Fisheries New Zealand
Tini a Tangaroa

Annual Review Report for Deepwater Fisheries

2018/19

Fisheries New Zealand Discussion Paper No: 2020/01

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ISBN No: 978-1-99-001777-3 (online)
ISSN No: 2624-0246 (online)

March 2020

New Zealand Government

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1. Introduction

1.1 OVERVIEW OF NEW ZEALAND'S DEEPWATER FISHERIES

New Zealand's deepwater and middle-depth fisheries (deepwater fisheries) predominantly occur in offshore waters beyond the 12 nautical mile (NM) limit of the territorial sea out to the 200 NM limit of the exclusive economic zone (EEZ). Total FOB[1] export revenues from deepwater fisheries during the 2019 calendar year exceeded $850 M.

The management of New Zealand's deepwater fisheries is a collaborative arrangement between Fisheries New Zealand (representing the Crown and its statutory obligations to the public) and the commercial fishing industry, represented by the Deepwater Group Ltd (DWG).[2] This arrangement allows for Management Objectives outlined in the National Fisheries Plan for Deepwater and Middle-depth Fisheries to be achieved by drawing on the combined knowledge, experience, capabilities and perspectives of both organisations.

Within the deepwater fisheries portfolio, fish species have been ranked into three tiers, according to their commercial importance (Table 1). Tier 1 species are high volume and/or high value fisheries and are usually targeted. Tier 1 species are important export revenue earners, which is reflected in the high quota value associated with these stocks. Tier 2 species are typically only target fisheries at certain times of the year and/or are important bycatch taken in fisheries targeting Tier 1 species. Tier 3 species are those caught as incidental bycatch that are not managed through the quota management system.

Table 1: Categorisation of deepwater species by Tier.

Deepwater species[3]		
Tier 1 stocks	Hake: all Hoki: all Jack mackerel: JMA 3 & JMA 7 Ling: LIN 3 – LIN 7 Orange roughy: all	Oreo: all Southern blue whiting: all Scampi: all Squid: all
Tier 2 stocks	Alfonsino: all Black cardinalfish: all Barracouta: BAR 4, BAR 5 & BAR 7 Blue (English) mackerel: EMA 3 & EMA 7 Dark ghost shark: GSH 4 – GSH 6 Deepwater crabs (KIC/GSC/CHC): all Frostfish: FRO 3 – FRO 9 Gemfish: SKI 3 & SKI 7 Lookdown dory: all Pale ghost shark: all	Patagonian toothfish: all Prawn killer: all Redbait: all Ribaldo: RIB 3 – RIB 8 Rubyfish: all Sea perch: SPE 3 – SPE 7 Silver warehou: all Spiny dogfish: SPD 4 & SPD 5 White warehou: all
Tier 3 species	Non-QMS species	

[1] FOB - Free on board. The value of export goods, including raw material, processing, packaging, storage and transportation up to the point where the goods are about to leave the country as exports. FOB does not include storage, export transport or insurance cost to get the goods to the export market. https://www.seafood.org.nz/publications/export-information/

[2] Shareholders of DWG collectively hold over 90% of deepwater quota shares.

[3] For some species (e.g. ling and jack mackerel), management of some stocks falls under the National Deepwater Plan while the remainder are managed under the draft National Inshore Finfish Fisheries Plan.

1.2 NATIONAL DEEPWATER PLAN WIDER CONTEXT AND STRUCTURE

Since 2010, the management of New Zealand's deepwater fisheries has been implemented through the National Fisheries Plan for Deepwater and Middle-depth Fisheries (National Deepwater Plan).[4] At a conceptual level, the National Deepwater Plan sits within a hierarchy of fundamental legislation including the Fisheries Act 1996 (the Act) and Treaty of Waitangi obligations to Māori.

The National Deepwater Plan consists of three parts (Figure 1), which are divided into strategic direction and objective setting (Parts 1A and 1B) and annual operational cycles (Parts 2 and 3).

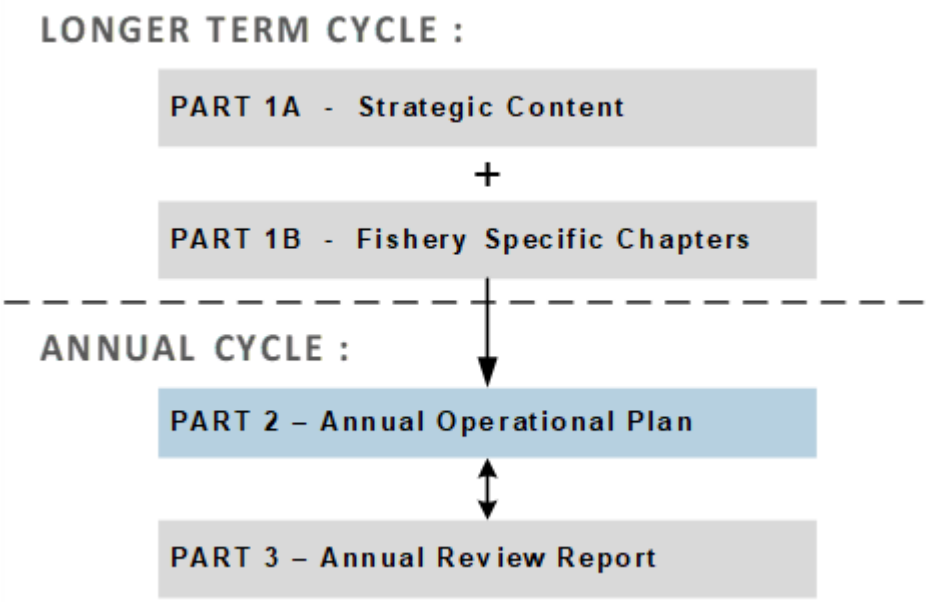

Figure 1: The three components of the National Deepwater Plan.

Part 1 of the National Deepwater Plan establishes the enabling framework for the management of New Zealand's deepwater fisheries. Part 1 of the National Deepwater Plan is further divided into two parts, Part 1A and Part 1B.

Part 1A of the National Deepwater Pan was approved by the Minister of Fisheries under section 11A of the Fisheries Act 1996. This means that it must be considered each time the Minister makes decisions or recommendations concerning regulation or control of fishing or any sustainability measures relating to the stocks managed through this plan.

Part 1A details the overall strategic direction for New Zealand's deepwater fisheries. Specifically it describes;

1. The strategic context and operating environment that fisheries plans are part of, including legislative requirements and government priorities;
2. Management objectives that will apply across all deepwater fisheries (Figure 2); and
3. How the fisheries plan will be implemented, including the approach to engaging with stakeholders.

Part 1A was updated in 2019 to reflect changes and developments since it was first published by the Ministry of Fisheries. The 2019 iteration of Part 1A contained revised management objectives, structure and content, however the high level structure of the National Deepwater Plan, including the fisheries specific chapters, and annual planning and review processes (as described in this section) remained the same.

