Fisheries Improvement Plan
Orange Roughy Mid East Coast (ORH MEC)

Version 4: December 2017

Version 3: July 2016

Version 2: March 2015

Version 1: March 2014

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Overview

Deepwater Group (DWG) and the Ministry for Primary Industries (MPI) are committed to the ongoing sustainable management of New Zealand's deepwater fisheries. To this end we have jointly embarked on a Fisheries Certification Programme (FCP) with the objective of achieving independent certification of New Zealand's key deep water fisheries, including orange roughy fisheries. To date, three orange roughy fisheries have achieved MSC certification. Our FCP is a four-staged work programme and a summary of this process to date can be seen on our website (Certification of New Zealand's deepwater fisheries). As part of this programme, the Mid East Coast orange roughy fishery is in a formal Fishery Improvement Plan (FIP).

The FIP was first developed in March 2014 following a series of stakeholder meetings and consideration of a wide range of options, tools and 'templates'. DWG has developed the FIP using tools and templates provided by MSC to establish a public, transparent, inclusive and stepwise approach towards MSC Certification.

The objective of this FIP is to ensure the performance of the fishery meets the MSC Fisheries Standard and subsequently achieves MSC certification. It also serves as a mechanism which enables external observers to track progress and to assess fisheries performance against the MSC Fisheries Standard.

This FIP is specific to the Orange Roughy Mid East Coast fishery (ORH MEC). The following sections provide further details on the FIP including a Gap Analysis and Remedial Action Plan.

ORH MEC Current FCP Status

ORH MEC fishery is currently progressing through the Remedial Action Plan stage of the Fishery Certification Process (FCP) (Figure 1, Table 1) involving: re-estimation of spawning stock biomass; re-assessment of stock status; re-evaluation of effects on ETP species; and the implementation of remedial management actions within a specified timeframe.

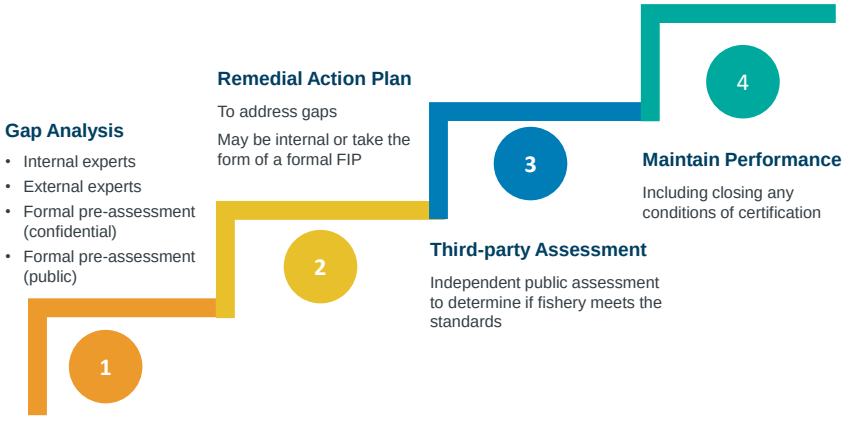

Figure 1. The illustrative stages, 1 to 4, Deepwater Group's Fisheries Certification Programme.

Table 1 Timelines and milestones for the Fisheries Certification Programme for Orange Roughy Mid East Coast (ORH MEC)

