deepwater group

The Sustainable Management of

New Zealand's Oreo Fisheries

Introduction

The New Zealand seafood industry is committed to ensuring sustainable utilisation - sound environmental practices make good business sense. In deepwater fisheries, quota owners have combined their resources through the Deepwater Group Ltd (DWG) to ensure these fisheries are recognised as the best managed deepwater fisheries in the world. This summary illustrates how we put this philosophy into practice to ensure New Zealand's oreo fisheries are managed sustainably. It focuses on the main oreo fisheries, which are located on the Chatham Rise and contribute over 70% of New Zealand's total oreo catch.

Fishery Characterisation

Four oreo species are managed within the Quota Management System (QMS): black, smooth, spiky and warty. Commercial catches are comprised mainly of smooth and black oreo (Figures 1-4). Oreo are harvested by bottom trawl with 94% of tows located between 700 and 1,200 m. The Chatham Rise (OEO3A and OEO4) is the main fishing ground. In the past oreo catch has been taken as bycatch of the more valuable orange roughy fisheries but target fisheries are now more common in most areas for smooth or black oreo.

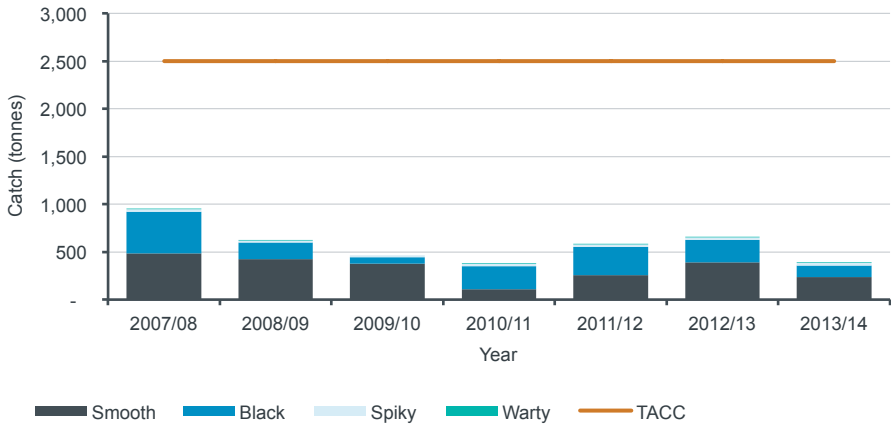

Figure 1 TACCs and Catches for OEO1[1]

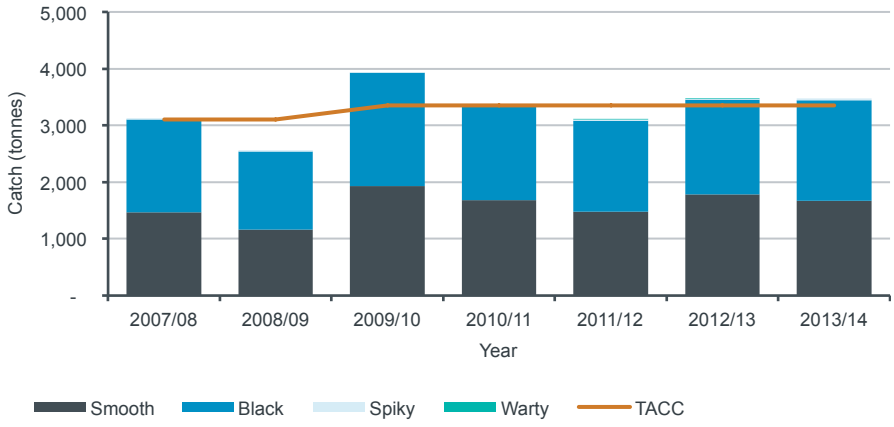

Figure 2 TACCs and Catches for OEO3A

[1] The Total Allowable Commercial Catch (TACC) is the amount of fish commercial fishermen are allowed to catch of a particular stock in a given year which has been set by the Minister.