[4] Available at https://www.mpi.govt.nz/dmsdocument/3967-national-fisheries-plan-for-deepwater-and-middle-depth-fisheries-2019

Use Outcome: Fisheries resources are used in a manner that provides greatest overall economic, social and cultural benefit.	
1	Ensure the deepwater and middle-depth fisheries resources are managed so as to provide for the needs of future generations
2	Ensure excellence in the management of New Zealand's deepwater and middle-depth fisheries so they are consistent with, or exceed, international best practice
3	Ensure effective management of the deepwater and middle-depth fisheries is achieved through the availability of appropriate, accurate and robust information
4	Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy or reference points
Environment Outcome: The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use	
5	Ensure that maintenance of biological diversity of the aquatic environment and protection of habitats of particular significance for fisheries management are explicitly considered in management
6	Manage deepwater and middle-depth fisheries to avoid, remedy or mitigate the adverse effects of these fisheries on associated or dependent and incidentally caught fish species
7	Manage deepwater and middle-depth fisheries to avoid, remedy or mitigate the adverse effects of these fisheries on the benthic habitat
8	Manage deepwater and middle-depth fisheries to avoid, remedy or mitigate the adverse effects of these fisheries on the long-term viability of endangered, threatened and protected species populations
Governance Outcome: Sound governance arrangements that are well specified, transparent, and which support cost-effective and accountable decision-making	
9	Ensure the management of New Zealand's deepwater and middle-depth fisheries meets the Crown's obligations to Māori
10	Ensure there is consistency and certainty of management measures and processes in the deepwater and middle-depth fisheries
11	Ensure New Zealand's deepwater and middle-depth fisheries are transparently managed

Figure 2: Outcomes and Management Objectives of the National Deepwater Plan (2019).

Part 1B comprises the fishery-specific chapters of the National Deepwater Plan, which provides management objectives at the fishery level, in line with the management objectives outlined in Part 1A. Fishery-specific chapters describe the operational objectives for target fisheries and the key bycatch species, and how performance against objectives will be assessed at the fishery level.

To date, fishery-specific chapters have been completed for the hoki, orange roughy, oreo, hake, ling, jack mackerel, and southern blue whiting fisheries.[5] Under the National Deepwater Plan 2019, fishery-specific chapters previously completed will be updated, and chapters for the scampi and squid fisheries developed. Following public consultation, fishery-specific chapters will be provided to the Minister of Fisheries for approval.

Part 2 of the National Deepwater Plan consists of an Annual Operational Plan (AOP) which details the management actions that will be implemented on an annual basis for deepwater fisheries. It also

[5] Fisheries-specific chapters are available at http://www.mpi.govt.nz/growing-and-harvesting/fisheries/fisheries-management/deepwater-fisheries

includes the required services, delivery mechanisms, and service prioritisation factors that must be considered each financial year.

The AOP is primarily an internal planning and prioritisation document so will not be approved by the Minister of Fisheries under section 11A. However, advice will be provided to the Minister regarding any statutory interventions required to regulate deepwater fisheries.

Part 3 of the National Deepwater Plan is the Annual Review Report (ARR), which assesses progress during the previous financial year towards meeting the year's management priorities, by reviewing delivery of the relevant AOP. The ARR also reports on the annual performance of deepwater fisheries during the previous fishing year in relation to environmental interactions and impacts. The contents and structure of this ARR are described in the following section.

1.3 THE 2018/19 DEEPWATER ANNUAL REVIEW REPORT

This Annual Review Report is split into three parts:

Part 3A describes the progress that has been made during the 2018/19 financial year (1 July 2018 – 30 June 2019) towards delivering the management actions set out in the 2018/19 AOP.[6]

Achievement of these annual priorities contributes to meeting the high level management objectives set out in Part 1A of the National Deepwater Plan.

Part 3B provides detail on delivery of fisheries service's relevant to Deepwater Fisheries Management that are planned by financial year. These processes include the planning and contracting of fisheries and conservation research projects, planning observer coverage on the deepwater fleet and the cost recovery regime.

Part 3C provides a summary report of the combined environmental impacts of deepwater fishing activity, and the deepwater fleet's adherence to the suite of non-regulatory management measures in place during the 2018/19 October fishing year (1 October 2018 – 30 September 2019).

Most deepwater stocks are managed under an October fishing year. The period encompassed by the 2018/19 October fishing year does not align with the financial year as are shown in Figure 3 below.

			2018						2019						
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

2018/19 Financial year
2018/19 Fishing year

Figure 3: The months encompassed by the 2018/19 financial year and fishing year respectively.

This Annual Review Report also contains several appendices:

- Appendix I summarises the catch of deepwater stocks during the 2018/19 fishing year. Also included, where available, are observer coverage details, the amount of deemed values invoiced and export earnings during the 2018 calendar year;
- Appendix II summarises the results of the October 2018 and April 2019 sustainability rounds;
- Appendix III summarises landings of all Tier 3 (non-QMS) species by the core deepwater fleet[7] between the 2014/15 and 2018/19 fishing years;
- Appendix IV comprises The Deepwater Fish Plan Advisory Group (FPAG) Terms of Reference;

[6] The Annual Operational Plan for Deepwater Fisheries 2018-19 can be accessed online; https://www.mpi.govt.nz/dmsdocument/30828-annual-operational-plan-for-deepwater-fisheries-201819

[7] The core deepwater fleet is defined as all bottom longline vessels > 34 m in length, all trawl vessels > 28 m in length which are regularly used to target deepwater species and all vessels used to target scampi (regardless of length).

- Appendix V summarises cost recovery levies for deepwater stocks for the 2018/19 financial year; and
- Appendix VI comprises the observer Interim Trip Report template.

2. Part 3A: Progress on Management Actions

2.1 MANAGEMENT ACTIONS DELIVERED BY DEEPWATER FISHERIES MANAGEMENT

The 2018/19 AOP identified 17 management actions that aimed to progress delivery of the management objectives specified in Part 1A of the National Deepwater Plan 2019. Table 2 summarises progress relating to each of these management actions. For reference, both the 2018/19 core and key management actions are listed in the grey boxes in Table 2.

Table 2: Management actions to be delivered by Deepwater Fisheries Management during the 2018/19 financial year

1	**Fisheries Sustainability Controls:** Review catch limits and management settings as required
	Deepwater sustainability decisions consist primarily of reviews to catch limits (TACs[8] and TACCs[9]) and deemed value rate settings across the fish stocks managed within the National Deepwater Fisheries Plan. Reviews are completed in two rounds; one for stocks managed with a fishing year beginning on 1 October and a second for stocks with a fishing year beginning on 1 April. Additionally, conversion factors are subject to ongoing monitoring by comparing observer data to the gazetted conversion factors. If a conversion factor for a certain species and product state is reviewed, the proposal will be consulted on. Changes to conversion factors are Fisheries New Zealand decisions and the process does not have to run to the same timeframes as the sustainability rounds.

	Key Actions for 2018/19:
	• Stocks undergoing assessment during 2018/19 to be considered for review;
	  • October 2018: HOK 1, HAK 1, LIN 5, LIN 6, ORH 3B, OEO 4 & SCI 3; and
	  • April 2019: SBW 6B.

	Action linked to Management Objectives 1, 2, 3, 4, 9 & 10.
	Actions achieved: For the 1 October 2018 sustainability round, catch limits were reviewed and changed for four deepwater stocks: • LIN 5 - The TAC was increased from 4,036 tonnes to 4,834 tonnes. The reviewed TAC consisted of a 4,735 tonne TACC (increased from 3,955 tonnes), a 97 tonne allowance for other sources of fishing-related mortality (set at 2% of the TACC, increased from 79 tonnes), the retention of a 1 tonne Māori customary fishing allowance and the retention of 1 tonne allowance for recreational fishing interests. • OEO 4 – The TAC was increased from 3,150 tonnes to 3,780 tonnes. The reviewed TAC consisted of a 3,600 tonne TACC (increased from 3,000 tonnes) which included a

[8] Total allowable catch.

