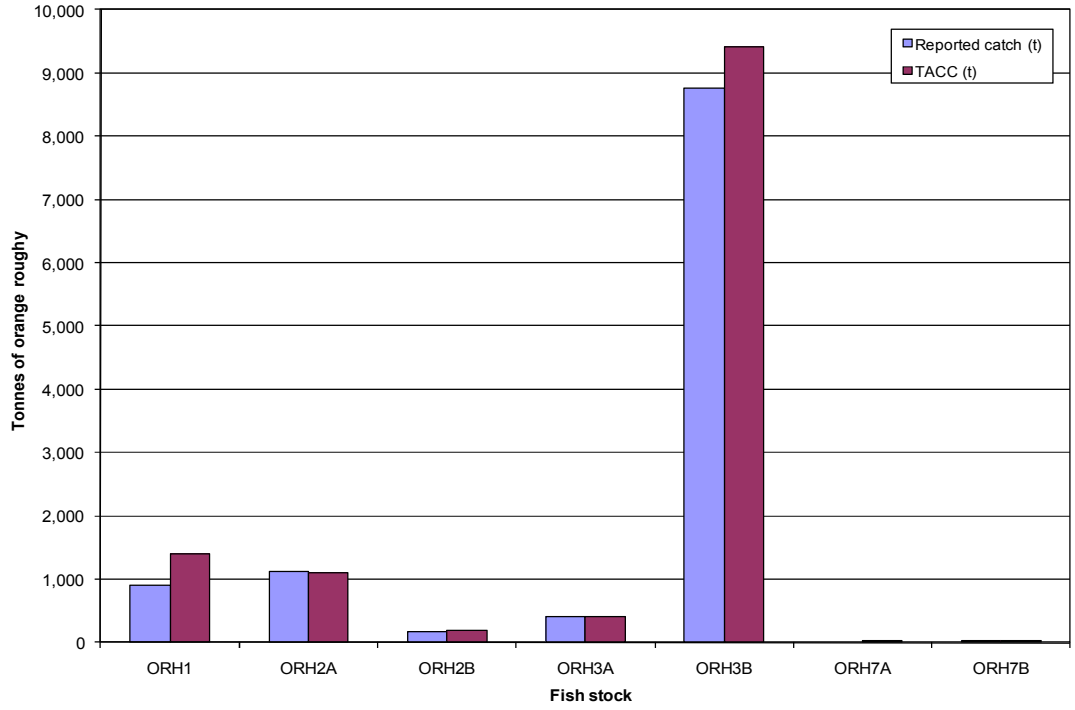
The separate fisheries are managed independently with each having an agreed catch limit. Statutory catch limits in the form of total allowable catches (TACs) and total allowable commercial catches (TACCs) are set for each QMA. Where a fishery boundary aligns with the boundaries of a single QMA the catch limit is the TACC. Catch limits for the other orange roughy fisheries are set by agreement between the industry and Government by splitting TACCs into area limits along the accepted fisheries boundaries within QMAs. Figure 2 shows the reported catch and TACCs for all orange roughy fisheries by QMA for the 2008-09 fishing year.

The deliberate management strategy in the early years of most fisheries managed under the QMS is to reduce the stock down to the most productive size. This level is the biomass that can support the maximum sustainable yield (MSY). During the initial fish-down phase, catches are higher than are

sustainable over the long term. Once the fish-down is complete and the stock size is reduced down to the biomass that will support the MSY (B_{MSY}), a lower annual catch is implemented to maintain the stock size at this level. Generally, as the stock is progressively fished down, catch limits are decreased. In circumstances where the biomass is estimated to have been reduced below B_{MSY}, catches are set at levels below the MSY in order to rebuild the stock.

The size of the total fishery was relatively steady at about 40,000-50,000t during the 1980s but started to decrease in the 1990s with reductions in TACCs as the fishing down phase was completed in the major stocks.

Figure 2. Reported catch and TACC for orange roughy stocks in the 2008-09 fishing year



Orange roughy quota owners are represented through the DeepWater Group Ltd (DWG), the commercial stakeholder organisation responsible for the key EEZ fisheries. In 2006 the Ministry of Fisheries and DWG signed a Memorandum of Understanding (MOU) which set out how both DWG and MFish would work collaboratively to improve the management of deepwater fisheries, including orange roughy. The objectives of this collaborative arrangement include:

1. An improved working relationship with industry (open and collaborative dialogue);
2. Enabling collaborative work to develop better quality policy advice including the development of the National Deepwater Plan;
3. Greater information sharing to ensure optimal solutions are developed for management issues;
4. Improved (informed) compliance; and
5. Improved environmental management and mitigation across key areas such as seabirds.

Environmental overview

Orange roughy fishing activity is known to interact with the wider marine environment including:

1. benthic organisms associated with deepwater features such as hills and canyons as well as a wide variety of substrate types.
2. incidentally captured finfish species
3. incidentally captured shark species

Where these interactions are determined to be adverse, management intervention is required to minimise the severity of the impact. A key focus of this fisheries plan is to ensure that adverse effects are avoided and minimised and that all interactions are monitored 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 orange roughy, are operating at a level above that which is required by the standard. Although it is not possible to assess if individual orange roughy fisheries have 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.

Additional information on the extent of environmental interactions in orange roughy target trawl fisheries is discussed later in this chapter.

Economic overview

Commercial orange roughy fishing began in New Zealand on the Chatham Rise in the late 1970s - early 1980s with fisheries in other parts of the New Zealand EEZ typically starting in the mid 1980s. Catches peaked in the late 1980s and have decreased since, largely in response to reductions in catch limits as the biomass of the various stocks has been fished down to target levels.

Three individual companies own approximately 80% of all orange roughy quota. These three companies are the principal operators in the ORH 3B fishery and are also significant quota owners in ORH MEC. Two other companies are dominant in the ORH 1 and ORH 2A North fisheries. The orange roughy fleet predominantly consists of domestic vessels with large factory trawlers predominant in the Chatham Rise and sub-Antarctic fisheries and smaller fresher vessels typically operating in other areas.

Orange roughy quota across all fisheries was estimated to be worth $282m as at 30 September 2009.[1] In 2009, 4,093 tonnes (processed weight) of orange roughy was exported realising a value of $51m. The majority of orange roughy is exported as frozen fillets with 82% of this product exported to the USA and 12% to Australia. In 2009 1,228 tonnes (processed weight) of orange roughy was exported to China for further processing.

Orange roughy has featured unfavourably on "best fish guide' lists produced by environmental NGOs. The stated intent of these lists is to advise consumers on how to make environmentally responsible fish purchases and they have resulted in orange roughy products no longer being stocked by some retailers. The reason for the unfavourable assessment is primarily due to the perception that orange roughy stocks generally are overfished; that bottom trawling fishing methods have an unacceptable impact on the deepsea benthic communities; and that management does not adequately address these issues. The Ministry of Fisheries does not support this perception.

[1] From the Fish Monetary Stock Account, 1996-2009 produced by Statistics New Zealand.

Compliance overview

Orange roughy fisheries are subject to a number of compliance requirements aimed at improving the management of these fisheries – including their effect on bycatch and related species. The following compliance risks have been identified as being of particular relevance to orange roughy fisheries and these are described in more detail below:

1. Area misreporting
2. Misreporting catch
3. Fishing in closed areas

Area misreporting

Area misreporting occurs when catch caught in one quota management area (QMA) is incorrectly reported as caught in another. The primary motive behind this type of offence is to minimise the cost of acquiring Annual Catch Entitlement (ACE) or paying deemed value charges.

Misreported catch

Catch misreporting occurs when incorrect weights, quantities, species, or landed states are reported. As with area misreporting, the primary motive behind this type of offence is to minimise the cost of acquiring ACE or paying deemed value charges.

Fishing in closed areas

Areas are closed to orange roughy fishing by regulation under the benthic protection area (BPA) initiative and the seamount closures.

MFish strives to minimise the opportunity for these and other types of offending to occur through careful risk analysis of the orange roughy fisheries with cooperative input from industry. Information sharing between MFish and industry allows MFish to adapt compliance efforts to current risks and will also help to develop and monitor performance against the compliance standards and benchmarks necessary to achieve many of the goals within this plan.

Social and cultural overview

The Fisheries Act (1996) (the Act) requires that, prior to setting management measures for orange roughy stocks, 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 that (s)he considers relevant.

Social and cultural factors include those related to the harvesting of orange roughy itself. There is little to consider in this regard as orange roughy is not taken by either recreational or customary fishers and there is no allowance made for recreational or customary take within the orange roughy TACs.

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

Overview by fishery

The following sections provide a timeline of key developments in each of the individual orange roughy fisheries within the New Zealand EEZ (Figure 1). A graph of catch over time is included for each fishery.

ORH 1

The ORH 1 region extends northwards from west of Wellington around to Cape Runaway. Prior to 1993–94 there was no established fishery, and reported landings were generally small. The fishery first developed in winter 1994, when aggregations were fished on two hill complexes in the western Bay of Plenty. In 1996 catches were also taken off the west coast of Northland. From 2000 the QMA was split into four sub-areas and catch is spread across the QMA. The fishery was managed under an Adaptive Management Plan from 1995-2000 and again from 2001 to 2007.

Time line of key developments

1986 TACC of 10 tonnes established with varying levels of additional exploratory catch allowance provided up until 1989.

1989 TACC increased to 190 tonnes but catches remain small.

1994 Fishery developed on two hill complexes in the Western Bay of Plenty. Research fishing undertaken under Special Permit (i.e. additional to TACC).

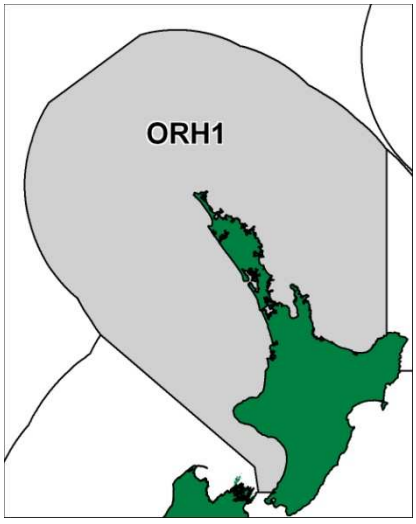
1995 5 year Adaptive Management Programme (AMP)[2] introduced for the area known as the 'Mercury-Colville Box'. TACC increased to 1,190 tonnes, 1,000 tonnes of which was to come from the 'Mercury Colville Box'. Additional research fishing undertaken under Special Permit.