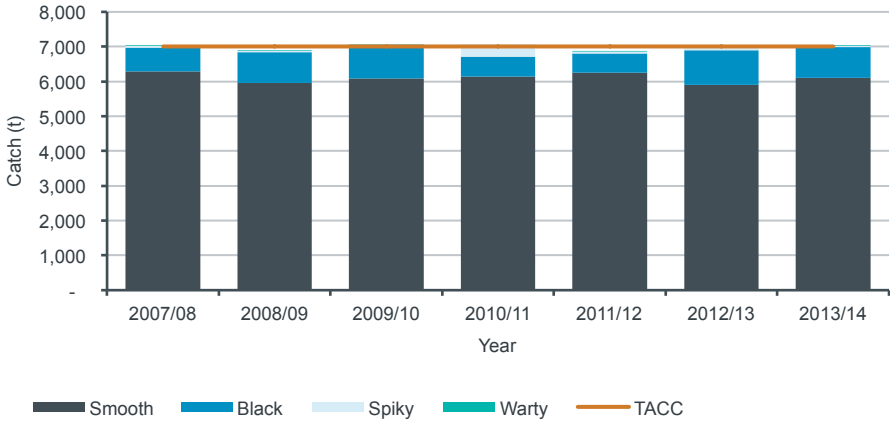

Figure 3 TACCs and Catches for OEO4

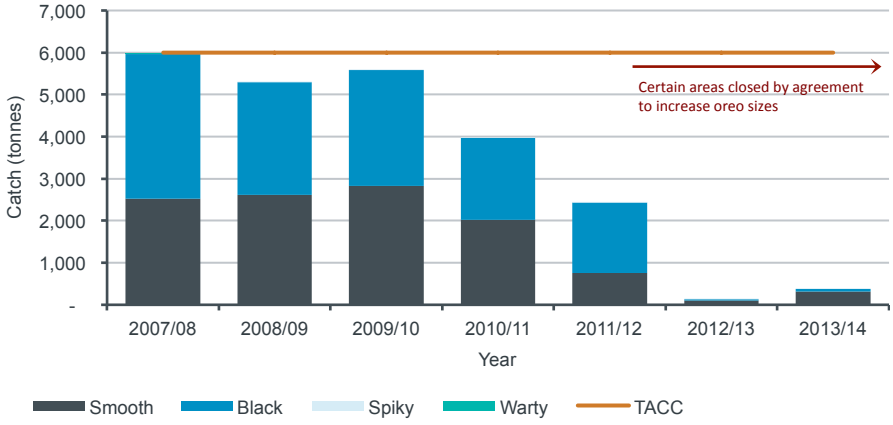

Figure 4 TACCs and Catches for OEO6

Stock Sustainability

Smooth and black oreo are managed and assessed as separate stocks according to location. Science supports the sustainable management of oreo catches in each of New Zealand's major deepwater oreo fishing grounds.

Table 1 Stock Status[2]

Stock	Year of Assessment	Current Biomass ($\%B_0$)	Notes
OEO3A Black	2013 (not accepted)	Unknown	Development of a new assessment model is expected to begin within the next eight months.
OEO3A Smooth	2009	36%	The stock size has been increasing since the late 1990s. Regular acoustic biomass surveys of this stock are undertaken; the most recent was in October 2014. A new stock assessment is scheduled during 2015-16.
OEO4 Black	2009 (CPUE)	Unknown	Catches from this stock are taken mainly as bycatch to target fishing for smooth oreo and orange roughy and are relatively small (500-1,000 t/yr). After an initial decline in CPUE during the 1980s and 1990s, CPUE was stable between 2003 and 2008. No assessments are currently planned for this stock.
OEO4 Smooth	2012	41% - 33%	The stock size has undergone a steady decline in biomass consistent with the fishing down phase. With the current annual catch, the stock size is likely to continue to decline. Provisional results from the 2014 assessment, to be completed by May 2015, support this observation. A reduction in the TACC to enable the stock size to rebuild back towards 40% B_0 is planned for 2015-16.