[9] Total allowable commercial catch.

	2,600 tonne voluntary smooth oreo catch limit, a 180 tonne allowance for other sources of fishing-related mortality (increased from 150 tonnes) and the retention of a zero tonne allowance for Māori customary fishing and recreational fishing interests. • ORH 3B – The TAC was increased from 5,470 tonnes to 6,413 tonnes. The reviewed TAC consisted of a 6,091 tonne TACC (increased from 5,197 tonnes), a 317 tonne allowance for other sources of fishing-related mortality (increased from 268 tonnes), the retention of a 5 tonne allowance for customary Māori fishing and the retention of a zero tonne allowance for recreational fishing interests. The increase to the ORH 3B TACC applied only to the East and South Chatham Rise sub-area with the catch limit increasing from 3,100 tonnes to 4,095 tonnes. Alongside the increase to the East and South Chatham Rise sub-area catch limit, the Northwest Chatham Rise sub-area catch limit decreased from 1,250 tonnes to 1,150 tonnes.[10] All other ORH 3B sub-area catch limits were unchanged. • SCI 3 – The TAC was increased from 357 tonnes to 428 tonnes. The reviewed TAC consisted of a 408 tonne TACC (increased from 340 tonnes), a 20 tonne allowance for other sources of fishing-related mortality (increased from 17 tonnes) and the retention of a zero tonne allowance for Māori customary fishing and recreational fishing interests. • The deemed value rates of two deepwater stocks (SKI 3 and SKI 7) were reviewed during the October 2018 sustainability round. The annual deemed value rates of both stocks were reduced from $1.29/kg to $0.72/kg. No change was made to the interim deemed value rates or either stock. The differential schedule of both stocks remained unchanged however the rate at each step on the schedule changed in proportion to the decrease in the annual rate. For the 1 April 2018 sustainability round, no catch limits or deemed value rates were reviewed for deepwater stocks: For the 1 October 2019 sustainability round, consultation and decision documents were prepared for seven deepwater stocks; HAK 7, HOK 1, LIN 7, ORH 3B, ORH 7A, SKI 3 & SKI 7. The Deepwater Fisheries Management team also provided input towards the review of deemed value settings for the 1 October 2019 sustainability round. For the 1 October 2019 sustainability round, six deepwater stocks underwent deemed value rate review (CDL 5, RBY 5, RBY 6, JMA 7, SWA 3 & SWA 4). As at 1 October 2019, vessel specific conversion factor certificates had been issued to operators of ten deepwater vessels. The annual review process resulted in amended certificates being issued for nine of the 10 vessels during the 2018/19 financial year. No changes were made to any gazetted conversion factors during the 2018/19 financial year.

2	**Fisheries Planning:** Implement updated National Deepwater Plan
	The National Deepwater Plan 2019 was approved during 2018/19 following public consultation in 2017. Implementation of the National Deepwater Plan for the 2018/19 financial year included the core activities listed below.
	Core Actions for 2018/19: • Compile the Annual Review Report for 2017/18; • Develop the Annual Operational Plan for 2019/20; and

[10] Prior to 1 October 2018, 207 tonnes of the 1,250 tonne Northwest Chatham Rise catch limit was foregone. This arrangement was not continued for the 2018/19 fishing year, therefore the available catch limit increased by 107 tonnes from 1 October 2018 despite a 100 tonne decrease in the actual catch limit.

	• Develop and review species-specific chapters for the Deepwater Fisheries Plan (hoki, hake & ling, scampi).
	Action linked to all Management Objectives
	Actions achieved: • The National Deepwater Pan 2019 was approved by the Minister of Fisheries in May 2019; • The Annual Review Report for 2017/18 was completed and made available in February 2018;[11] • The Annual Operational Plan for 2019/20 was completed and made available in August 2019;[12] and • Development of species specific chapters commenced for orange roughy, scampi, southern blue whiting and squid.

3	**Ministerial Services**: Ensure timely completion of all Ministerial correspondence and communication requests assigned to the Deepwater Fisheries Management team
	The timely completion of all Ministerial correspondence and communication requests is a core government function and will be given priority attention throughout the year to ensure that all response timeframes are met.
	Core Actions for 2018/19: This management actions refers to Fisheries New Zealand's responsibility to: • Provide quality advice and information to the Minister of Fisheries; and • Maintain an open relationship with stakeholders and the public and respond to all Official Information Act (OIA) requests and Government correspondence regarding deepwater fisheries issues in a timely manner.
	Action linked to Management Objectives 9, 10 & 11
	Actions achieved: During the 2018/19 financial year, the Deepwater Fisheries Management team completed: • Six Aide Memoires; • Six Briefing Papers; • Six Ministerials; • One Submission to Cabinet; and • One Written Parliamentary Question. In November 2014, the Official Information Act (OIA) team was established and has taken over responsibility for drafting responses to OIA requests. In 2018/19, the Deepwater Fisheries Management team contributed to the completion of OIA requests as subject matter experts, providing advice and appropriate review of information.

[11] The Annual Review Report for Deepwater Fisheries 2017/18 can be accessed online; https://www.mpi.govt.nz/dmsdocument/33340-annual-review-report-for-deepwater-fisheries-201718

[12] The Annual Operational Plan for Deepwater Fisheries 2019/20 can be accessed online; https://www.mpi.govt.nz/dmsdocument/36804-annual-operational-plan-for-deepwater-fisheries-201920

4	**Engagement:** Ensure sufficient and appropriate engagement with tangata whenua and stakeholders
	Sufficient and appropriate engagement with tangata whenua and stakeholders is an integral part of fisheries management. Engagement aims to ensure Deepwater Fisheries Management information is available and accessible for all stakeholders and to provide opportunity for input and participation in the deepwater fisheries planning process and the ongoing management of deepwater fisheries for tangata whenua.
	Key Actions for 2018/19 • Develop iwi engagement plan. **Core Actions for 2018/19:** • Ensure input and participation of tangata whenua and address issues as necessary; • Maintain an open and transparent management environment by ensuring that all management information is available and accessible online for stakeholder and tangata whenua consideration; • Engage with stakeholders on environmental issues relating to the management of deepwater fisheries through the biannual Fisheries Plan Advisory Group; and • Advise Fisheries New Zealand representatives attending Iwi Fisheries Forums of upcoming consultations.
	Action linked to all Management Objectives
	Actions achieved: • Fisheries Plan Advisory Group meetings were held in November 2018 and April 2019; • A Terms of Reference for the Fisheries Plan Advisory Group was developed and agreed by all members (Appendix IV); • A Deepwater Vessel Operators meeting was held in March 2019. • A scampi quota holders and operators meeting was held in April 2019. • The independently chaired Deemed Values Working Group comprising Fisheries New Zealand/MPI officials, representatives of the commercial fishing industry, iwi representatives and an independent economist began a review of the operation of the deemed values regime. • All information relating to the management of deepwater fisheries was made available online; and • Directed efforts were made to engage with tangata whenua for all deepwater fisheries consultations throughout the year, including the distribution of all sustainability round advice papers to iwi and iwi forums (in particular Te Waka a Maui and Te Tau Ihu). In addition, relevant specific objectives from Iwi Fisheries Plans (IFPs) and Forum Fisheries Plans (FFPs) were incorporated into sustainability round advice to the Minister.