Fisheries Certification Programme Stage	Deliverables and outcomes	Action Lead	Timeline	Progress
Gap Analysis 1	**Phase 1 - MSC Pre-assessment:** Contract MRAG-Americas to undertake MSC pre-assessment. Hold consultation meeting with stakeholders.	MPI & DWG	Feb - Aug 2013	Completed ✓
	Phase 2 - Fishery Gap Analysis: Identification of non-conformities and information gaps.	MPI & DWG	Aug - Sep 2013	Completed ✓
	Phase 3 - Fishery Evaluation: Complete on the 'Fishsource' template. Provide current information to Sustainable Fisheries Partnership for evaluation, scoring and posting on their 'Fishsource' website. Publish documents on the DWG website.	MPI & DWG	Nov 2013	Completed ✓
Remedial Action Plan 2	**Phase 1:** **Fishery Improvement Analysis:** Identify the reasons why certain PIs are unlikely to meet the MSC Fisheries Standard and develop remedial management actions. **Assessment of the Environmental Effects of Fishing:** Develop methodology, assemble expert panel, invite participants, hold workshop, produce report and make it publicly available. **Develop ORH MEC Improvement Action Plan:** Develop action plan to address anticipated non-conformities and information gaps. Determine deliverables, timelines, milestones & system for monitoring progress against this plan.	MPI & DWG	Mar 2013 - Feb 2014	Completed ✓
	Phase 2: **Fishery Improvement Plan:** Implement remedial management actions within an agreed and time-bound plan using the MSC Monitoring and Benchmarking FIP Template. Post online for public viewing. **Implementation of Work Programmes:** Implement work programmes to address the requirements of the Action Plan.	MPI & DWG	Jan 2014 -	Remedial Actions In process ⚙
Third Party Assessment 3	**Phase 1 - MSC Assessment**: Undertake formal assessment of the ORH MEC fishery against the MSC Fisheries Standard.	MPI & DWG	TBD	Dependent on stock rebuild
	Phase 2 - MSC Certification: Achieve certification of the fishery against the MSC Fisheries Standard.	MPI & DWG	TBD	Dependent on stock rebuild

Stage 1 - Gap Analysis

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The three phases of the Gap Analysis have been completed:

- Phase 1 Confidential Pre-assessment against the MSC Standard
- Phase 2 Fishery Gap Analysis
- Phase 3 Fishery Evaluation

The outcomes of the pre-assessment are covered below.

MSC Pre-Assessment

MRAG-Americas undertook a detailed pre-assessment of the ORH MEC fishery against the MSC Fisheries Standard (v1.3) on 22 and 23 August 2013, in an open workshop forum where all interested parties and MSC stakeholders were invited to participate.

The pre-assessment workshop was attended by representatives from Deepwater Group, Ministry for Primary Industries, Department of Conservation, World Wildlife Fund, National Institute of Water and Atmospheric Research, Innovative Solutions Ltd, Clement & Associates Ltd and Seafood New Zealand.

The outcomes from the Pre-Assessment Report, revised in light of subsequent management interventions, as applied to three MSC certified orange roughy fisheries, are summarised in Table 2. Pre-assessment results, and updated scores, for each Performance Indicator are categorised as: 'red' (i.e. likely to score below 60); 'orange' (i.e. likely to score between 60 & 80); or 'green' (i.e. likely to score above 80). Table 2 provides a snapshot of the fishery as it was assessed in 2013 and as re-assessed in 2017.

Key Documents:

- Pre-assessment Report (MRAG, 2013)
- Minutes of consultation meeting with MSC Stakeholders (DWG, 2013).

Table 2 ORH MEC 2013 pre-assessment and 2017 revised scores.