[2] Ministry for Primary Industries. (2014). Fisheries Assessment Plenary, May 2014: Stock Assessments and Yield Estimates. Wellington, New Zealand.

There are a number of management measures used to ensure stock sizes remain healthy:

Harvest Strategy

All fish populations, even those that aren't fished, naturally fluctuate in size. When these populations or 'stocks' decline in size, the management response is to reduce catch levels. Conversely, when stock sizes increase, catch levels are increased.

In New Zealand, this management framework is underpinned by the Fisheries Act 1996 which requires catch to be set at a level that:

"maintains the stock at or above the level that can produce the Maximum Sustainable Yield".

In 2008, the government implemented the Harvest Strategy Standard for New Zealand Fisheries (HSS)[3], which establishes best practice in relation to the setting of management targets and limits for QMS stocks. For oreo, the current management reference points are shown in Table 2 below.

Management Reference Points

Management reference points have been established consistent with the HSS.

Table 2 Oreo Fisheries Reference Points & Responses

Reference Point	Management Response
Management Target of 40% B_0	The stock size is permitted to fluctuate around this target. TACC levels are set to maintain stock size at or above this reference point.
Soft Limit of 20% B_0	If the stock size falls below this threshold, a formal time-constrained rebuilding plan is implemented to increase the stock size to above the target by requiring it to be at the target with a 70% probability.
Hard Limit of 10% B_0	If the stock size falls below this limit, the fishery will be considered for closure.
Rebuild Strategy	When rebuilding, a catch limit is set to enable the stock to rebuild in size to the management target in not more than twice the time it would take in the absence of fishing.

Stock Assessments

Mathematical assessment models are used to estimate current stock sizes. They are also used to estimate future stock sizes under different annual catch levels. Assessment results are peer-reviewed within the Ministry for Primary Industries' (MPI's) open scientific forums and must meet MPI's scientific standards before being accepted to inform management advice to the Minister. Once the assessments have been accepted they are publically reported and used to inform management decisions (e.g. TACC changes). Table 1 provides an extract of these results.

[3] Ministry of Fisheries. (2008). Harvest Strategy Standard for New Zealand Fisheries. Wellington, New Zealand.

Environmental Effects

Bycatch

There is very little bycatch of other fish - more than 90% of catches consist of oreo. The remainder of the catch is mostly other species managed under the QMS. Detailed reporting and catch balancing are required by law for QMS species.

Endangered, Protected & Threatened Species

Seabirds and marine mammals are often attracted to fishing vessels as an opportunistic source of food. New Zealand's oreo fisheries pose little risk to these animals and their populations. There have been no observed captures of New Zealand sea lions or protected shark species and incidental captures of New Zealand fur seals and seabirds occur only occasionally. In 2011-12 there were two estimated fur seal captures and eight estimated seabird captures. This very low level of risk is due to the nature of the oreo fisheries and resultant from the mitigation measures in place.[4]

All deepwater crews are trained to manage the risks to avoid interactions with seabirds and marine mammals, and mitigation devices are used to deter animals from unwittingly placing themselves in harm's way.

Deepsea corals in New Zealand are abundant and diverse and, because of their fragility, are at risk from bottom trawling. All deepsea corals are protected by law in New Zealand. Spatial management measures are employed to protect pristine and representative seabed habitats within the Exclusive Economic Zone (EEZ, see Benthic).