5	**Protected Species Frameworks – NPOA-Seabirds:** Work collaboratively with the Department of Conservation to achieve the five year practical, biological, research and development, and international objectives within deepwater fisheries
	The National Plan of Action – Seabirds (2013) to reduce the incidental catch of seabirds in New Zealand Fisheries (NPOA-Seabirds)[13] sets out the long term and five year objectives, relating to managing fisheries interactions with seabirds. The NPOA-Seabirds (2013) is underpinned by the seabird risk assessment, which identifies the seabird species considered to be most at risk of being adversely affected by commercial fishing in New Zealand.[14] The risk assessment also identifies which fisheries pose the most risk to seabird species. The NPOA-Seabirds (2013) is currently being revised in line with its five year term. This management action outlines the priority seabird work areas for deepwater fisheries in 2018/19 to give effect to the NPOA, as well as the work required to support the revision of the NPOA-Seabirds (2013). Further details on the objectives of the NPOA-Seabirds (2013) and how the Deepwater Fisheries Management team will support the achievement of those objectives can be found in Section 2.4 of this Report.
	Key Actions for 2018/19: • Contribute towards the revision of the NPOA-Seabirds (2013); and • Investigate and implement any additional practicable and effective measures to minimise the risk of seabird net captures based on the outcomes of the contracted project characterising trawl net captures and potential contributing factors. **Core Actions for 2018/19:** • Refer to Table 6 in Section 2.4: Implementation of the NPOA-Seabirds (2013).
	Action linked to all Management Objectives
	Actions achieved: During the 2018/19 financial year, the following actions relating to the NPOA-Seabirds were completed: • Actions relating to the implementation of the NPOA-Seabirds (2013) are detailed within Section 2.4 of this Report; • The project assessing the risk factors that influence the rate of seabird net captures on deepwater trawl vessels was contracted during the 2018/19 financial year. As such outputs are not yet available to inform potential mitigation measures; • Mitigation Standards,[15] which outline what is expected of effective mitigation practices, were developed (in conjunction with the Seabird Advisory Group) for four deepwater fisheries (>28 m trawl, scampi trawl, autoline and manual baiting bottom longline). Representatives from the Deepwater Fisheries Management team also contributed towards the development of Mitigation Standards for other fisheries (e.g. surface longline and <28 m trawl); and • In relation to revision of the NPOA-Seabirds (2013), drafts of the amended NPOA-Seabirds (2020) and a review of the NPOA-Seabirds (2013)[16] were provided to the Seabird Advisory Group for comment. Versions of both documents were also provided to the Minister of Fisheries and the Minister of Conservation in June 2019.

[13] The NPOA-Seabirds (2013) can be accessed online; https://www.mpi.govt.nz/dmsdocument/3962-national-plan-of-action-2013-to-reduce-the-incidental-catch-of-seabirds-in-new-zealand-fisheries

[14] The most recent (2020) iteration of the seabird risk assessment is available at https://www.mpi.govt.nz/dmsdocument/39407/direct

[15] https://www.mpi.govt.nz/protection-and-response/sustainable-fisheries/managing-our-impact-on-marine-life/seabirds/

[16] https://www.mpi.govt.nz/dmsdocument/38057-national-plan-of-action-seabirds-2013-review-document

6	**Protected Species Frameworks –** Work collaboratively with the Department of Conservation on implementation of the New Zealand sea lion/rāpoka Threat Management Plan 2017-2022
	The New Zealand sea lion Threat Management Plan prioritises management actions to enable the recovery of the New Zealand sea lion population.[17]
	Key Actions for 2018/19: • Develop fishery-specific approaches to understanding and managing commercial fisheries where the information regarding sea lion interactions and mitigation is less detailed i.e. scampi fisheries around the Auckland Islands (SCI 6A) and fisheries around the South Island and Stewart Island. **Core Actions for 2018/19:** • Work with the Department of Conservation (DOC) to implement the actions in the New Zealand sea lion/rāpoka Threat Management Plan; • Engage with key stakeholders at the New Zealand sea lion/rāpoka Forum and Advisory Group and the Squid 6T Operational Plan Technical Advisory Group; • Review sea lion research (disease, fisheries interactions, SLED efficacy and adult female sea lion diet) at the Aquatic Environment and Conservation Services Programme working groups; and • Update the Campbell Island southern blue whiting fishery (SBW 6I) Operational Plan.
	Action linked to Management Objectives 6 and 8
	Actions achieved: • The SBW 6I Operational Plan 2019 was reviewed, updated and finalised • Observer coverage of scampi fisheries around the Auckland Islands (SCI 6A) increased from 16% of tows in 2017/18 to 21% in 2018/19; • The third annual meeting of the New Zealand sea lion/rāpoka Forum took place at the Royal Albatross Centre, Dunedin on 11 June 2019, and the third annual meeting of the New Zealand sea lion/rāpoka Advisory Group took place at the Royal Albatross Centre, Dunedin on 13 June 2019; • On 26 March 2019, the Department of Conservation and Fisheries New Zealand held a full day workshop to discuss New Zealand sea lion work/research undertaken during year two of the New Zealand sea lion/rāpoka Threat Management Plan; • On 27 May 2019, the Department of Conservation and Fisheries New Zealand held a workshop to plan short and long-term sea lion research at Campbell Island; • The Squid 6T Operational Plan Technical Advisory Group met twice, on 4 December 2018 and 19 March 2019; and • Research was completed on: i. A spatial assessment of fisheries risk for New Zealand sea lions at the Auckland Islands; ii. The population effects of New Zealand sea lion mortality scenarios relating to the southern arrow squid fishery at the Auckland Islands; iii. Desktop estimation of New Zealand sea lion cryptic mortality in trawls using SLEDs; and iv. Simulating sea lion dives to assess the probability of post-exit drowning for sea lions exiting SLEDs.

[17] www.doc.govt.nz/nature/native-animals/marine-mammals/seals/new-zealand-sea-lion/docs-work/new-zealand-sea-lion-threat-management-plan