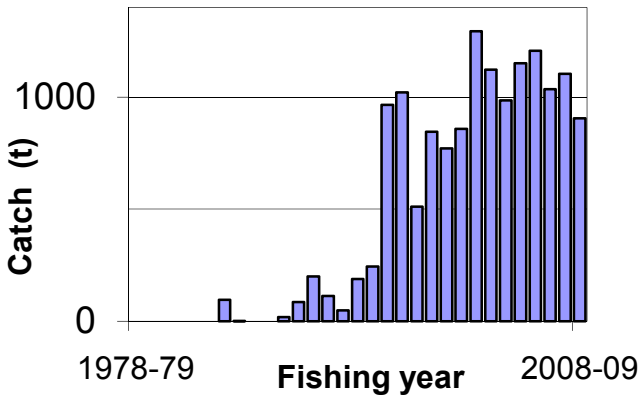
1996 Special Permit granted for exploratory fishing allowing additional 880 tonnes to be taken from designated areas and within designated feature limits.

2000 AMP concluded and TACC reduced to 800 tonnes. QMA split into 4 areas (A-D) and catch limited to 200 tonnes within each area and 100 tonnes from individual features.

2001 New AMP initiated. TACC increased to 1,400 tonnes.

2007 AMP ceased but quota owners agreed to continue to adhere to sub-area and feature limits established under the AMP.





[2] An AMP involves increasing TACCs for a limited period of time to improve the understanding of stock status. Improved understanding comes through obtaining a stronger signal of the effect fishing is having on a stock and also from additional reporting and information gathering requirements that form part of an AMP agreement with industry.

ORH 2A North

ORH 2A North (also known as the 'East Cape') covers the northern portion of the ORH 2A QMA and has been managed and assessed independently from the MEC stock since 1995. Up until 1999-2000 annual landings in the fishery ranged from 1,500 to 3,400 tonnes, with very little of the catch coming from outside the East Cape hills area. The catch limit was decreased sharply from 2,500 to 200 tonnes in 2000-01, restricting landings from this fishery to low levels in recent years.

Time line of key developments

1995 Fishery managed and assessed independently from the remainder of the ORH 2A QMA.

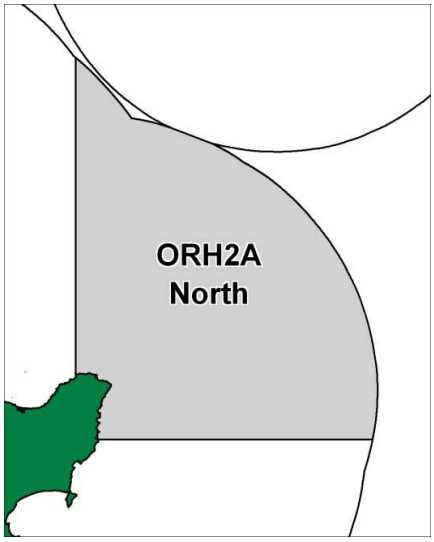
1996 ORH 2A North fishery split by voluntary agreement with quota owners with separate catch limits agreed for the East Cape hills and an exploratory area comprising the remainder of ORH 2A North.

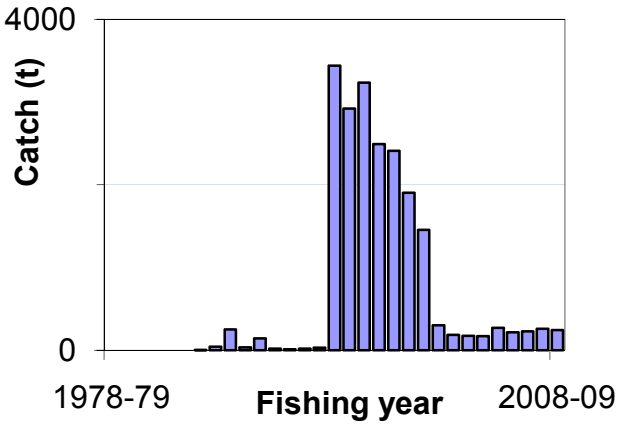
2000 Catch limit decreased from 2,500 to 200 tonnes. Agreement to split catch established in 1996 lapsed, and subsequent landings from the fishery as a whole have been low.

2002 Catch limit for ORH 2A as a whole reduced to 680 tonnes but industry agreed to retain 200 tonne limit for ORH 2A North.

2004 Catch limit for ORH 2A as a whole increased to 1,100 tonnes but industry agreed to retain 200 tonne limit for ORH 2A North.

2004-2009 200 tonne catch limit for ORH 2A North exceeded every year





ORH Mid East Coast (MEC)

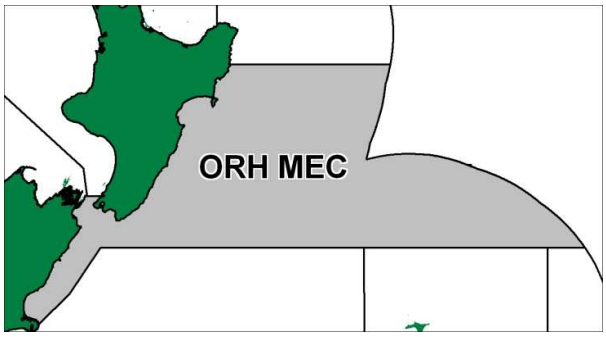
The development of a fishery in the East Cape led to a voluntary agreement to manage the ORH MEC fishery (covering the southern portion of the ORH 2A QMA, the ORH 2B and the ORH 3A QMAs) separately from the ORH 2A North fishery.

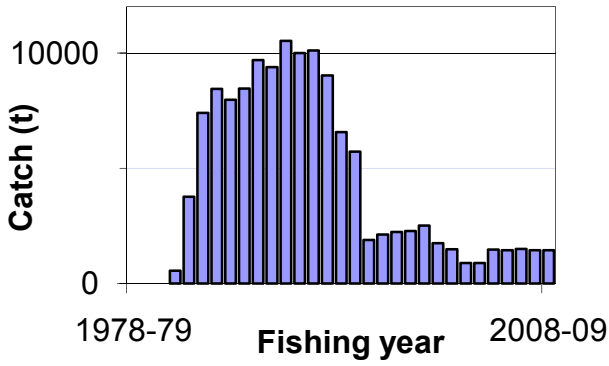
Catch peaked at over 10,000 tonnes in the early 1990s and has been relatively constant since the mid-1990s.

The main spawning area for the fishery is understood to be on the Ritchie Bank with smaller spawning events located in Wairarapa (ORH 2B South) and in Kaikoura (ORH 3A).

Time line of key developments

- *1989* First reported landings with the development of the Wairarapa fishery.
- *1993* A major change took place in the ORH 2A fishery with a shift of effort from the main spawning hill on Ritchie Bank to hills off East Cape.
- *1994* Voluntary agreement to manage the southern portion of ORH 2A in conjunction with ORH 2B and ORH 3A as the Mid-East Coast (MEC) fishery. Catch limit for MEC set at 6,660 tonnes.
- *1995* Catch limit for MEC reduced to 2,100 tonnes
- *2000* Catch limit for MEC reduced to 1,500 tonnes
- *2002* Catch limit for MEC reduced to 800 tonnes
- *2004* Catch limit for MEC increased back to 1,500 tonnes based on new stock assessment information





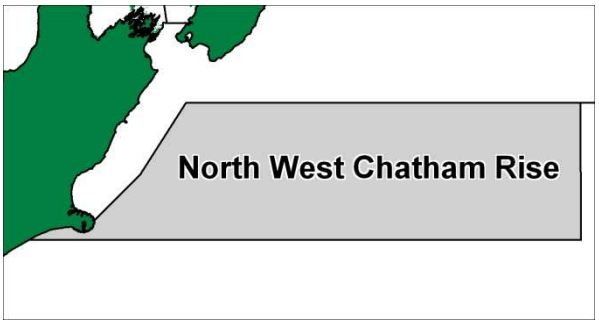
Northwest Chatham Rise

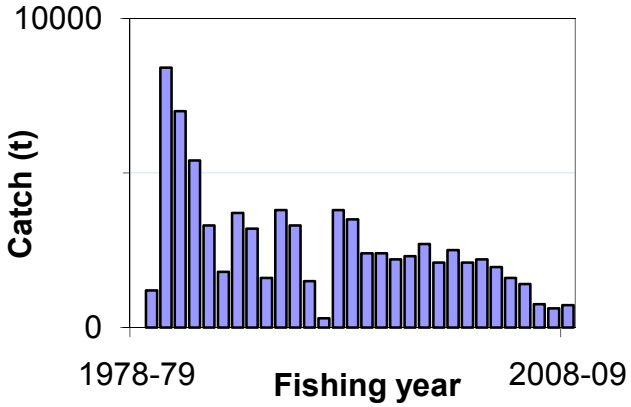
A catch limit specific to the Northwest Rise component of ORH 3B has been in place since 1992 and has been progressively decreased from 3,500 tonnes to its current level of 750 tonnes.

The fishery is focussed on a complex of hills referred to as the Graveyard, located on the 180^{o} longitude line. The Graveyard spawning plume typically forms during mid-late June and dissipates in mid July. Outside the spawning season, orange roughy form aggregations for feeding, but these are less consistent than those formed for spawning. One of the Graveyard Hills (the Morgue) was closed to all fishing as part of a series of seamount closures established in 2001 to protect benthic biodiversity.