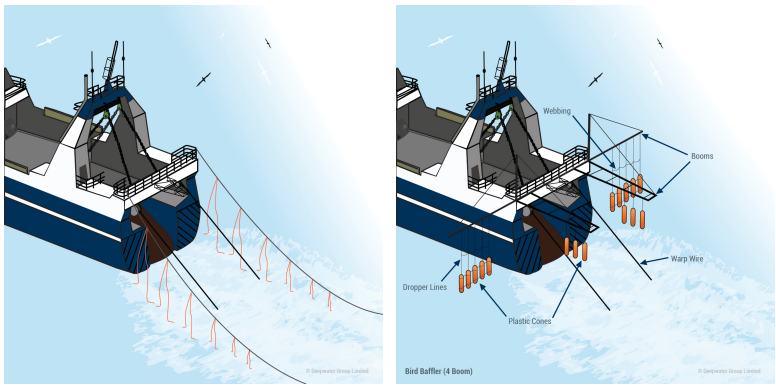

Figure 5 Seabird Mitigation Devices (Tori Line and Bird Baffler)

Benthic

Concerns have been raised about the impacts on benthic (seabed) communities from bottom trawls. Research and monitoring programmes are in place to assess the nature and extent of these impacts. MPI annually maps the trawl footprint of each of these oreo fisheries to monitor the extent of trawl interactions with the seabed and to provide a mechanism to identify if, and where, further management measures may be required. Research projects, such as the Oceans Survey 20/20 which used both acoustic mapping and underwater cameras to map New Zealand's marine biodiversity and habitat types, are increasing our knowledge and understanding of the benthic environment and of the nature and location of the different habitat types within New Zealand's large EEZ. These results are used to inform management decisions. Key fishing grounds, such as the Chatham Rise, have been the focus of many of these studies.

[4] http://deepwatergroup.org/wp-content/uploads/2014/10/Orange-Roughy-Oreo-Operational-Procedures-2014-15.pdf
http://deepwatergroup.org/wp-content/uploads/2014/10/VMP-Operational-Procedures-2014-15.pdf
http://deepwatergroup.org/wp-content/uploads/2014/10/Marine-Mammals-Operational-Procedures-2014-15.pdf
http://deepwatergroup.org/wp-content/uploads/2014/10/Reporting-Operational-Procedures-2014-15.pdf

To mitigate any impacts, MPI and DWG have also developed and implemented a programme of spatial management which includes:

- Benthic Protection Areas (BPAs) – where bottom trawling is prohibited[5]
- 'Seamount' Closures – where commercial fishing is prohibited.

In total, 30% of New Zealand's EEZ is closed by law to bottom trawling. These closures are recognised by the international community as contributing (~10%) to global marine protection and have been cited as best practice.[6] [7] They constitute one of the largest bottom trawl closures within any EEZ in the world. To give context to the size of the total area closed, New Zealand's BPA network protects over four times the area of New Zealand's landmass. In total, the BPA and 'Seamount' Closures protect:

- 28% of Undersea Topographic Features (including seamounts)
- 52% of seamounts (underwater mountains over 1,000 m in height)
- 88% of active hydrothermal vents
- 17% of oreo habitat (based on oreo depth range).

New Zealand's oreo fishing grounds have been progressively developed over the past three decades and there is now relatively little exploratory fishing over new grounds. These fisheries are now primarily supported by relatively small, localised areas, which sustain high catch rates year on year. More than 99% of the seabed within New Zealand's maritime zone (EEZ and Territorial Sea) has never been contacted by trawls targeting oreo.[8] Only 0.03% of the seabed is contacted by oreo trawls each year.