7	**National Plan Frameworks –** Work collaboratively with the Department of Conservation **and** Ministry of Foreign Affairs & Trade (MFAT**) to i**mplement components of the National Plan of Action for the Conservation and Management of Sharks 2013 (NPOA-Sharks) relevant to deepwater fisheries
	The NPOA-Sharks (2013) sets out six goals and accompanying five year objectives to support the management of sharks. A qualitative risk assessment of all shark species was completed in December 2014 and repeated in November 2017. The risk assessment informs ongoing prioritisation of shark management actions and research. This Management Action is focused on achieving objectives of the NPOA-Sharks, and addressing concerns for at-risk species identified in the risk assessments.[18] A review of the NPOA-Sharks (2013) began in 2018/19.
	Key Actions for 2018/19: • Support the review and revision of the NPOA-Sharks (2013), in consultation with stakeholders ; • Participate in the third Meeting of the Signatories to the CMS Sharks MOU in December 2018; and • Complete a review of the ban on shark finning, and implement any recommended changes **Core Actions for 2018/19:** • Engage with key stakeholders at meetings of the New Zealand Sharks Advisory Group; • Update and support delivery on the NPOA-Sharks Implementation Plan across the fisheries management directorate in conjunction with DOC and MFAT; • Continue to work with stakeholders to avoid captures of protected shark species in deepwater fisheries and maximise survival of captured protected shark species; • Engage as required on the CMS Sharks MOU (Memorandum of Understanding on the Conservation of Migratory Sharks);[19] • Continue to work with stakeholders to avoid captures of protected shark species in deepwater fisheries and maximise survival of captured protected shark species; and • Engage as required on the CMS Sharks MOU (Memorandum of Understanding on the Conservation of Migratory Sharks) and ensure that New Zealand's shark management is consistent with the Sharks MOU and its conservation plan.
	Action links to Management Objectives 6 and 8
	Actions achieved: During the 2018/19 financial year, the following actions relating to the NPOA-Sharks were completed: • The NPOA-Sharks 2013 review is ongoing, with an updated NPOA anticipated during 2020/21; • A New Zealand Sharks Advisory Group meeting was held in June 2018 to support the NPOA-Sharks review;

[18]The NPOA-Sharks is available at https://www.mpi.govt.nz/dmsdocument/1138-national-plan-of-action-for-the-conservation-and-management-of-sharks-2013 and the latest risk assessment is available at https://fs.fish.govt.nz/Page.aspx?pk=113&dk=24619

[19] The CMS Sharks website is available here (www.cms.int/sharks/en)

	• A review of the regulatory framework to eliminate shark finning[20] in New Zealand is ongoing; • The Deepwater Fisheries Management team continued to support delivery on the NPOA-Sharks Implementation Plan across the fisheries management directorate, in conjunction with DOC and MFAT; and • Fisheries New Zealand delegates participated in the 3rd Meeting of the Signatories to the CMS Sharks MOU in December 2018.

8	**Benthic Framework -** Benthic Invertebrates: Work collaboratively with the Department of Conservation to monitor and measure the nature and extent of benthic interactions with deepwater fishing activity
	The current approach to mitigating the effects of fishing on deepwater benthic communities is through the closure of large areas of the EEZ to bottom trawling.[21] The level of interactions between deepwater vessels and benthic invertebrates is monitored by Fisheries New Zealand observers. The trawl footprint is also monitored each year and the most recent information available is reported in Section 4.7 of this Report.
	Key Actions for 2018/19: • Support the development of objectives to guide the management of benthic impacts. **Core Actions for 2018/19:** • Monitor the trawl footprint of selected deepwater fisheries, report on any new areas trawled in the ARR and consider management action if required; and • Report in the ARR the volume and species (where possible) of selected benthic species captured and consider management action if required.[22]
	Action links to Management Objectives 5, 6 and 7
	Actions achieved: • Fisheries New Zealand contracts a research provider to map the annual trawl footprint for all Tier 1 species, and for deepwater fisheries overall. The latest finalised trawl footprint to be published included fishing up to the end of the 2016/17 fishing year.[23] The trawl footprint report included fishing up to the end of the 2017/18 fishing year is expected to be published in early 2020; • Research needs were identified to ensure that sufficient information is available to support the management of benthic impacts; and • Details of the 2017/18 trawl footprint and the volume of selected benthic species captures during the 2018/19 fishing year are reported in Section 4.7 of this Report.

[20] Shark finning is defined as the removal of the fins from a shark and disposal of the trunk at sea, but does not include the removal of the fins from a shark where the trunk is also retained for processing.

[21] The implementation of Benthic Protection Areas (BPAs) from 2007 onwards have effectively closed approximately 32% of New Zealand's EEZ to bottom trawling.

[22] The species whose quantities are reported in the ARR are primarily those that fishers are required to report on non-fish or protected fish species catch reports under the Fisheries (Reporting) Regulations 2017 (i.e. corals, sponges and bryozoans).

[23] Available at https://www.mpi.govt.nz/dmsdocument/37050-aebr-229-extent-of-bottom-contact-by-new-zealand-commercial-trawl-fishing-for-deepwater-tier-1-and-tier-2-target-species-determined-using-catchmapper-software-fishing-years-200817

9	**Deepwater Research Planning**: Finalise and agree research commitments for the 2018/19 year and determine future approach to research planning and procurement
	Contracts under the initial five year phase of the 10 Year Research Programme[24] concluded at the end of the 2014/15 financial year. The research required to manage deepwater fisheries is currently being contracted on an annual basis based on the long-term planning done as part of the 10 Year Research Plan.
	Key Actions for 2018/19: • Support Fisheries New Zealand to implement the new approach to research planning and procurement, including a return to longer term contracting for routine trawl surveys. **Core Actions for 2018/19:** • Finalise and agree the deepwater fisheries research programme, including any proposals for industry-led research, for delivery during the 2019/20 financial year before December 2018; and • Update the Medium-term Research Plan.
	Action linked to all Management Objectives
	Actions achieved: During the 2018/19 financial year, the following actions relating to research planning were completed: • Deepwater research for 2019/20 was planned and discussed with stakeholders at the Fish Plan Advisory Group meeting in November 2018; • The 5-year Medium-term Research Plan for Deepwater Fisheries was updated to enable long term planning of deepwater research.[25]

10	**Deepwater Monitoring:** Deepwater observer coverage/sampling requirements
	Observer coverage of deepwater fisheries is planned by financial year and is based on biological sampling requirements, international requirements and percentage-level coverage targets. Observer coverage is monitored throughout the year to ensure sufficient information is available to support stock assessments and to understand interactions with protected species.
	Key Actions for 2018/19: • Place observers on deepwater trawl vessels that are using the Modular Harvesting System (MHS) for the first time; and • Contribute towards the redesign of the Observer Non-fish Bycatch Form (and any other forms deemed necessary). **Core Actions for 2018/19:** • Liaise with industry to acquire quarterly fishing plans to support observer coverage planning; • Ensure observer briefing documents are up to date and that appropriate sampling is undertaken in accordance with biological targets; • Monitor biological sampling to ensure sampling targets are met; and

[24] Available at https://fs.fish.govt.nz/NR/rdonlyres/4B773297-672A-4C52-B0F5-F67EDAD00AAB/0/10YearResearchProgrammeSummary.pdf

[25] The Medium Term Research Plan for Deepwater Fisheries 2018/19 – 2022/23 is available online; https://www.mpi.govt.nz/dmsdocument/21746/loggedIn

- Develop the observer coverage plan for the 2019/20 financial year including updating sampling targets.

Action linked to all Management Objectives.