MSC Component	MSC Performance Indicator	MSC Performance Indicator	Outcome 2013	Outcome 2017
Outcome	1.1.1	**Stock Status:** Stock at a level which maintains high productivity	60-79	60-79
	1.1.2	**Stock Rebuilding:** Where stock depleted - there is evidence of rebuilding	<60	60-79
Management	1.2.1	**Harvest Strategy:** Precautionary and robust harvest strategy in place	60-79	60-79
	1.2.2	**Harvest Control Rules & Tools:** Well defined harvest control rules in place	60-79	60-79
	1.2.3	**Information & Monitoring:** Relevant Information collected to support harvest strategy	>80	>80
	1.2.4	**Assessment of Stock Status:** Assessment of stock status is adequate	>80	>80
	P1 ALL	Sustainability of Exploited Stock	Fail	Pass
Primary Species	2.1.1	**Primary Species Outcome:** Does not cause serious or irreversible harm to primary species	>80	>80
	2.1.2	**Primary Species Management:** Strategy in place for managing primary species	>80	>80
	2.1.3	**Primary Species Information:** Relevant information to help manage primary species	>80	>80
Secondary species	2.2.1	**Secondary Species Outcome:** Does not cause serious or irreversible harm to secondary spp.	60-79	>80
	2.2.2	**Secondary Species Management:** Strategy in place for managing secondary species	60-79	>80
	2.2.3	**Secondary Species Information:** Relevant information to help manage secondary species	>80	>80
ETP species	2.3.1	**ETP Species Outcome:** Meets national and international requirements for ETPs protection	60-79	60-79
	2.3.2	**ETP Species Management:** Precautionary management strategies in place	60-79	>80
	2.3.3	**ETP Species Information:** Relevant information to support management of impacts on ETPs	60-79	60-79
Habitats	2.4.1	**Habitats Outcome:** Does not cause serious or irreversible harm to habitat structure	60-79	>80
	2.4.2	**Habitats Management:** The strategy is adequate to determine risk to habitat types	>80	>80
	2.4.3	**Habitats Information:** Information adequate to determine risk to habitats	>80	>80
Ecosystem	2.5.1	**Ecosystem Outcome:** Does not cause serious or irreversible harm to ecosystem	>80	>80
	2.5.2	**Ecosystem Management:** Measures are in place to mitigate risk to ecosystem	>80	>80
	2.5.3	**Ecosystem Information:** Adequate knowledge of impacts of fishery on the ecosystem	>80	>80
	P2 ALL	Maintenance of Ecosystem	Pass	Pass
Governance and Policy	3.1.1	**Legal/Customary Framework:** Management system exists with legal/customary framework	>80	>80
	3.1.2	**Consultation, Roles & Responsibilities:** Management system has clear processes	>80	>80
	3.1.3	**Long Term Objectives:** Management policy contains clear long-term objectives	>80	>80
Fishery specific management system	3.2.1	**Fishery Specific Objectives:** Fishery has clear and specific outcome objectives	>80	>80
	3.2.2	**Decision Making Processes:** Management system includes effective decision making	>80	>80
	3.2.3	**Compliance & Enforcement:** Monitoring, control and surveillance mechanisms in place	>80	>80
	3.2.4	**Management Performance Evaluation:** Performance Evaluation processes in place	>80	75
	P3 ALL	Effective Management System	Pass	Pass
		Total number of PIs ≥80	18	21
		Total number of PIs 60-79	9	7
		Total number of PIs less than 60	1	0
		Overall BMT Index	0.80	0.88

Stage 2 - Remedial Action Plan

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Phase 1 Fishery Improvement Analysis - completed

The performance of ORH MEC was considered against a Pre-Assessment Report by MRAG-Americas to identify non-conformities and information gaps against the MSC Performance Indicators (SG60 and SG80).

A Fishery Improvement Analysis, developed in 2014, was used to inform remedial action work programmes as a step towards the Fishery Improvement Plan. A summary of the updated analysis as of August 2017 is provided in Appendix 1.

Phase 2 Fisheries Improvement Plan (FIP) – in progress

Implementation of remedial management actions and monitoring progress against a public, time-bound FIP.

Several management actions have been undertaken to remedy the gaps identified in Phase 1. The remaining actions required are provided in Table 3.

Projected timelines for completion of the remedial management actions are provided in Table 4.

2017 Progress Update

An update on progress made as of December 2017 towards completing the remedial management actions is provided in Table 5.

Table 3. Remaining remedial management actions and links to MSC Performance Indicators.

ACTIONS		ACTION LEAD & PARTNERS	Links to MSC Performance Indicators						
			P1 Target stocks					P2 Ecosystem	
			1.1.1	1.1.2	1.1.3	1.2.1	1.2.2	2.3.1	2.3.3
1. Stock assessment									
1.2	Update the stock assessment according to agreed methodology.	DWG & MPI							
1.3	Acceptance of stock assessment outputs by MPI.	DWG & MPI							
1.4	Conduct MSE to review HS and HCR.	DWG & MPI							
1.6	Review the need for, and implement if necessary, a rebuilding plan.	DWG & MPI							
2. Habitats and ecosystems									
2.3	Quantitatively determine ETP coral distributions within the fishery, the bioregion, and the EEZ.	DWG & MPI							
2.4	Assess the nature and extent of impact by the fishery on ETP corals.	DWG & MPI							

Table 4. Timelines for remedial management actions, revised December 2017.