Time line of key developments

- *1979* First reported catch from the Northwest Chatham Rise.
- *1980* Annual catch peaked at over 8,400 tonnes.
- *1992* ORH 3B TACC split into voluntary catch limits managed under a voluntary arrangement with the fishing industry, limiting catch to 3,500 tonnes.
- *1995* The fishery now focused on spawning aggregations of orange roughy found on the Graveyard hills complex.
- *2000* Catch limit reduced to 2,000 tonnes
- *2004* Catch limit reduced to 1,500 tonnes
- *2006* Catch limit reduced to 750 tonnes





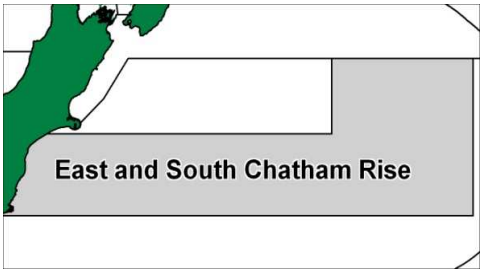
East and South Chatham Rise

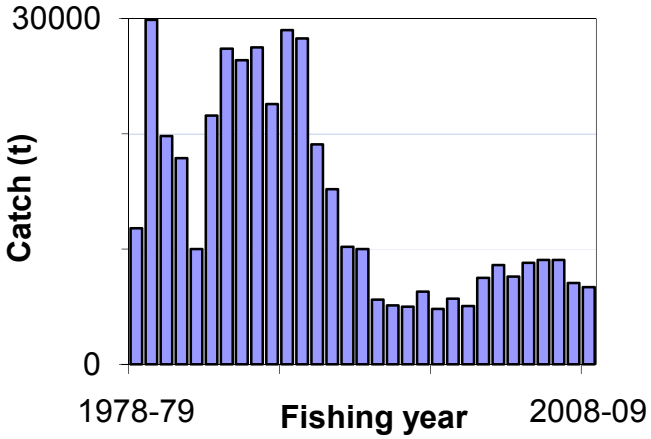
The oldest and largest orange roughy fishery in the world is located on the East and South Chatham Rise (ESCR), a discrete orange roughy stock that is one of several that make up the ORH 3B QMA. Targeted orange roughy fishing on the East and South Chatham Rise occurs year-round on flat ground and on underwater hill features.

Orange roughy on the East and South Chatham Rise spawn in June and July. Spawning is known to occur on many of the hill features located in this area but the dominant spawning aggregations form over a flat area of seafloor to the north of the Chatham Islands. The nature of the seafloor and the overwhelming dominance of orange roughy during the spawning period in this area have allowed successful and repeatable acoustic biomass surveys to be undertaken.

Time line of key developments

1970s	Fishery commenced in the late 1970s.
1988	Annual catch peaked at over 30,000 tonnes.
1992	ORH 3B TACC split into voluntary catch limits managed under a voluntary arrangement with the fishing industry.
1998	Acoustic survey series of the spawning plume started and have been undertaken annually by the same vessel from 2002
2007	Accepted stock structure altered and the Northeast Chatham Rise and the South Chatham Rise combined to form a single management area (East and South Chatham Rise).
2007	Three year phased introduction of an F_{MSY}-based harvest strategy initiated, such that F will equal F_{MSY} [3] for the 2011-12 fishing year
2008	Catch limit reduced to 6,570 tonnes
2009	Catch limit reduced to 5,100 tonnes
2010	Catch limit reduced to 2,960 tonnes





[3] F_{MSY} is the fishing mortality rate that, if applied constantly, would result in an average catch corresponding to the Maximum Sustainable Yield (MSY) and an average biomass of B_{MSY}.

Sub-Antarctic

Stock structure in the Sub-Antarctic region is not known. Fisheries have developed progressively throughout this area as fishers have moved from one fishery to another over the last 20 years.

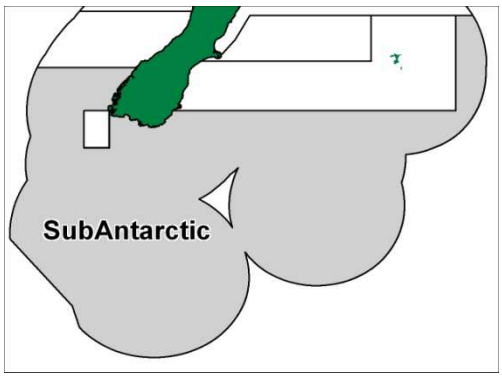
In 1995–96, large catches were reported on the southeast Pukaki Rise, with a catch total of over 3,000 tonnes. However, the catches dropped rapidly, and within a few years the fishery had effectively ceased.

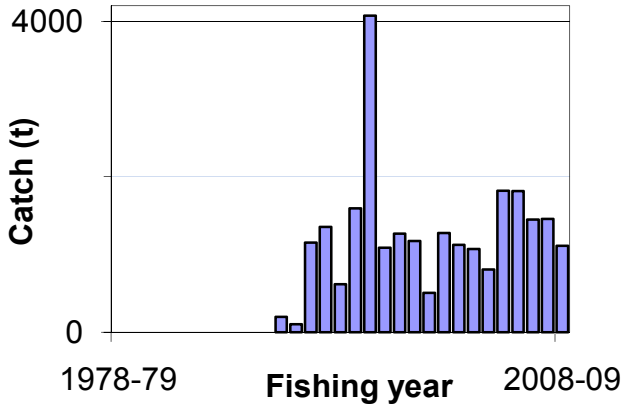
Catches of orange roughy have also been taken off the Bounty Islands (around 200 tonnes per year since 1997–98), off the Snares Islands (up to around 500 tonnes, but infrequently in recent years), areas of the Macquarie Ridge (100–500 tonnes per year since 2000–01), and off Fiordland (around 500 tonnes in 2000–01, but catches then rapidly decreased).

In recent years, a fishery has developed on the northeast Pukaki Rise, and includes the area known as Priceless. This area now dominates the Sub-Antarctic orange roughy catch. Catches are mostly taken at the start of the fishing year, and have reached the feature limit of 500 tonnes for each of the last 5 years.

Time line of key developments

1990	Exploratory fishing undertaken for orange roughy in the Sub-Antarctic
1992	ORH 3B TACC split into voluntary catch limits managed under a voluntary arrangement with the fishing industry
1993	Auckland Islands fishery developed
1994	Catch from the Auckland Islands fishery peaked at around 900 tonnes
1995	SE Pukaki fishery commenced
1999	Catch dropped to less than 200 tonnes and is now infrequent
2001	Fishery developed on NE Pukaki Rise, including the area known as Priceless. Sub-Antarctic catch limit reduced to 1,300 tonnes
2006	Sub-Antarctic catch limit increased to 1,850 tonnes
2010	Catch limit reduced to 500 tonnes



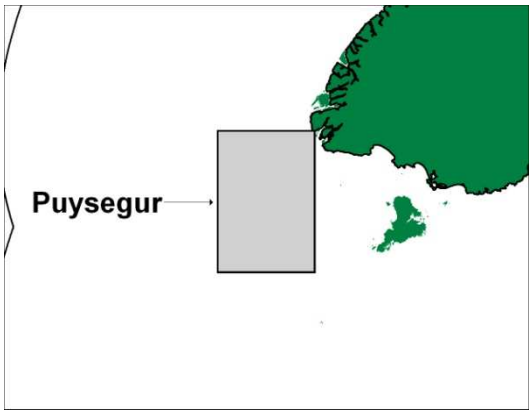


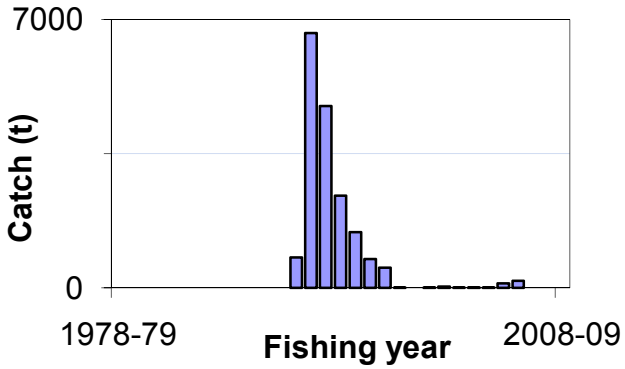
Puysegur

The first fishery to be developed south of the Chatham Rise was on Puysegur Bank in 1990–91. The fishery developed rapidly, but from 1993–94 catch limits were substantially under-caught. Catch limits were subsequently reduced with industry agreeing to a self-imposed closure in the 1997–98 fishing year.

Time line of key developments

- *1990* Exploratory fishing discovered spawning aggregations and rapid development of the Puysegur fishery ensued
- *1992* ORH 3B TACC split into voluntary catch limits managed under a voluntary arrangement with the fishing industry. Catch limit of 5,000 tonnes established for Puysegur
- *1993* Catch limit for Puysegur substantially under-caught
- *1994* Progressive annual reductions in catch limit initiated
- *1997* Fishery closed by industry agreement
- *2004* Industry research survey undertaken
- *2005* Industry research survey undertaken
- *2010* Fishery reopened with catch allowance of 150 tonnes



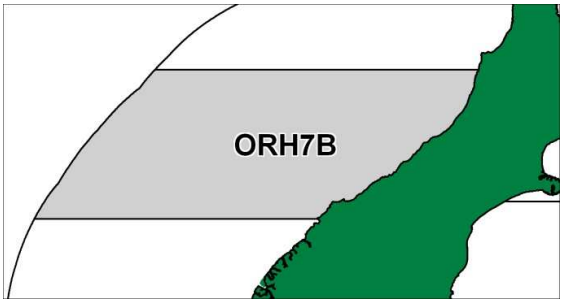


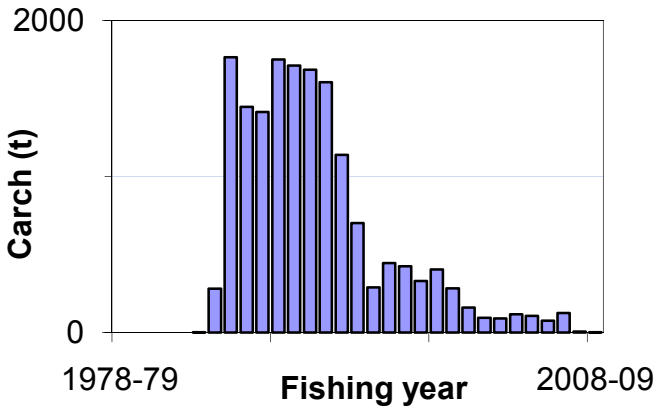
ORH 7B

The fishery was centred on an area near the Cook Canyon, which is a trench running out from the west coast of the South Island in roughly an east-west direction. Fishing also occurred to the south around the Moeraki Canyon.