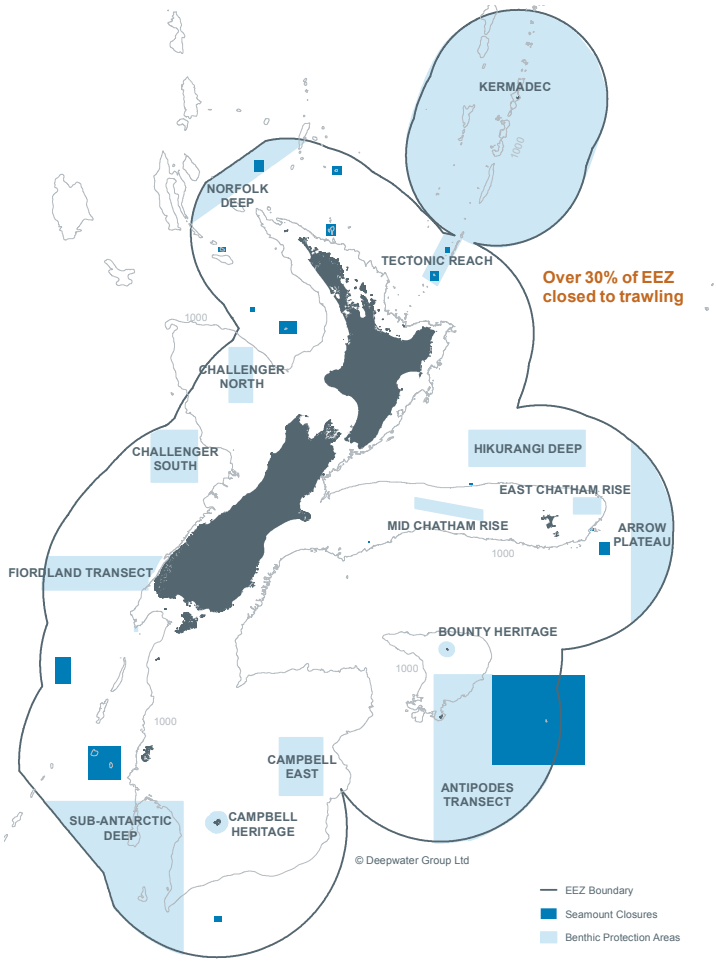

Figure 6 New Zealand's Benthic Protection Areas and 'Seamount' Closures

[5] Helson, J., et al. (2010). Private rights, public benefits: industry-driven seabed protection. Marine Policy 2011 34:557-566

[6] Juffe-Bignoli, D. et al. (2014). Protected Planet Report 2014. UNEP-WCMC: Cambridge, UK.

[7] Spear, B. and Cannon, J. (2012). Benthic Protection Areas: Best Practices and Recommendations. Sustainable Fisheries Partnership Report.

[8] Black, J., et al. (2013). Monitoring New Zealand's Trawl Footprint for Deepwater Fisheries: 1989-90 to 2009-10. New Zealand AEBR Report No.110

Fisheries Management

New Zealand's Quota Management System (QMS)

OEO3A and OEO4 were first managed under quota in 1982 and, along with OEO1 and OEO6, were introduced into the QMS in 1986. New Zealand has implemented the most extensive quota-based fisheries management system in the world, with over 100 species or species-complexes of fish, shellfish and seaweed now managed within this framework. Almost all commercially targeted fish species within New Zealand's waters are managed within the QMS. For deepwater fisheries, the status of the stocks of each of the main fisheries has been determined using the best available scientific information.

MPI and industry contract fisheries scientists to collect and analyse scientific information, supported by data collected from commercial fishing activities, to inform management advice, and employs fisheries managers to advise the Minister for Primary Industries on the appropriate harvest strategies and catch levels. Total Allowable Commercial Catches (TACCs) are set by the Minister based on the best available scientific information and the advice provided by fisheries managers, in consultation with quota owners and other external stakeholders.

At an operational level, the oreo fisheries are managed in accordance with the National Fisheries Plan for Deepwater and Middle-depth Fisheries.[9]

New Zealand recently became one of only two fishing jurisdictions to achieve a top ranking in a review of fisheries management systems around the world.[10] In a second study, New Zealand was ranked first for managing marine resources among the 53 major fishing nations that were assessed.[11]

Collaborative and Participatory Processes

Since 2006, DWG and MPI have operated within a formal partnership that enables collaboration in the management of New Zealand's deepwater fisheries, including the oreo fisheries.[12] This partnership has directly facilitated improvements to the management of oreo fisheries in almost all respects.