ORH MEC	Progress (see key below)													
	2014		2015		2016		2017		2018		2019		2020	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
MSC Principle 1: Stock Status														
1.1 Undertake a further biomass survey.														
1.2 Update the stock assessment according to agreed methodology.														
1.3 Acceptance of stock assessment outputs by MPI.														
1.4 Conduct MSE and review HS and HCR.														
1.5 Undertake a high level review of stock assessment process.														
1.6 Review the need for, and implement if necessary, a rebuilding plan.														
MSC Principle 2: Ecosystem Management														
2.1 Identify main/secondary bycatch species.														
2.2 Document management strategy for bycatch species.														
2.3 Quantitatively determine ETP coral distributions within the fishery, the bioregion, and the EEZ.														
2.4 Assess the nature and extent of impact by the fishery on ETP corals.														
2.5 Document the management strategy for impacts on ETP corals.														
2.6 Assess nature and extent of impact by fishery on habitat structure and function.														
2.7 Document the management strategy for impacts on habitats.														

In-progress | Completed | Planned completion date

Table 5. Update on remedial management actions, December 2017.

MSC Principle 1: Stock Status		Progress Update 2017
1.1	Undertake a further biomass survey.	**Completed:** A biomass survey was undertaken in June 2017 and the results were reported in December 2017. The 2017 survey biomass estimate of 7,400 t was considerably higher than the biomass estimate of 4,200 t from a survey conducted in June 2013. Biomass surveys are scheduled to occur every 4 years.
1.2	Update the stock assessment according to agreed methodology.	A 2014 stock assessment estimated the stock to be below the soft limit (20% B_0) which triggered implementation of a time-bound rebuilding plan in line with the New Zealand Harvest Strategy Standard (HSS), with rebuild in not less than twice the time it would take in the absence of fishing. For MEC, this is estimated to be 42 years. New Zealand Fisheries Assessment Report No. 2014-50 (September 2014) provides a full write-up of the stock assessment (http://www.mpi.govt.nz/document-vault/4399). Note: A main uncertainty in the 2014 assessment was the proportion of the ORH MEC stock surveyed by the 2013 biomass survey. In 2017 a greater area was surveyed and acoustic snapshots were undertaken on two spawning aggregations. A revised stock assessment was undertaken in December 2017. The provisional outcome was that the stock remains below the soft limit of 20% B_0 but that it will continue to rebuild and, at the current harvest level, is projected to be above 30% B_0 (i.e. the lower end of the management target of 30 – 50% B_0), in 31 years' time (i.e. by 2049).
1.3	Acceptance of stock assessment outputs by MPI.	
1.4	Conduct MSE and review HS and HCR.	A Management Strategy Evaluation (MSE) has been developed for ORH fisheries (http://deepwatergroup.org//wp-content/uploads/2014/08/Cordue-2014-A-Management-Strategy-Evaluation-for-Orange-Roughy.-ISL-Re....pdf). The 2014 and 2017 MEC stock assessments estimated $B_{Current}$ to <20% B_0 rendering the HCR inappropriate. A rebuilding plan has been implemented (see Action1.6). The MSE will be rerun for ORH MEC in 2018, following acceptance of the updated stock assessment, as a basis for a review of the harvest strategy and harvest control rule. The rebuilding plan will continue until the stock reaches the target biomass level in the range of 30 - 50% B_0.
1.5	Undertake a high-level review of stock assessment process.	**Completed:** The ORH stock assessments were reviewed in 2013-14 during the annual DWFAWG Plenary Meeting by domestic and international experts including: Paul Starr (Starrfish, Canada); Prof. Matthew Dunn (Victoria University, New Zealand); Dr. Pamela Mace (Ministry for Primary Industries, New Zealand); Prof. Ray Hilborn (University of Washington, USA) and Drs. Malcolm Haddon and Judy Upston (CSIRO, Australia). The high-level review will be repeated in 2019-20.