Time line of key developments

- *1985* Fishery first developed
- *1986* Rapid development when aggregations of spawning orange roughy were targeted in winter.
- *1993* Catches began to decline well below the TACC of 1,708 tonnes.
- *1996* TACC reduced to 430 tonnes.
- *1998* Catches began to decline well below the TACC of 430 tonnes.
- *2001* TACC reduced to 110 tonnes.
- *2007* Fishery closed by Minister of Fisheries (TACC reduced to 1 tonne).





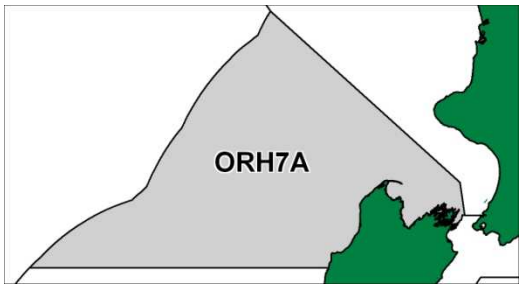
ORH 7A

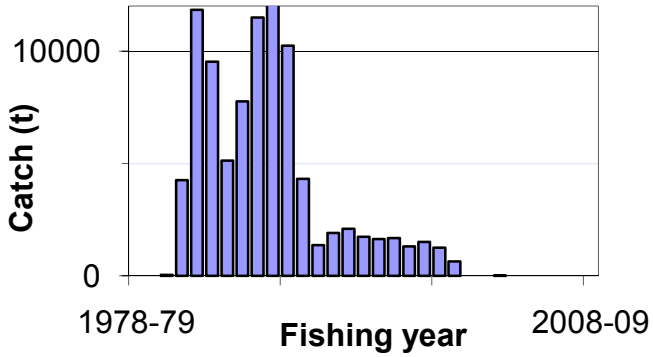
The orange roughy fishery in ORH 7A commenced in the early 1980s in the southwestern region of the Challenger Plateau. Catches increased rapidly in 1982-1983 with the discovery of spawning aggregations. The fishery occurred both within and outside the EEZ and based on scientific evidence it has been managed as a single, straddling stock.

An experimental management approach was adopted in the 1980s to test the productivity of the stock, and to this end, the TAC was progressively increased to a peak of 12,000 tonnes in 1987-88. By 1990-91, stock assessments estimated the stock had been fished down to below B_{MSY} and the TAC was reduced to 1,900 tonnes, a level that was believed would support stock rebuilding. A new stock assessment in 2000, estimated a much lower biomass, and the fishery was closed to fishing from 1 October 2000 (with a TACC of 1 tonne), to promote stock rebuilding.

Time line of key developments

1981	Fishery first developed
1982	Spawning aggregations found and rapid development of the fishery
1984	4,950 tonne TAC established
1987	TAC increased to its maximum level of 12,000 tonnes.
1989	TAC reduced to 2,500 tonnes.
1990	TAC reduced to 1,900 tonnes.
1998	TAC reduced to 1,425 tonnes.
2000	Fishery effectively closed (TACC reduced to 1 tonne)
2004	Industry research survey undertaken
2005	Industry research survey undertaken
2009	Industry research survey undertaken
2010	Industry research survey undertaken
2010	Fishery reopened with a 500 tonne TACC





2. Overview of non-target interactions

This section describes in more detail the relevant non-target bycatch and incidental interactions and captures that occur in orange roughy fisheries (Table 1). 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 managed through a fisheries plan.

   Key bycatch species do not warrant a chapter of a fisheries plan in their own right, usually because they are taken as bycatch in a more valuable target fishery (e.g. silver warehou in the hoki fishery) or because they are targeted in conjunction with higher value species (e.g. black cardinalfish in the orange roughy fishery).

   In most cases key bycatch species taken in deepwater and middle depth fisheries will be managed under the National Deepwater Plan. However, key bycatch species that are predominantly inshore species will be managed through the relevant inshore fisheries plan.

   As a rule, species that account for at least 1% of the total catch weight in the orange roughy fishery will be managed as a key bycatch species of orange roughy. An exception will be made if catch is less than the 1% threshold but a stock is commercially important and there are valid reasons to include it in the orange roughy chapter.

   The only key bycatch species incorporated into the orange roughy plan is black cardinalfish.

   Note that several QMS species in Table 1 are important target species in their own right and will have their own chapter in the fisheries plan. These species are smooth oreo, black oreo, spiky oreo and warty oreo which will be managed through the oreo fishery specific chapter.

2. **Incidental bycatch species:** These are species with little or no commercial value that are rarely the focus of fishing effort and are usually discarded or rendered to fishmeal. They are typically non-QMS species that account for only a small proportion of the total fish harvested from the orange roughy target fisheries.

   The primary management approach for incidental bycatch species will be to actively monitor catch levels. If the annual catch of an incidental bycatch stock changes significantly, either up or down, then management intervention will be considered.[4]

3. **Incidental interactions with endangered, threatened and protected (ETP) species:** This category relates to the incidental interaction, capture or mortality of protected species such as seabirds and marine mammals.

4. **Benthic interactions:** This category includes benthic invertebrate species that are captured by, or that are known to interact with, orange roughy trawl gear.

Fish and invertebrate species taken as bycatch or incidental catch in the orange roughy fisheries over the last three fishing years are shown in Table 1. This information is derived from observer reports.

[4] The variation in reported catch of all non-QMS stocks is considered annually as part of the process detailed in the paper 'Identification candidate Stocks for QMS introduction – standards and organisational procedures'

The table is colour coded as follows:

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

Table 1: Catch weight by species name for the top 50 species caught as bycatch in orange roughy 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**
Orange roughy	6,349.8	90.8	5,976.9	78.5	5,026.9	74.7
Smooth oreo	236.3	3.4	915.4	12.0	971.8	14.4
Black oreo	22.9	0.3	111.4	1.5	181.5	2.7
Hoki	47.1	0.7	63.4	0.8	78.7	1.2
Rattails	43.3	0.6	62.5	0.8	45.9	0.7
Shovelnose dogfish	46.2	0.7	68.2	0.9	30.1	0.4
Deepwater sharks or dogfish (Unspecified)	18.7	0.3	46.3	0.6	66.7	1.0
Baxter's lantern dogfish	20.1	0.3	38.8	0.5	53.5	0.8
Slickhead	14.2	0.2	43.7	0.6	36.8	0.5
Morids	38.8	0.6	9.2	0.1	28.9	0.4
Johnson's cod	1.5	0.0	50.0	0.7	25.1	0.4
Longnose velvet dogfish	13.9	0.2	27.1	0.4	14.4	0.2
Seal shark	10.3	0.1	21.8	0.3	22.3	0.3
Warty squid	13.4	0.2	11.7	0.2	20.8	0.3
Black cardinalfish	7.5	0.1	10.4	0.1	25.7	0.4
Basketwork eel	9.3	0.1	12.0	0.2	12.6	0.2
Ribaldo	13.7	0.2	9.0	0.1	8.5	0.1
Long-nosed chimaera	3.8	0.1	15.0	0.2	11.7	0.2
Rocks / Stones	13.1	0.2	14.8	0.2	0.1	0.0
Javelinfish	8.6	0.1	14.9	0.2	4.4	0.1
Violet cod	0.2	0.0	14.1	0.2	10.0	0.1
Coral rubble	11.1	0.2	8.1	0.1	-	-
Spiky oreo	3.1	0.0	5.5	0.1	9.6	0.1
Bushy hard coral	7.3	0.1	7.4	0.1	-	-
Hake	2.4	0.0	3.9	0.1	4.4	0.1
Plunket's shark	0.2	0.0	3.9	0.1	5.9	0.1
Scleractinia	-	-	4.4	0.1	5.0	0.1
Pale ghost shark	1.5	0.0	3.2	0.0	2.3	0.0
Unicorn rattail	6.6	0.1	-	-	0.3	0.0
Alfonsino	1.6	0.0	3.1	0.0	1.9	0.0

	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**
Leafscale gulper shark	3.5	0.1	0.5	0.0	2.5	0.0
Etmopterus spp.	4.1	0.1	0.8	0.0	0.3	0.0
Smooth skin dogfish	1.5	0.0	2.0	0.0	1.5	0.0
Oreo	-	-	0.1	0.0	4.1	0.1
Caryophyllia spp.	-	-	4.0	0.1	-	-
Crested cup coral	-	-	3.5	0.0	-	-
Ridge scaled rattail	1.1	0.0	1.8	0.0	0.2	0.0
Brodie's king crab	1.1	0.0	0.9	0.0	1.2	0.0
Four-rayed rattail	-	-	-	-	2.8	0.0
Warty oreo	0.9	0.0	0.8	0.0	0.6	0.0
Pacific sleeper shark	-	-	1.0	0.0	1.3	0.0
Longnosed deepsea skate	0.3	0.0	1.6	0.0	0.4	0.0
Sea cucumber (other than *Stichopus mollis*)	0.5	0.0	1.4	0.0	0.3	0.0
Cat shark	0.8	0.0	1.1	0.0	0.3	0.0
Widenosed chimaera	1.4	0.0	0.2	0.0	0.2	0.0
Jellyfish (Unspecified)	0.0	0.0	1.4	0.0	0.3	0.0
Bollons rattail	0.0	0.0	1.5	0.0	0.0	0.0
Coral (Unidentified)	0.3	0.0	1.0	0.0	-	-
Toadfish	0.3	0.0	0.3	0.0	0.7	0.0
Shark (Unspecified)	0.3	0.0	0.0	0.0	0.8	0.0
Others	11.4	0.2	12.8	0.2	8.1	0.1
Totals	6,994.1		7,612.9		6,731.0	

Category 1: Key bycatch species

The following QMS stocks are included in the orange roughy chapter of the National Deepwater Plan:

- Black cardinalfish: CDL 1 - 9

Black cardinalfish do not meet the >1% threshold but as the main fishing areas for this species overlap with that of orange roughy, and black cardinalfish are targeted by vessels that also target orange roughy, it is appropriate to include these stocks within this fisheries plan chapter.

Future management of black cardinalfish will occur through this fisheries plan. A summary of the black cardinalfish fishery is provided below.