Actions achieved:

- To be approved under Regulation 71A of the Commercial Fishing Regulations, vessels must carry at least one observer on the first trip where MHS gear is to be used, and complete at least 10 observed tows. When operators have demonstrated that they have used the approved MHS gear correctly, the Manager Offshore Fisheries writes to the operator to inform them that they have met this condition. During the 2018/19 financial year, observers were placed on seven deepwater vessels using the Modular Harvesting System for the first time. During such trips, observers monitored 330 tows using MHS gear;
- The Observer Non-fish Bycatch Form was redesigned to collect additional information on where in fishing gear protected species were captured (with a focus on trawl nets) and to better differentiate between captures in fish gear and deck landings (where a seabird voluntarily lands on the vessel and is assisted from it by the observer/crew). The revised form, termed the Protected Species Interaction (PSI) form, has been deployed on all trips from 1 August 2019;
- The Deepwater Fisheries Management team also contributed to the revision of the tori line details form and a revised suite of bottom longline and surface longline catch effort forms;
- Quarterly fishing plans were requested from industry for the first, second and fourth quarters of the 2018/19 fishing year;
- Observer coverage was tracked over the course of the fishing year and compared against the plan (as set out in the 2018/19 AOP) to enable the prioritisation of observer coverage to ensure that biological sampling. and desired percentage-level coverage targets were met;
- Fortnightly meetings were held between the Deepwater Fisheries Management team and Fisheries New Zealand Observer Services to discuss future observer coverage needs, the prioritisation of species for biological sampling and any other issues arising from deepwater observer coverage; and
- The 2019/20 observer coverage plan, as well as biological sampling requirements for deepwater fisheries were both completed and made available within the 2019/20 AOP.

11	**Deepwater Monitoring:** Digital Monitoring (DM)

From 1 October 2017, most of the deepwater trawl fleet (vessels >28 m) have been required to use two of the three components of digital monitoring (position reporting and electronic catch reporting). All remaining fishers and vessels will likely be required to start using position and electronic catch reporting during the 2018/19 year.

Key Actions for 2018/19:

- Identify opportunities to use position reporting and electronic catch reporting data to enhance BAU actions undertaken by the DW team;
- Support industry initiatives to deploy cameras on deepwater vessels on a trial basis; and
- Engage with industry to support compliance with the digital monitoring catch reporting and positional reporting requirements.

Core Actions for 2018/19:

	• Work with Business Technology & Information Services team and the Digital Monitoring team to develop and implement data quality standards and specifications; • Review the information required to be reported by fishers under electronic catch reporting and consider amendments if required; and • Work with vessel operators to ensure all position reporting and electronic catch reporting requirements are well understood and implemented consistently.
	Action linked to all Management Objectives
	Actions achieved: During the 2018/19 financial year, the following actions in relation to digital monitoring were completed: • Rollout of ER/GPR for the remainder of the fleet commenced in January 2019; • Data quality standards and specifications were developed by Fisheries New Zealand and the process implemented (by FishServe); • Prior to implementation of the data quality process, a list of commonly occurring reporting errors was compiled for each deepwater operator. Operators were then contacted and invited to clarify any issues with the Deepwater Fisheries Management team; and • The process of use electronic reporting data to enhance actions undertaken by the Deepwater Fisheries Management team remained ongoing.

12	**Deepwater Monitoring:** Monitor adherence of the deepwater fleet to the range of measures in place to monitor and manage the effects of fishing activity on protected species and sharks
	A range of management measures, including some non-regulatory initiatives by DWG, are employed to monitor environmental interactions in deepwater fisheries and to reduce the risk of ongoing adverse effects on protected species populations. Measures are described in the following Operational Procedures or Plans (OPs);[26] • Marine Mammal Operational Procedures (DWG initiative); • Vessel Management Plans (VMPs) – Seabirds (DWG initiative); • Ling Bottom Longline LIN 2 -7 Operational Procedures – Seabirds (DWG initiative); • Scampi Fisheries Operational Procedures (DWG initiative); • Hoki Coastal Trawl Operational Procedures (DWG initiative); • Shark Operational Procedures (DWG initiative); and • SQU 6T/SBW 6I Operational Plans[27]
	Core Actions for 2018/19: • Monitor adherence of the deepwater fleet to management measures through Fisheries New Zealand observer coverage; • Work with DWG to update materials and methods used to educate crew on Operational Procedures and Plans; • Monitor protected species interactions across all trips via Fisheries New Zealand observer debriefs and reporting of trigger points;

[26] DWG operational documents can be accessed online; http://deepwatergroup.org/newsresources/op-manual/

[27] The Squid 6T/SBW 6I Operational Plans are covered as part of Management Action 5 (Protected Species Frameworks – Work collaboratively with the Department of Conservation on implementation of the New Zealand sea lion/rāpoka Threat Management Plan 2017-2022).

	• Report levels of adherence to Operational Procedures and Plans to stakeholders through the ARR; • Continue to support the training and outreach and awareness programme run by the DWG Environmental Liaison Officer (ELO); and • Update the SBW 6I Operational Plan.
	Action inks to Management Objectives 5, 6, 7, 8 and 11
	Actions achieved: • Details regarding the auditing and monitoring of adherence to Operational Procedures and Plans and VMPs by Fisheries New Zealand observers are detailed within Sections 2.4 and 4.1 of this Report; • The deepwater trawl VMP observer audit form was reviewed, with the revised form used on all trips on deepwater trawl vessels from July 2018 onwards; • The Deepwater Fisheries Management team contributed to the revision of the Marine Mammal, Ling Bottom Longline and Deepwater Trawl (Seabirds) Operational Procedures; • The SBW 6I Operational Plan was updated for the 2018 season; and • The DWG Environmental Liaison Officer (ELO) encourages improvement of offal control and mitigation device use and real time reporting of capture events, to reduce the risk of protected species captures. Details regarding vessel visits by the DWG ELO can be found in Table 6 of this Report.

13	**Deepwater Monitoring:** Monitor adherence to all non-regulatory measures in place to manage Tier 1 deepwater fish stocks at a sub-QMA level
	In conjunction with industry, Fisheries New Zealand has implemented a series of non-regulatory sub-area and/or species specific catch limits in the hoki, orange roughy, and oreo fisheries. In addition, hoki management areas (HMAs) have been created to reduce fishing mortality on juvenile hoki in important nursery areas.
	Key Actions for 2018/19: • Refining and automating tools to enable more efficient monitoring. **Core Actions for 2018/19:** • Continue auditing fleet adherence to sub-QMA catch limits and HMA requirements; • Report level of adherence to these measures to stakeholders through the ARR; and • Respond as required where sub-QMA catch limits are exceeded.
	Action linked to Management Objectives 2, 3 and 4
	Actions achieved: • Custom data reports, utilising electronically reported catch data, were used to monitor fleet adherence to sub-QMA catch limits for relevant hoki, orange roughy and oreo stocks; • Quarterly reports summarising fishing effort, estimated catch and hoki length frequency information from inside HMAs were compiled and provided to DWG. HMA reports also

	summarised fishing effort, estimated catch and hoki length frequency information from the immediate vicinity (i.e. 2 NM) of HMA boundaries; • The ORH 3B East and South Chatham Rise (ESCR) and SSO 3A sub-QMA catch limits were exceeded by 1% (48 tonnes) and 9% (109 tonnes) respectively during the 2018/19 fishing year. The Deepwater Fisheries Management team has worked with DWG to ensure that sub-QMA catch limits are not exceeded in subsequent years; and • Summaries of quarterly sub-QMA catch and HMA reports are provided within Appendix I of this Report.