1.6	Review the need for, and implement if necessary, a rebuilding plan.	**Completed:** A rebuilding plan has been developed and implemented for MEC that meets the New Zealand Harvest Strategy Standard. The 2014 stock assessment for the ORH MEC stock, which estimated the stock to be < 20% B_0, triggered implementation of a time-bound rebuilding plan in line with the New Zealand Harvest Strategy Standard (HSS). The MEC catch limit was consequently reduced from 1,230 to 525 tonnes to provide for stock rebuild. The rebuilding plan will be reviewed once results from the 2018 stock assessment are available. For the Minister's Decision on a TACC reduction for the MEC fishery see: http://www.fish.govt.nz/NR/rdonlyres/CAE54563-C844-4AF7-B5EE-168C6F880225/0/B14059ministersignedletter2.pdf.
MSC Principle 2: Ecosystem Management		**Progress Update 2017**
2.1	Identify 'main' Primary and/or Secondary species.	**Completed:** An assessment of the ecological effects of orange roughy fishing (AEEF) found the level of risk to bycatch species in four ORH fisheries was low to moderate for deep water sharks (Boyd, 2013). An updated review of observer-based estimates of total bycatch in all orange roughy fisheries revealed that orange roughy accounted for 93.8% of the catch in 2013-14, the most recent year for which data are available, and that no single bycatch species contributed more than 1.8% of the total catch (Anderson, 2017 http://fs.fish.govt.nz/Page.aspx?pk=113&dk=24284). For deep water sharks, which are considered 'low resilience' species, the bycatch of 7 species and a generic 'shark' component combined, amounted to 1.3% of the total catch. There are therefore no 'main' Primary or Secondary species.
2.2	Document management strategy for Primary and Secondary species.	**Completed:**
2.3	Quantitatively determine ETP coral distributions within the fishery, the bioregion, and the EEZ.	A coral distribution model for the EEZ was developed in 2015 (see: http://deepwatergroup.org/wp-content/uploads/2014/08/NIWA-2015-Assessment-of-orange-roughy-and-oreo-trawl-footprint-in-relation-to-protected-coral-species-distribution.pdf). This will be updated for the MEC fishery during 2018.
2.4	Assess the nature and extent of impact by the fishery on ETP corals.	Assessments of trawl footprint by all deep water trawl fisheries are updated annually. Assessment of fishery-specific impacts on ETP corals is ongoing and estimated to be completed during 2018. A pilot, level 2 (semi-quantitative) risk assessment of the impact of orange roughy fishing on ETP coral habitats was undertaken in 2014 (Clark et al., 2014). The Department of Conservation Threat Classification System ranks 2 coral species as 'Nationally Vulnerable' and 5 coral species as 'Declining' (Freeman et al., 2013).
2.5	Document the management strategy for impacts on ETP corals.	**Completed:**

2.6	Assess nature and extent of impact by fishery on habitat structure and function.	**Completed:** A pilot, level 2 (semi-quantitative) risk assessment of the impact of orange roughy fishing on ETP coral habitats was undertaken in 2014 (Clark et al., 2014).
2.7	Document the management strategy for impacts on habitats.	**Completed:**

Stage 3- Third-party Assessment

3

MSC Assessment

DWG's objective is to manage the MEC fishery towards achieving SG80 against all Performance Indicators.

Stage 3 of the ORH MEC Fishery Certification Programme requires a full assessment of this fishery against the MSC Fisheries Standard by an accredited MSC Conformity Assessment Body. The fishery will be considered for MSC assessment once the stock has rebuilt above the soft limit reference point of >20% B_0. An estimated timeframe for the rebuild will be determined through a management strategy evaluation for the fishery to be undertaken in 2018 following acceptance of the updated stock assessment.