BLACK CARDINALFISH (CDL)

Biological Overview

Several species of *Epigonus* are widely distributed in New Zealand waters, but only black cardinalfish (*E. telescopus*) reaches a marketable size and is found in commercial concentrations. It occurs throughout the New Zealand EEZ at depths of 300–1,100 m, mostly in very mobile schools up to 150 m off the bottom over hills and rough ground.

The average size of black cardinalfish landed by the commercial fishery is about 50–60 cm and they reach a maximum length of about 75 cm. Research indicates that this species is relatively slow-growing and long lived.

Fisheries Management Overview

Black cardinalfish has been caught since 1981 by research and commercial vessels, initially as a bycatch of target trawling for other high value species. The preferred depth range of schools (600–900 m) overlaps the upper end of the depth range of orange roughy and the lower end of alfonsino and bluenose. The exploitation of these species from 1986 resulted in the development of the major cardinalfish fishery in QMA 2.

Black cardinalfish is primarily sold domestically due to the short shelf life of frozen fillets. The species has a section of dark flesh under the lateral line that has caused problems with overseas marketing. The fillets can be tainted if this flesh is not removed quickly.

Since 1982 more than 65% of annual black cardinalfish landings have come from the east coast of the North Island (QMA 2). The large increase in landings from this area in 1986–87 was associated with the development of the orange roughy fishery around the Ritchie Banks and Tuaheni High, and an increase in targeted fishing to establish a catch history when it was anticipated to become a quota management species. Landings from the Bay of Plenty (QMA 1) have fluctuated since 1988. The relatively large landings in 1990–91 were a combination of bycatch of the orange roughy fishery and target fishing for black cardinalfish. Between 1991–92 and 2005–06 occasional large catches were taken from outside the EEZ on the northern Challenger Plateau and the Lord Howe Rise.

Black cardinalfish was introduced into the QMS on 1 October 1998 along with a number of other low knowledge species. At that time TACs were set for CDL 2–8 on the basis of reported landings. Setting TACs for CDL 1 and 9 was deferred due to concerns that TACs based on current landings may not have been sustainable. From 1 October 2006, TACs were increased in CDL 4 from 5 to 66 tonnes and in CDL 5 to 22 tonnes. The new TACs were intended to better reflect the then current catch and were

established on the basis that there were no known sustainability concerns for these stocks. They were set at the average of the previous seven years' commercial catch plus an additional 10% to take account of the variability of the quantities harvested as the fishery developed.

The stock structure of black cardinalfish in CDL 2, 3 and 4 was considered in 2009 as part of a new stock assessment for these fisheries. The working group agreed that these three QMAs were likely to comprise a single stock. The stock assessment indicated that the stock had been reduced to low levels and as a result, the Minister decided to reduce the TAC for the CDL 2 (the largest fishery) fishery from 1 October 2009. The first cut of a 3-year staged reduction in TACC was implemented in October 2009 with the second reduction implemented in 2010. A pilot acoustic feasibility study was completed in early 2010. Although the results of survey are inconclusive a further feasibility survey is scheduled for early 2011.

Economic overview

- 65% of black cardinalfish quota in the main CDL 1 and 2 fisheries is held by three companies.
- Quota owners in CDL 1 and 2 are broadly similar to those in the orange roughy fisheries that overlap these QMAs.
- Black cardinalfish quota value was estimated to be $4.2m 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. The bycatch discard rate in orange roughy target fisheries is very low with approximately 94% of the greenweight catch in targeted orange roughy tows retained onboard.

A range of deepwater shark species account for a significant portion of the species taken as incidental bycatch in orange roughy fisheries and make up approximately 2% of the total observed catch.

Incidental bycatch species, including deepwater shark species, will continue to be monitored annually through the National Deepwater Plan. If catch levels are deemed to be impacting on the sustainability of a species, or if there are utilisation concerns, then incidental bycatch species will be considered for possible QMS introduction or other management measures may be implemented under section 11, such as catch limits, gear restrictions or closed fishing areas.

Category 3: Incidental captures of ETP species

New Zealand's orange roughy fisheries have low levels of interaction with seabird and marine mammal species. Table 2 below describes the extent of the seabird and marine mammal interactions based on MFish observer data from vessels targeting orange roughy for the period 1 October 2005 to 30 September 2008. All the observed seabird captures occurred in the East and South Chatham Rise fishery and all the marine mammal captures occurred in the Sub-Antarctic fishery.

Table 2: Extent of observed interactions with seabirds and marine mammals from the orange roughy trawl fisheries for the period 1 October 2005 – 30 September 2008.[5]

Fishing year	Seabirds		Marine mammals		Total number of tows	Observed tows	Percentage of tows observed
	Dead	Alive	Dead	Alive			
2007-08	1x Giant petrel	0	0	0	3686	1588	43.08%
2006-07	1x Gibson's albatross	0	1 x fur seal	0	3882	1152	29.68%
2005-06	2 x Buller's albatross	0	0	1 x fur seal	4477	778	17.38%

Seabirds:

Seabirds are infrequently caught during trawling for orange roughy. MFish observers have provided information showing that the seabird mortality rate associated with deepwater trawling is very low, at less than 0.01 seabird captures per tow. Seabirds that are killed or injured by trawl gear are either struck by the trawl warps (typically larger seabirds such as albatross) or caught in the net when it is on the surface during deployment and retrieval (typically smaller seabirds such as shearwaters or petrels). 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 across the deepwater and middle depth fleet generally.

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 on individual vessels.

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

[5] Abraham, E.R. (2009) Seabird and marine mammal captures in New Zealand deepwater fisheries. Report prepared for the Ministry of Fisheries. 6p.

Marine mammals:

Fur seals are occasionally, but infrequently, captured by vessels targeting orange roughy in the Sub-Antarctic. There have also been a small number of sea lion captures attributable to orange roughy trawlers operating in the vicinity of the Auckland Islands. Both the New Zealand fur seal and sea lion are protected species under the Marine Mammal Protection Act 1978.

As with seabird interactions, industry works to ensure all vessels over 28 metres in length follow a Marine Mammal Operating Procedure (MMOP) which is generic across the deepwater and middle depth fleet. The MMOP specifies measures that must be followed to reduce the risk to marine mammals and procedures to follow if a marine mammal is captured. The Ministry of Fisheries monitors and audits vessel performance against the MMOP.

There is no observer information to suggest interactions occur with other marine mammals such as dolphins or whales in orange roughy fisheries.

Protected shark species:

There are no known interactions with protected shark species.

Protected coral species:

An amendment to the Wildlife Act 1953 in July 2010 means that most hard coral species are now protected under that Act. Over the last three fishing years observers have reported over 50 tonnes of corals being taken in orange roughy target trawls.

Approximately 40% of such corals were reported under generic reporting codes, which means that it is not possible to confirm whether it was a protected species or not. Most of the remainder were hard corals and therefore are now protected under the Wildlife Act. Less than a 100kg of reported coral were species not protected under the Wildlife Act.

Category 4: Benthic interactions

Vessels targeting orange roughy use bottom trawl gear that is typically fished on the seabed. Contact of components of the trawl (doors, ground rope etc.) with the seafloor results in the capture of benthic invertebrates and impacts on both physical and biological components of the benthic habitat.

Table 3 below details the benthic bycatch that has been recorded from observed vessels targeting orange roughy over the past three fishing years. In addition to these invertebrates a total of 28,276 kg of substrate (including rocks, stones, sand and mud) was recorded by observers during this period.

Table 3: Benthic bycatch from orange roughy target tows from Observer records for 2006-07 to 2008-09 fishing year[6]

Phyla	Common name	Total amount recorded (kg)
Cnidaria	Corals (protected species)	32,734
	Corals (not protected species)	84
	Corals (generic reporting codes)	20,792
	Sea anemones	979
	Hydroids	9
	Sea pens	6
Echinodermata	Sea stars, brittle stars and sea urchins	2,258
	Sea cucumbers	2,392
Arthropoda	Crustacea (crabs, lobsters and barnacles)	4,686
Porifera	Sponges	1,394
Mollusca	Octopus	462
	Gastropods and bivalves	70

In recent years the management measures to address the effects of deepwater trawl activity have focused on avoiding these effects. This has been achieved though 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. It 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.[7]

The BPAs currently in place represent 16% of orange roughy habitat (based on orange roughy depth range), as detailed in Figure 4 below. The current BPAs will be reviewed after 2013 and if research suggests that the existing BPAs are not protecting an adequate and representative section of marine habitats then further closures will be considered.[8]

[6] Phyla with a total observed catch less than 10kg have been excluded

[7] The exception is 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.

[8] Some eNGOs do not consider that the Benthic Protected Area adequately address the benthic interactions that arise from trawling for orange roughy and other deepwater species.