14	**Registry Services:** Implement the Foreign Owned Vessels (FOVs)[28] registration process, High Seas Permit Applications and risk based observer coverage
	The Deepwater Fisheries Management team provides input to all advice papers relating to Fisheries New Zealand's consent to the registration of foreign owned vessels operating in deepwater fisheries under Section 103 of the Fisheries Act 1996. Fisheries New Zealand also co-ordinates the cross agency work programme for the implementation of requirements of the Fisheries (Foreign Charter Vessels and Other Matters) Amendment Act 2014 and will continue to assist the Fisheries New Zealand Registry Analyst and Observer Services with any changes to their respective processes and functions.
	Core Actions for 2018/19: • Provide analysis for each foreign-owned vessel registration application; • Provide input into High Seas Permit Applications; • Provide secretariat services to, and chair, the Inter-Agency Fisheries Group and Governance Group. The role of the secretariat is to set the agenda and report back on bi-monthly meetings, circulate papers in advance of the meetings, record the discussions and action points in the minutes, allocate responsibilities to follow up decisions and update the FOV Risk Register; and • Provide policy advice on FOV issues.
	Action linked to all Management Objectives
	Actions achieved: • The Deepwater Fisheries Management team coordinated the work programme of the Inter-agency Fisheries Group, which includes the Ministry of Business, Innovation and Employment (MBIE), Maritime New Zealand (MNZ) and members from a cross-section of key MPI directorates. The Inter-agency Fisheries Group met every two months to discuss and refine inter-agency data sharing to input into the risk profiling of fishing vessels to inform risk assessment of vessels and operators; • Input was provided to High Seas Permit Applications as required; • Reports were provided by the Deepwater Fisheries Management team on ten applications for FOV registration; and • Work began on updating the 2012 ‘Memorandum of Understanding’ relating to the sharing of information for fishing vessels, their crew, and other associated parties between MPI, MBIE and MNZ.

[28] The acronym FCV (foreign charter vessel) has been used historically, however, these vessels are more correctly identified as ‘foreign-owned’ and the acronym FOV (foreign owned vessel) will be used throughout this document.

15	**Fisheries Management Controls:** Regulatory amendments
	Progressing secondary amendments to secondary legislation such as regulations requires: analysis of options, drafting the documents required for the different components of the regulatory process such as the PIRA (preliminary impact and risk assessment), consultation documents, RIS (regulatory impact statement), providing advice and decisions documents. The process for creating or amending tertiary legislation such as circulars, is more straightforward and does not require a PIRA, a RIS or Cabinet/Ministerial approval.
	Core Actions for 2018/19: • Progress secondary or tertiary legislative amendments as required.
	Action linked to Management Objectives 1, 2, 9, 10 and 11
	Actions not applicable: • No regulatory amendments were required in 2018/19.

16	**Fisheries Management/Sustainability Controls:** Support existing approaches to market initiatives for New Zealand's deepwater seafood
	The primary component of this management action is working with DWG to support the requirements of the Marine Stewardship Council (MSC) assessment and certification process. Fisheries New Zealand supports industry to achieve and maintain certification of key deepwater fisheries, and progress performance of all Tier 1 deepwater fisheries towards meeting the MSC Standard.[29]
	Core Actions for 2018/19: • Provide information to support the development and implementation of Fisheries Improvement Plans for fisheries not yet assessed; and • Provide information for annual surveillance audits of SBW, LIN bottom longline, the HOK/HAK/LIN trawl complex and ORH fisheries in 2018.
	Action linked to Management Objectives 1, 2, 9 and 10
	Actions achieved: • Deepwater Fisheries Management provided data and support for the annual surveillance audit of orange roughy; • The successful re-certification of SBW, LIN BLL and the HOK/HAK/LIN trawl complex was announced in August 2018; and • Fisheries New Zealand also provided review of DWG Fisheries Improvement Plans.

[29] Information on the status of New Zealand's deepwater fisheries in the MSC programme can be found online; deepwatergroup.org/certification/

17	**Fisheries Sustainability Controls:** Develop and implement specific harvest strategies for Tier 1 species and management approaches for low information stocks, which enable economically viable deepwater and middle-depth fisheries over the long-term
	A harvest strategy defines a management target, soft and hard limits, a rebuild strategy and a harvest control rule for a stock. Often in developing a harvest strategy, a management strategy evaluation will be undertaken which assesses a range of different management strategies, including those which incorporate economic aspects of the fishery.
	Key Actions for 2018/19: • Support delivery of a management strategy evaluation for scampi; and • Contribute to Fisheries New Zealand's Low Information Stock Project.
	Action linked to Management Objectives 1, 2, 3 and 4
	Actions achieved: • The primary focus of Fisheries New Zealand's Low Information Stock Project is inshore stocks. The Deepwater Fisheries Management team continues to monitor this project; and • The Harvest Control Rule for ORH 3B, and agreed harvest strategies for HOK 1 continue to be applied. **Actions not achieved:** • The management strategy evaluation for scampi has yet to be contracted.

2.2 MANAGEMENT ACTIONS DELIVERED IN CONJUNCTION WITH OTHER TEAMS WITHIN FISHERIES NEW ZEALAND AND MPI

Management Actions that the Deepwater Fisheries Management team contributed towards delivery of, but were led by other directorates within Fisheries New Zealand or MPI branches/directorates outside of Fisheries New Zealand are summarised in Table 3 below.

Table 3: Management Actions that the Deepwater Fisheries Management team contributed to during the 2017/18 financial year

A	**Input to work wider strategic MPI projects:** Assist relevant branches within MPI with review of policy developments and any necessary fisheries management information **Lead: Project dependent (see below)**
	MPI's Policy and Trade branch is leading the Fisheries Change Programme, which is expected to make significant improvements to how our fisheries are managed.[30] These projects require information, feedback, and review of working documents. The programme is split into three sections: short-term work looking at policy settings needed to support implementation of digital monitoring and innovative trawl technology projects; and medium and long-term sections that includes topics such as ecosystem-based fisheries management.
	Core Actions for 2018/19: • Contribute to policy development as required.
	Action linked to all Management Objectives

[30] Information on the Fisheries Change Programme (formerly known as the Future of our Fisheries Programme) is available at https://www.fisheries.govt.nz/protection-and-response/sustainable-fisheries/strengthening-fisheries-management/fisheries-change-programme/

	Actions achieved: • The Deepwater Fisheries Management team contributed towards the continuing development of Enabling Innovative Trawl Technology (EITT) and MHS regulations and requirements; • The Deepwater Fisheries Management team provided fisheries management advice to MPI Fisheries Policy and the Overseas Investment Office (OIO) on an application by a foreign owned company to purchase quota and/or ACE for deepwater stocks; • Input was provided to the Fisheries Change Programme as required; and • Management actions relating to the implementation of digital monitoring are reported in Table 2 above (Management Action 11).

B	**Research Monitoring and Evaluation:** Ensure that all information used in management decisions meets the requirements of the Research and Science Information Standard for New Zealand Fisheries (the Research Standard) [31] **LEAD: Fisheries New Zealand Science (Stock Assessment and Aquatic Environment)**
	The Deepwater Fisheries Management team will continue to be closely involved in the monitoring and evaluation of all research projects that relate to deepwater fisheries.
	Core Actions for 2018/19: • Assist Fisheries Science to deliver outputs of all 2018/19 research projects as listed in Section 3.2 of this Report; and • Assist Fisheries Science to ensure that all research used to support the management of deepwater fisheries is assessed against the Research Standard.
	Action linked to all Management Objectives
	Actions achieved: • All science information used to support management was reviewed by Fisheries Assessment Working Groups and determined to have met the Research Standard; and • Deepwater fisheries research was contracted as required during the 2018/19 financial year (including additional projects), and all Final Research Reports relevant to deepwater fisheries published in the 2018/19 year are listed within Section 3.2 of this Report.