MSC Certification

DWG will consider submitting the MEC fishery for MSC assessment when there is evidence of sustained stock rebuild towards the target biomass level.

Appendix 1

Orange Roughy Mid East Cost Fishery Improvement Analysis (Actions are referenced to Tables 3 and 4).

PI 1.1.1 – The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
MSC SG80 Certification Requirements	a) It is highly likely that the stock is above the point where recruitment would be impaired. b) The stock is at or fluctuating around its target reference point.	
MRAG-Americas Findings	MRAG-Americas assessors noted: • The lack of quantitative assessments based on fitting population dynamics models.	
Responses	• Demonstrate through an accepted stock assessment that the stock status is highly likely to be above the point at which recruitment would be impaired and at or above B_{MSY}.	**Actions 1.2 & 1.3**
PI 1.1.2 – Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
MSC SG80 Certification Requirements	a) A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years. b) There is evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within the specified timeframe.	
MRAG-Americas Findings	MRAG-Americas assessors noted: • The lack of projections given the current stock status relative to B_0. • The lack of evaluation of harvest strategy against rebuild to management target with required 20 years. • The lack of alternative assumptions for how assessment is conducted and provisions for future recruitment.	
Responses	• Develop a rebuilding plan for orange roughy fisheries to be implemented where the stock status is below the management target range that rebuilds the stock to the management target range in the required timeframe. • Test the robustness of the rebuilding plan using simulations based on the stock assessment model.	**Action 1.6**

PI 2.3.1 – The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.		
MSC SG80 Certification Requirements	a) The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. b) Direct effects are highly unlikely to create unacceptable impacts to ETP species. c) Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	
MRAG-Americas Findings	MRAG-Americas assessors noted: • The lack of robust distributional information of several cold water coral species (that overlap with the ORH Fishery) outside fished areas. • The lack of information defining the level of impacts with fisheries of protected corals, species identification, quantities taken and distribution. • The lack of any rationale to quantitatively determine if any impacts are such that they pose a risk of serious or irreversible harm to ETP coral species.	
Responses	• Document national (and relevant international) requirements for the protection of corals, demonstrating that direct effects (considering also indirect effects) are highly unlikely to create unacceptable impacts (impacts that hinder recovery or rebuilding) to ETP coral species. • Undertake desktop analysis of the nature and extent of information used in modelling coral density distributions, including (where possible) the distribution of corals within fished areas, outside fished areas, and within protected areas (BPAs and Seamount Closures). • Undertake desktop analysis of the distribution of coral genera/species in the New Zealand EEZ and within the ORH MEC fishery, coral taken within the ORH MEC fishery and determine (where possible) which genera/species are affected most by the ORH MEC fishery. • Undertake semi-quantitative analysis to demonstrate the nature and extent of the interactions with corals in areas that are fished (taking into account recovery and closed areas). Determine if effects of the fishery are: highly likely to be within limits of national (and international) requirements for protection of ETP coral species; highly unlikely to create unacceptable impacts to ETP coral species; and, consider indirect effects.	**Actions 2.3 & 2.4**

PI 2.3.3 – Relevant information is collected to support the management of fishery impacts on ETP species, including: (1) information for the development of the management strategy; (2) information to assess the effectiveness of the management strategy; and (3) information to determine the outcome status of ETP species.		
MSC SG80 Certification Requirements	a) Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. b) Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species. c) Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	
MRAG-Americas Findings	MRAG-Americas assessors noted: • There is insufficient quantitative information in some areas. • The lack of assessment of the level of threat by the orange roughy fishing on corals generally and on reef-forming stony corals in particular.	
Responses	• Document the management strategy to demonstrate the sufficiency of information "*to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP [coral] species*" so as to "*determine whether the fishery may be a threat to protection and recovery of [protected coral] species."* • Quantitatively determine the distributions of protected species within the New Zealand EEZ (to Generic level). • Quantitatively assess the nature and extent of impact by fishery of these protected coral species.	**Actions 2.3 & 2.4**