Figure 3: Orange roughy bottom trawl footprint 1989-90 to 2007-2008

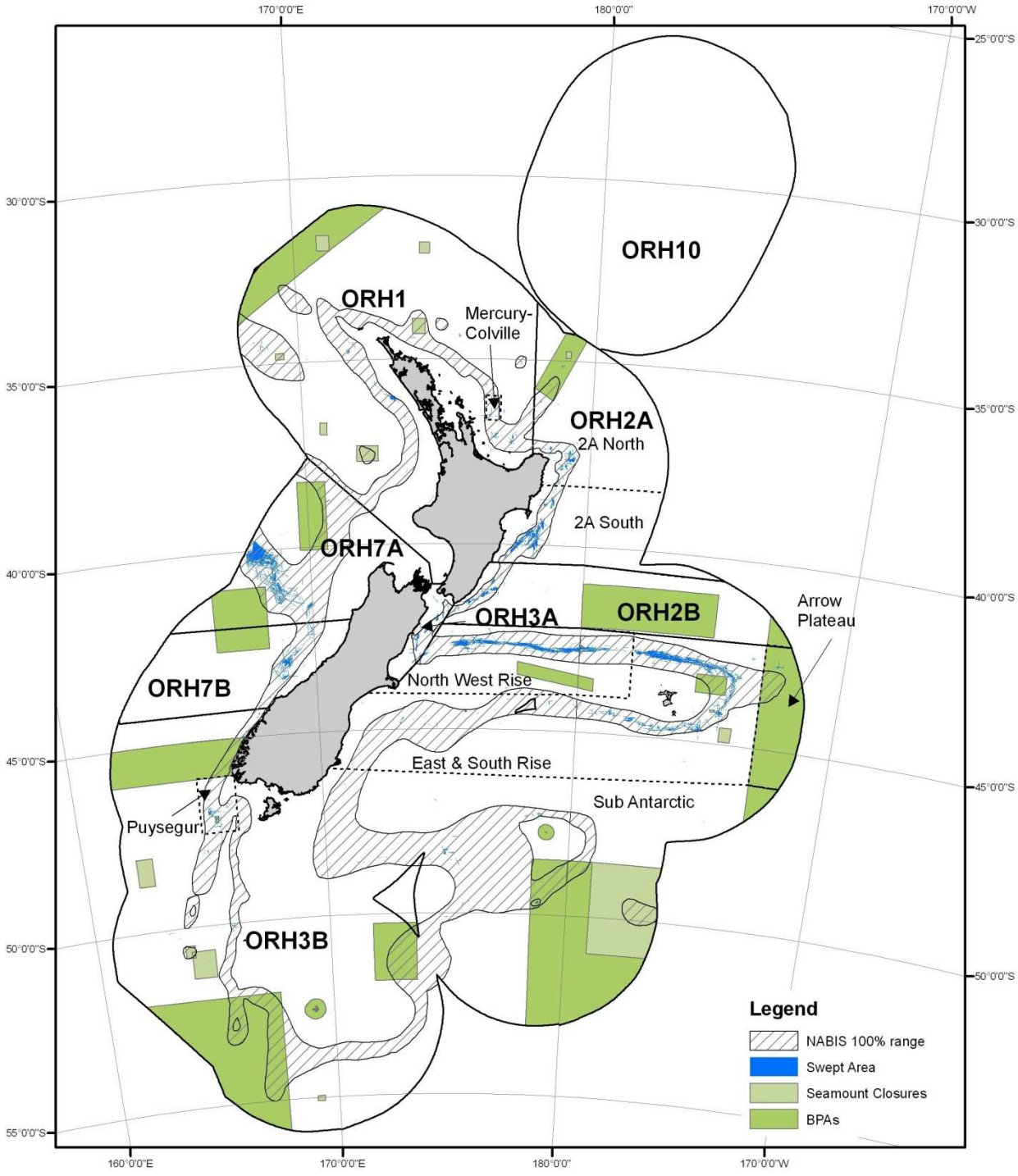
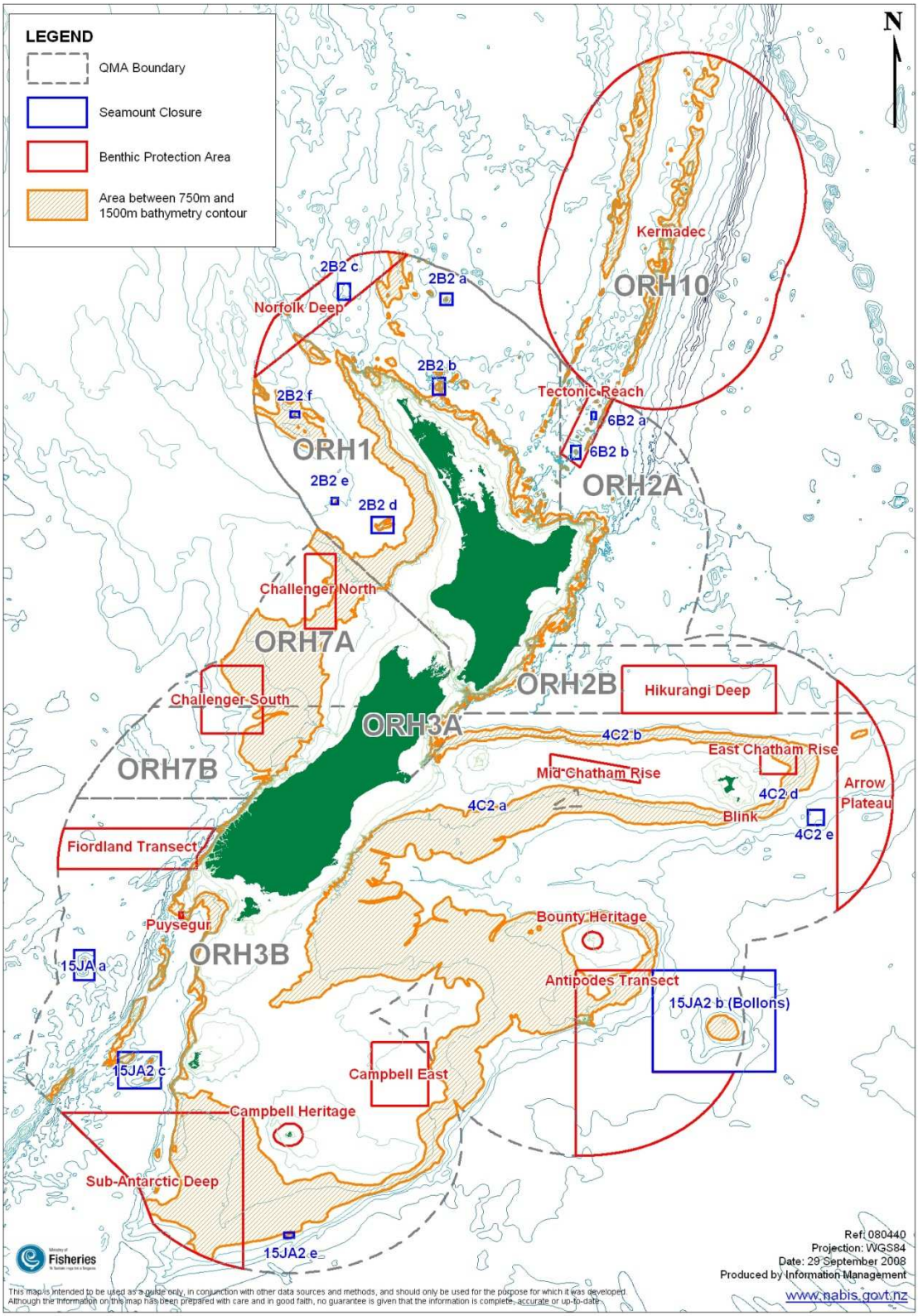


Figure 4. Orange roughy depth range and areas closed to bottom trawling within the New Zealand EEZ



Operational Objectives for orange roughy fisheries

This section describes the operational objectives that have been identified for the orange roughy fisheries. The table below details each operational objective and indicates which management objective(s) 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 and they will drive all management action in the fishery. These operational objectives will be critical in determining the annual management of all orange roughy fisheries for the five years that this iteration of the National Deepwater Plan is in place. The individual tasks that contribute to the delivery of each operational objective will be specified each year in the annual operational plan.

Table 4. Operational objectives (OO) contributing to achieving each of the 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

Operational objective	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 Ensure the management of each orange roughy fishery is explicitly linked to agreed management objectives from 2011	●	●●												
OO1.2 Ensure the research and monitoring programme for all orange roughy fisheries is clearly linked to management objectives by 2010	●	●		●●										
OO1.3 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, from 2011		●●	●			●								

Operational objective	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
OO1.4 Ensure that all research used to inform management continues to be peer reviewed and meets approved research standards					●●	●								
OO1.5 Ensure that all management settings are peer reviewed and comply with, or exceed, international best practice, progressively from 2011			●		●●	●								
OO1.6 Monitor levels of fisher compliance annually against a set of agreed compliance standards and benchmarks, from 2011	●		●		●●									
OO1.7 Ensure appropriate and transparent action is taken when compliance levels fall below the agreed benchmark from 2011	●		●		●●									
OO1.8 Create an 'information hub' where all information on the management of orange roughy and black cardinalfish is available and easily accessible by all from 2012	●					●●								
OO1.9 Facilitate greater commercial iwi involvement in the management of orange roughy and black cardinalfish through the Deepwater Group Ltd from 2010			●				●●							
OO1.10 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 orange roughy and black cardinalfish from 2010			●				●●							
OO1.11 Ensure management measures and controls are assessed in terms of their contribution to the value of the orange roughy fisheries before implementation from 2011	●●						●							

Operational objective	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 Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010		●				●		●●	●				●	
OO2.2 Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012		●				●		●●	●				●	
OO2.3 Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised		●				●		●	●●				●	
OO2.4 Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011	●			●						●●	●●	●●	●●	●●
OO2.5 Assess if existing protection of habitats of particular significance to the management of orange roughy fisheries is appropriate by 2013			●						●●				●	
OO2.6 Monitor trends in captures of incidental bycatch species (Tier 3 species) in the orange roughy fishery from 2010			●	●●							●●			
OO2.7 Minimise the use of generic reporting codes to record bycatch information in the orange roughy and black cardinalfish fisheries progressively from 2011				●●							●●			
OO2.8 Ensure that interactions with ETP species identified as at risk during the ERA process are managed to avoid or minimise adverse effects to acceptable levels (which may include standards) from 2012			●		●●							●●	●	
OO2.9 Appropriate spatial management measures to address the impact that orange roughy bottom trawl fishing activity has on the benthic habitat are implemented post 2013														●●

Measuring performance

Monitoring and measuring performance is critical to ensure operational objectives are achieving the management objectives, the fisheries goals 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 in the fishery. These review criteria provide a gap analysis for the management of orange roughy fisheries as they specify the current status of the orange roughy management regime 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 measurement of where we are now compared with where we will be in 5 years time, i.e. how the management of orange roughy has improved over the five year term of the National Deepwater Plan. Review criteria allow us to demonstrate that, through the implementation of operational objectives specified in this chapter clear and definite progress has been made towards meeting a management objective.

The nature of some of the management objectives means it may not be feasible to fully meet all of the management objectives within the five-year life span of this iteration of the National Deepwater Plan.

Each of the management objectives is assessed below in terms of its current status with regard to the orange roughy fisheries collectively, and the target status after the National Deepwater Plan has been in place for five years.