Compliance and Enforcement

MPI maintains a comprehensive compliance programme. This includes both effective deterrents and encouragement of compliance. MPI's Voluntary Assisted Directed and Enforced (VADE) compliance model enables the effective, informed and assisted compliance model which ensures support for and understanding of the fisheries management regime by industry participants. Since 1994 all vessels over 28 m have been required by law to be part of the Vessel Monitoring System (VMS) which, through satellite telemetry, enables MPI to monitor all deepwater vessel locations at all times. In combination with at-sea and air surveillance, supported by the New Zealand joint military forces, the activities of deepwater vessels are monitored and verified to ensure compliance with both regulations and with industry-agreed operating procedures.

All commercial catches from QMS stocks must be reported and balanced against ACE at the end of each month. It is illegal to discard or to not report catches of QMS species. MPI audits commercial vessels' catch, effort and landing reports, reconciles these against multiple sources to ensure that all catches are reported and documented correctly.

The level of surveillance of deepwater vessels is high. Any vessel operator who breaches the law faces prosecution and mandatory penalties, including automatic forfeiture of vessel and quota.

[9] Ministry for Primary Industries. (2014). National Deepwater and Middle-depth Fisheries Plan - Part 1B Oreo Fishery. Wellington, New Zealand: Author.

[10] Worm, B., Hilborn, R., et al. (2009). Rebuilding Global Fisheries. Science 325 (5940): 578-585.

[11] Alder, J., Cullis-Suzuki, S., et al. (2010). Aggregate performance in managing marine ecosystems of 53 maritime countries. Marine Policy 34 (3): 468-476.

[12] Ministry of Fisheries and Deepwater Group Ltd. (2010). Memorandum of Understanding for the Deepwater Fisheries Management Partnership. 8p.

Research Plan

In 2009, DWG proposed that the industry's science and research programme should be integrated with that undertaken by the Ministry to form a single, integrated 10-Year Research Programme that would be:

- *Management Led* – to ensure collection of adequate science-based information to underpin sustainable management decisions
- *Comprehensive* – increase the annual investment by MPI in deepwater science and information by 50% including more research surveys, more stock assessments, more stock characterisations, and greater observer coverage
- *Environmentally Sound* – including enhanced monitoring of interactions between the deepwater fleet and protected species, regular Ecological Risk Assessments to scientifically determine where fishing activities are causing risk of harm to the marine environment.
- *Cost Efficient* – reduce service delivery costs through public tender and multi-year contracts.

In 2010, MPI implemented this 10-Year Research Programme to improve both the information to underpin management decisions and the efficiencies in science service provision. This programme is currently being reviewed and enhanced.

Certified Sustainable

It's not enough to simply tell people New Zealand's fisheries are sustainable, quota owners also seek to verify this through third-party assessment. To fulfill this commitment, DWG and MPI have embarked on an ambitious programme to have all our main fisheries, including those for oreo, certified as sustainable under the Marine Stewardship Council's (MSC) programme, the international 'gold standard' for sustainable fisheries performance.[13]

DWG and MPI have embarked on a Fisheries Certification Programme with the objective of lifting the performance of information for each major deep water fishery to a level that will meet the MSC Fisheries Standard. The three main oreo fisheries are being preparing to enter into MSC assessment. Pre-assessments have been undertaken and formal Fisheries Improvement Projects to enable MSC certification to be achieved are in the final stages of development.[14]

Deepwater Group

DWG is a non-profit organisation that represents the interests of deep water quota owners, working in partnership with MPI to ensure that New Zealand gains the maximum economic yields from the deep water fisheries resources, managed within a long-term sustainable framework.

We represent participants in New Zealand's major deep water commercial fisheries, including 94% of oreo quota owners.

Visit our website for copies of references and to learn more:

www.deepwatergroup.org

[13] www.msc.org

[14] www.deepwatergroup.org/species/oreo/oreo-fisheries-improvement-projects/