Management Objectives - Utilisation

MO 1.1	**Enable economically viable orange roughy fisheries in New Zealand over the long term**
Status at start of plan	○ Current orange roughy quota value is $282m (2009) ○ Current orange roughy export earnings are $51M annually (2009)
Target status at 5 year review	○ The real value of orange roughy quota is increased ○ Management decisions are formally assessed in terms of their value contribution prior to being implemented ○ Information necessary to manage fisheries is obtained on a cost-effective basis
Supporting operational objectives	
OO1.1	Ensure the management of each orange roughy fishery is explicitly linked to agreed management objectives from 2010
OO1.2	Ensure the research and monitoring programme for all orange roughy fisheries is clearly linked to management objectives by 2010
OO1.6	Monitor levels of fisher compliance annually against a set of agreed

	compliance standards and benchmarks, from 2011
OO1.7	Ensure appropriate and transparent action is taken when compliance levels fall below the agreed benchmark, from 2011
OO1.8	Create an 'information hub' where all information on the management of orange roughy and black cardinalfish is available and easily accessible by all from 2012
OO2.4	Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2012

MO 1.2	**Ensure there is consistency and certainty of management measures and processes in the orange roughy fisheries**
Status at start of plan	○ All orange roughy fisheries are managed by the Ministry of Fisheries in collaboration with DWG ○ There is currently no fisheries plan in place that sets out the management objectives to guide the management of these fisheries ○ Key management decisions are consulted on widely across all stakeholder groups with an interest in orange roughy ○ Few management decisions are assessed in terms of the value that they contribute to both New Zealand and quota owners ○ Catch is monitored annually against TACCs, voluntary catch limits and voluntary catch spreading arrangements ○ There is limited information available in terms of levels of compliance in the orange roughy fisheries ○ Management measures and processes to address environmental issues have been advanced in recent years but further work may be required in some areas (trophic linkages and ecosystem functioning) ○ There is currently no single information source that can be accessed by people with an interest in the management of the orange roughy fisheries
Target status at 5 year review	○ Wide support and compliance with both regulatory and non-regulatory management measures in place in these fisheries – and this is apparent in the performance of the orange roughy fisheries against compliance benchmarks. ○ Collaborative management relationship continues with greater benefits realised and is extended to other stakeholder groups ○ Regular internal and external consultation and review processes continued ○ 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	
OO1.1	Ensure the management of each orange roughy fishery is explicitly linked to agreed management objectives from 2011
OO1.2	Ensure the research and monitoring programme for all orange roughy fisheries is clearly linked to management objectives by 2010
OO1.3	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, from 2011
OO1.11	Ensure management measures and controls are assessed in terms of their contribution to the value of the orange roughy fisheries before implementation from 2011
OO2.1	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010
OO2.2	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012
OO2.3	Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised

MO 1.3	**Ensure the orange roughy fisheries 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 orange roughy ○ 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 orange roughy fisheries are managed ○ There is wider public acknowledgement that orange roughy fisheries are well managed ○ Orange roughy fisheries are managed so that they are capable of achieving third party certification, if required
Supporting operational objectives	
	Note that all operational objectives and management objectives contribute to the delivery of MO1.3

MO 1.4	Ensure the effective management of the orange roughy fisheries is achieved through the availability of appropriate information
Status at start of plan	○ Management of all orange roughy fisheries is supported by a significant research programme but the outputs from this programme are frequently contentious and, in the absence of agreed harvest strategies, may not be clearly linked to management requirements ○ 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 ○ Available information is often highly technical and difficult to understand ○ All scientific information used to inform management decisions is peer reviewed
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 ○ All research used to inform management decisions continues to meet MFish standards and peer review requirements
Supporting operational objectives	
OO1.2	Ensure the research and monitoring programme for all orange roughy fisheries is clearly linked to management objectives by 2010
OO2.4	Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.6	Monitor trends in captures of incidental bycatch species (Tier 3 species) in the orange roughy fishery from 2010
OO2.7	Minimise the use of generic reporting codes to record bycatch information in the orange roughy and black cardinalfish fisheries progressively from 2011

MO 1.5	Ensure New Zealand's orange roughy fisheries are recognised as being consistent with, or exceeding, national and international best practice
Status at start of plan	Orange roughy is listed at the bottom of several sustainable consumer choice assessments produced by environmental NGOs (although the conclusions reached by these assessments are not supported by the Ministry of Fisheries)
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 orange roughy fisheries are managed ○ Levels of compliance in the orange roughy fisheries are monitored annually against compliance benchmarks and performance of the fisheries exceeds these benchmarks ○ There is wider public acknowledgement that orange roughy fisheries are well managed and are consistent with or exceeding best practice ○ Orange roughy fisheries are managed so that they are capable of achieving third party certification, if required

Supporting operational objectives	
OO1.4	Ensure that all research used to inform management continues to be peer reviewed and meets approved research standards
OO1.5	Ensure that all management settings are peer reviewed and comply with, or exceed, international best practice, progressively from 2011
OO1.6	Monitor levels of fisher compliance annually against a set of agreed compliance standards and benchmarks, from 2011
OO1.7	Ensure appropriate and transparent action is taken when compliance levels fall below the agreed benchmark from 2011

MO 1.6	**Ensure New Zealand's orange roughy fisheries are transparently managed**
Status at start of plan	○ Information currently available on the management of orange roughy fisheries 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 orange roughy fisheries
Target status at 5 year review	○ The Ministry of Fisheries website is acknowledged as the most comprehensive source of information on the management and performance of the orange roughy fisheries ○ The Annual Operational Plan describes management procedures for orange roughy for the upcoming fishing year. ○ The Annual Review Report describing the performance of the orange roughy fisheries in the previous fishing year is produced and made publicly available ○ There is greater awareness and understanding of how orange roughy fisheries are managed
Supporting operational objectives	
OO1.3	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, from 2011
OO1.4	Ensure that all research used to inform management continues to be peer reviewed and meets approved research standards
OO1.5	Ensure that all management settings are peer reviewed and comply with, or exceed, international best practice, progressively from 2011
OO1.8	Create an 'information hub' where all information on the management of orange roughy and black cardinalfish is available and easily accessible by all from 2012
OO2.1	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010
OO2.2	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012
OO2.3	Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised

MO 1.7	Ensure the management of New Zealand's orange roughy fisheries meets the Crown's obligations to Maori under fisheries settlement acts
Status at start of plan	Iwi quota owners are not actively represented in the management of orange roughy fisheries
Target status at 5 year review	○ Iwi with an interest in orange roughy fisheries are actively engaged in the management of these fisheries ○ Iwi membership of the DWG has increased ○ Clear and agreed processes in place to allow TOKM to represent commercial iwi views, where necessary ○ Iwi with an interest in orange roughy fisheries are enjoying the benefits of responsible asset management ○ Mechanism for wider iwi engagement is acknowledged to be through iwi fisheries plans and iwi forums
Supporting operational objectives	
OO1.9	Facilitate greater commercial iwi involvement in the management of orange roughy and black cardinalfish through the DWG from 2010
OO1.10	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 orange roughy and black cardinalfish from 2010

Management Objectives - Environment

MO 2.1	Ensure orange roughy and black cardinalfish stocks are managed to an agreed harvest strategy
Status at start of plan	○ Harvest strategies, consistent with the Harvest Strategy Standard, are not yet fully in place for any of the orange roughy or black cardinalfish fisheries ○ An F_{MSY} based harvest strategy focussing on the method of establishing a catch limit when the stock is above the soft limit has been developed for the ESCR and ORH7A fisheries but further work is required to complete and implement the harvest strategy for this stock
Target status at 5 year review	○ Orange roughy and black cardinalfish stocks are managed either at or above agreed target levels or are managed to ensure that stocks are moving towards an agreed target ○ Harvest strategies, consistent with the Harvest Strategy Standard, are established and implemented for all major orange roughy and black cardinalfish stocks ○ The necessary data and information is available to regularly assess performance against agreed biological reference points in all major orange roughy and black cardinalfish stocks
Supporting operational objectives	
OO2.1	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010
OO2.2	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012
OO2.3	Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised

MO 2.2	Maintain the genetic diversity of orange roughy and black cardinalfish stocks
Status at start of plan	○ There is little information available on the genetic diversity within orange roughy or black cardinalfish stocks ○ Information on population structure (sex and size class distribution) for orange roughy and black cardinalfish is available from research surveys and observer data although coverage varies widely between stocks
Target status at 5 year review	○ Information is available (collected as part of the 10 Year Research Programme) on sex and size class structure for all orange roughy and black cardinalfish stocks and processes are in place to monitor trends in this information[9]

[9] Note that achieving the target status for MO 2.1 at 5 year review will make a significant contribution to ensuring the genetic diversity of these species is maintained.

Supporting operational objectives	
OO2.1	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010
OO2.2	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012
OO2.3	Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO1.5	Ensure that all management settings are peer reviewed and comply with, or exceed, international best practice, progressively from 2011

MO 2.3	**Protect habitats of particular significance to fisheries management**
Status at start of plan	○ Habitats of particular significance to the management of orange roughy fisheries have not been defined, although it is recognised that orange roughy are frequently associated with underwater topographic features such as hills and canyons ○ Regulatory closures under the Seamount and BPA initiatives have closed large areas of the New Zealand EEZ to bottom trawling[10]
Target status at 5 year review	○ A policy definition is available which describes what is meant by 'habitats of particular significance to fisheries management' ○ Habitats of particular significance to the management of orange roughy fisheries have been identified ○ Where necessary, management measures to further protect these habitats have been identified and are implemented post 2013
Supporting operational objectives	
OO2.4	Complete a ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.5	Assess if existing protection of habitats of particular significance to the management of orange roughy fisheries is appropriate by 2013
OO2.9	Appropriate spatial management measures to address the impact that orange roughy bottom trawl fishing activity has on the benthic habitat are implemented post 2013

[10] Sixteen percent of the area of the EEZ within the depth range of 750 to 1500 m is within the Benthic Protection Area closures and the Seamount closures as shown in Figure 5.

MO 2.4	Identify and avoid or minimise adverse effects of orange roughy fishing activity on incidental bycatch species
Status at start of plan	○ Orange roughy fisheries are relatively clean fisheries in terms of bycatch but are known to take a number of finfish and deepwater shark species ○ Approximately 25% of the catch of non-QMS species reported by observers in orange roughy fisheries (Table 1) is reported against generic codes, particularly for rattail and shark species ○ Reported catch of non-QMS species that are reported against individual species codes are monitored under the process detailed in the paper 'Identification of candidate stocks for QMS introduction – standards and organisational procedures'
Target status at 5 year review	○ Incidental bycatch from orange roughy fisheries is monitored annually ○ Results of the ERA process ensure that high risk bycatch socks are identified and harvest trends are assessed annually ○ Action is taken when bycatch levels for a particular species mean that the species sustainability may be compromised or utilisation opportunities may be forgone – action may include QMS entry or other section 11 management measures ○ The use of generic reporting codes used by observers and fishers is reduced to less than 15% of total reported incidental bycatch
Supporting operational objectives	
OO2.4	Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.6	Monitor trends in captures of incidental bycatch species (Tier 3 species) in the orange roughy fishery from 2010
OO2.7	Minimise the use of generic reporting codes to record bycatch information in the orange roughy and black cardinalfish fisheries progressively from 2011

MO 2.5	Manage orange roughy fisheries to avoid or minimise adverse effects on the long term viability of protected, endangered and threatened species
Status at start of plan	○ Orange roughy fisheries are known to have a low level of interaction with fur seals, seabirds and protected shark and coral species ○ Seabird interactions are managed through both regulation and non-mandatory measures ○ Interactions with protected shark species are low ○ Marine mammal interactions are infrequent but the small risk of interactions is mitigated through non-mandatory measures (MMOP) ○ There are no management measures in place specific to protected coral species but significant areas of New Zealand EEZ are closed to bottom trawling under the Seamount and BPA initiatives

Target status at 5 year review	○ Robust information is available on actual incidental interactions with ETP species from all vessels targeting orange roughy ○ The ecological risk assessment (ERA) has assessed the nature and extent of the impact of the orange roughy fisheries 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 orange roughy fisheries are managed to agreed standards
Supporting operational objectives	
OO2.4	Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.8	Ensure that interactions with ETP species identified as at risk during the ERA process are managed to avoid or minimise adverse effects to acceptable levels (which may include standards), from 2012

MO 2.6	**Manage orange roughy 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 orange roughy trawl activity is limited
Target status at 5 year review	○ The ERA has identified all adverse effects on biological diversity ○ Management measures are either in place, or under development, to avoid or minimise adverse effects on biological diversity of the aquatic environment
Supporting operational objectives	
OO2.1	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010
OO2.2	Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012
OO2.3	Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised
OO2.4	Complete an ecological risk assessment on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.5	Assess if existing protection of habitats of particular significance to the management of orange roughy fisheries is appropriate by 2013
OO2.8	Ensure that interactions with ETP species identified as at risk during the ERA process are managed to avoid or minimise adverse effects to acceptable levels (which may include standards), from 2012

MO 2.7	Manage effects from the impact of orange roughy 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 which have closed over 30% of the New Zealand EEZ to bottom trawling activity
Target status at 5 year review	○ Assessment (post 2013) completed of whether existing benthic protection measures are sufficient ○ Variations to existing spatial protection implemented as appropriate on the basis of this assessment
Supporting operational objectives	
OO2.4	Complete an ecological risk assessment (ERA) on the effects of the orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011
OO2.5	Assess if existing protection of habitats of particular significance to the management of orange roughy fisheries is appropriate by 2013
OO2.9	Appropriate spatial management measures to address the impact that orange roughy bottom trawl fishing activity has on the benthic habitat are implemented 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 and actions to support the Operational Objectives will be specified in the Annual Operational Plan. A summary of these actions can be found on the introduction section to this chapter on page 3.

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 and actions or 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 and actions 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. These performance indicators will be reported against in the Annual Review Report.

Operational objectives – Utilisation Performance Indicators

MO1.2	**OO1.1**	**Ensure the management of each orange roughy fishery is explicitly linked to agreed management objectives from 2011**
	1	Cost benefit evaluation process developed during 2010-11 for all management decisions relevant to orange roughy
	2	Evaluation process implemented from 2011-12
MO1.4	**OO 1.2**	**Ensure the research and monitoring programme for all orange roughy fisheries is clearly linked to management objectives by 2010**
	1	All orange roughy research is delivered through the 10 Year Research Programme (as described in Part 1A) from 2011
MO1.2	**OO 1.3**	**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, from 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 December 2010
	4	Environmental Advisory Group established by end of 2010.

MO1.5	**OO 1.4**	**Ensure that all research used to inform management continues to be peer reviewed and meets approved research standards**
	1	All science information used to inform management meets the appropriate research standards and is peer reviewed through MFish processes
MO1.5	**OO 1.5**	**Ensure that all management settings are peer reviewed and comply with, or exceed, international best practice, progressively from 2011**
	1	Measures to achieve this objective are clearly documented in the Annual Operational Plan and performance is assessed against the Annual Review Report from 2011
MO1.5	**OO 1.6**	**Monitor levels of fisher compliance annually against a set of agreed compliance standards and benchmarks, from 2011**
	1	Performance of the orange roughy and key bycatch fisheries are assessed against a comprehensive set of compliance benchmarks from 2011
MO1.5	**OO 1.7**	**Ensure appropriate and transparent action is taken when compliance levels fall below the agreed benchmark from 2011**
	1	MFish Field Operations report annually on actions taken against operators and quota owners engaged in non-compliant activity across all deepwater fisheries. This information and subsequent enforcement actions are summarised in the Annual Review Report from 2011
MO1.6	**OO1.8**	**Create an 'information hub' where all information on the management of orange roughy and black cardinalfish is available and easily accessible by all from 2012**
	1	MFish website is the 'go-to' site for public and media for full information on the management of orange roughy and black cardinalfish stocks from 2012
MO1.7	**OO1.9**	**Facilitate greater commercial iwi involvement in the management of orange roughy and black cardinalfish through the DWG from 2010**
	1	Improved iwi participation in management issues is apparent from increased iwi representation on the DWG
MO1.7	**OO1.10**	**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 orange roughy and black cardinalfish from 2011**
	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

MO1.7	OO1.11	Ensure management measures and controls are assessed in terms of their contribution to the value of the orange roughy fisheries before implementation from 2011
	1	Cost benefit evaluation process developed during 2010-11 for all management decisions relevant to orange roughy
	2	Evaluation process implemented from 2011-12

Operational objectives – Environmental Performance Indicators

MO2.1	**OO 2.1**	**Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all major orange roughy stocks from 2010**
	1	Biological reference points developed and agreed for use across all orange roughy stocks from 2011
	2	Harvest control rules and rebuild strategies developed and agreed for individual stocks from 2011
	3	Monitoring and management of orange roughy fisheries against the harvest strategy[11] agreed by: -2011 for ESCR, -2012 for NWCR, MEC, ORH 7A, ORH 2A North -2013 for Sub-Antarctic, ORH 1, ORH 7B, Puysegur
MO2.1	**OO 2.2**	**Implement an agreed harvest strategy, consistent with the Harvest Strategy Standard, progressively across all black cardinalfish stocks from 2012**
	1	Biological reference points for black cardinalfish stocks developed and agreed by 2011
	2	Harvest control rules and rebuild strategies developed and agreed during 2012
	3	Harvest strategy implemented progressively across all black cardinalfish stocks from 2012
MO2.2	**OO 2.3**	**Ensure that the total harvest of orange roughy and key bycatch species is balanced against ACE and that overcatch of the TACC is minimised**
	1	Performance of the orange roughy 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
MO2.3 MO2.4 MO2.5 MO2.6 MO2.7	**OO 2.4**	**Complete an ecological risk assessment (ERA) on the effects of orange roughy fisheries on the aquatic environment (including the effects on trophic linkages etc.) by 2011**
	1	ERA completed, with stakeholder participation, by 2012
	2	Final report available on additional management measures required to address environmental impacts from orange roughy fishing by 2012
	3	Description of proposed mitigation approach for implementation and timeframe for these additional measures is available for the start of the 2012- 2013 fishing year

[11] Monitoring strategies will vary between stocks but in all cases will dictate how the status of a stock will be assessed against the biological reference points. Note that for some stocks an agreed monitoring strategy will build on an existing time series of survey data, while in others a new time series will be initiated. In the latter case, information to determine stock status may not be available for several years.

MO2.2	**OO 2.5**	**Assess if existing protection of habitats of particular significance to the management of orange roughy fisheries is appropriate by 2013**
	1	Report produced documenting and mapping habitats of particular significance in the orange roughy fisheries by 2012
	2	Assessment report on extent of existing protection measures in meeting protection requirements for habitats of particular significance for fisheries management available by 2013
	3	Report specifying additional levels of habitat protection required for orange roughy fisheries management purposes available by 2014 for implementation during 2014-2015
MO1.4 MO2.4	**OO 2.6**	**Monitor trends in captures of incidental bycatch species (Tier 3 species) in the orange roughy fishery from 2010**
	1	Report produced annually on extent of captures of incidental bycatch species from observed vessels from 2010
	2	Level 1 Risk Assessment completed for all deepwater and middle-depth incidental bycatch species by end of 2011-2012
MO1.4 MO2.4	**OO 2.7**	**Minimise the use of generic reporting codes to record bycatch information in the orange roughy and black cardinalfish fisheries progressively from 2011**[12]
	1	Up to date species identification guides and reporting codes are available for use on all deepwater trawl vessels from 2011
	2	Annual audit completed on the extent of use of generic reporting codes for ETP and bycatch species starting in 2011
MO1.5 MO2.5	**OO 2.8**	**Ensure that interactions with ETP species identified as at risk during the ERA process are managed to avoid or minimise adverse effects to acceptable levels (which may include standards from 2012**
	1	Report on incidental ETP captures included in Annual Review Report from 2011
	2	Report on performance of orange roughy fishery against available environmental standards produced annually from 2011
	3	Additional management measures to ensure the fishery meets agreed standards are implemented within a time frame consistent with the agreed standard
	4	In the absence of standards a transparent and clearly demonstrated approach of continuous improvement is implemented from October 2011

[12] Generic codes will remain necessary as it will never be possible for all bycatch to be identified to species level. This objective establishes the aim of continual improvement in reporting of bycatch, by both observers and vessels, to species level over the duration of the plan.