C	**Observer Coverage Delivery:** The Fisheries New Zealand Observer Programme is responsible for delivering on the observer coverage targets set out in the final 2018/19 coverage plan and ensuring that the required biological sampling targets are met **LEAD: Fisheries Monitoring (Observer Services)**
	Observer coverage plans for all fisheries are prepared annually as are biological sampling targets and other observer tasks. The Deepwater Fisheries Management team will continue to work closely with Observer Services to ensure the necessary targets are achieved.
	Core Actions for 2018/19: • Assist Observer Services to deliver the 2018/19 observer coverage plan by continuing to engage with industry to regularly provide quarterly fishing plans to Observer Services to

[31] The Research Standard can be accessed online; http://www.mpi.govt.nz/dmsdocument/3692-research-and-science-information-standard-for-new-zealand-fisheries

	facilitate placement of observers and delivery of the required representative levels of coverage; • Ensure Observer Services is aware of, and that observers are adequately briefed on, the biological sampling targets and any new requirements for 2018/19. • Provide training to new recruits as part of the intake process to ensure that observers collect data and sample correctly; • Request frequent reporting and updates of coverage levels against targets throughout the 2018/19 year; and • Engage with, and provide feedback to, observers through the observer newsletter and observer catch-up sessions.
	Action linked to all Management Objectives
	Actions achieved: • The delivery of the 2018/19 observer coverage plan and associated biological sampling and percentage-level coverage targets are detailed in Section 4.1 of this Report; • Quarterly fishing plans were requested from industry for the first, second and fourth quarters of the 2018/19 fishing year; • Fortnightly meetings were held between the Deepwater Fisheries Management team and Fisheries New Zealand Observer Services to discuss future observer coverage needs, the prioritisation of species for biological sampling and any other issues arising from deepwater observer coverage; • By participating in observer assessment centres, the Deepwater Fisheries Management team contributed towards the recruitment of new observers; • The Deepwater Fisheries Management team attended three intakes of observer trainees at the Nelson Marlborough Institute of Technology (NMIT). During such visits, the Deepwater Fisheries Management team gave presentations covering the QMS, Fisheries Management Science, non-regulatory measures used in deepwater fisheries management and the mitigation devices used to reduce interactions between fishing vessels and seabirds/marine mammals; and • The Deepwater Fisheries Management team attended an observer catch-up session and spoke with observers regarding the redesign of observer forms.

D	**Cost Recovery Process:** Assist the Business and Financial Advice team with the cost recovery processes for 2018/19 and 2019/20. **LEAD: MPI Corporate Services (Cost Recovery)**
	MPI undertakes an annual cost recovery process to recover costs associated with fisheries compliance, registry, research, and observer coverage. There are two stages to the process: the first involves undertaking a port price survey while the second consists of calculating the levies for each stock.
	Core Actions for 2018/19: • Ensure the Deepwater Fisheries Management team has input into the port price survey process administered by the Finance team. • Ensure the cost recovery levy process recovers costs consistent with deepwater observer coverage and research plans, including providing information to support the unders/overs process.
	Action linked to all Management Objectives

Actions achieved:

- Deepwater Fisheries Management contributed to the port price survey process, and provided information as required to enable accurate recovery of costs associated with observer and research delivery. Detailed information on the 2018/19 cost recovery levies may be found in Appendix V of this report.

E

Compliance risk profiling and monitoring work
LEAD: Compliance Directorate (Operations Branch)

MPI's Compliance Directorate will continue to focus on monitoring deepwater fishing activity and catch reporting in 2018/19 to ensure the fleet demonstrates behaviours and practices consistent with legislative and regulatory requirements. The emphasis for MPI's Compliance Directorate for 2018/19 is to:

- Monitor tier one fisheries with a focus on compliance with the Conversion Factor regime (i.e. processed state);
- Provide advice to industry to reduce potential non-compliance; and
- Targeted inspections and audit of risk activities.

Key Actions for 2018/19:

- Engage with industry to support compliance with the digital monitoring and positional reporting requirements;
- Monitor compliance issues identified in risk profiles;
- Provide compliance and enforcement information to support the reassessment process for MSC certified fisheries;
- Engage with industry to verify fish to meal sources and meal quantification processes identified in factory plans for vessels.

Core Actions for 2018/19:

- Assess compliance risk for deepwater fisheries;
- Investigate issues where offending is suspected;
- Carry out at-sea inspections; and
- Audit catch returns.

Action linked to all Management Objectives

Actions achieved:

- The Deepwater Compliance Group, which includes representatives from the Deepwater Fisheries Management team and Compliance, met in March 2019;
- One outcome from the meeting was to acknowledge that the compliance group, which contained a sub-set of vessel operators, has largely been replaced by broader compliance-focused engagement with deepwater vessel operators collectively; and
- The focus of work undertaken during 2018/19 by Compliance in relation to deepwater fisheries without specific involvement of the Deepwater Fisheries Management Team was on electronic reporting.

2.3 MANAGEMENT ACTIONS INITIATED BY INDUSTRY

Management Actions that the Deepwater Fisheries Management team contributed towards delivery of, but that were initiated by industry are summarised in Table 4 below.

Table 4: Summary of progress on industry-initiated Management Actions during the 2018/19 financial year.

When required, work with industry to :
• Respond to any industry requests for changes to QMA boundaries or definitions; • Respond to applications for vessel specific conversion factors; • Support development of new fisheries within sustainable limit; • Respond to any requests for special permits for deepwater species; and • Respond to any requests to use innovative trawl gear.
Actions achieved: • No applications for vessel specific conversion factor certificates were received; • All vessel specific conversion factor testing was undertaken on a pro rata basis i.e. vessel operators were charged for the proportion of each trip that was dedicated to testing (4 days during the 2018/19 financial year were delivered on board one vessel); • A request to transfer fish between vessels under the transhipping provisions of the Act (Section 110) was received and actioned in June 2019. The request related to <28 m trawlers operating in the Cook Strait and West Coast South Island hoki fisheries; • A vessel-specific exemption to the Fisheries (Seabird Mitigation Measures – Bottom Longlines) Circular 2018 was approved which permitted the FV '*Tasman Viking*' to discharge offal and fish during hauling on the same side of the vessel to which the hauling station is located (under additional mitigation and monitoring conditions) when fishing with bottom longline; and[32] • Four special permits pertinent to deepwater fisheries were issued.

2.4 IMPLEMENTATION OF THE NATIONAL PLAN OF ACTION – SEABIRDS (2013)

The NPOA-Seabirds (2013) sets out objectives to guide management of interactions with seabirds in New Zealand fisheries. The objectives are implemented through integration into Fisheries New Zealand's annual planning cycle. This ARR reports back on the prioritised actions and services needed to meet these objectives for deepwater fisheries as set out in the 2018/19 AOP. The five year review of the NPOA-Seabirds (2013) began in 2017. During the 2018/19 financial year, drafts of the NPOA-Seabirds 2020 and a review of the NPOA-Seabirds (2013) was provided to the Seabird Advisory Group for comment.

The NPOA-Seabirds (2013) objectives address four key areas:

i) a practical objective focused on continuous improvement to reduce and where practicable, eliminate the incidental mortality of seabirds;

ii) a biological risk objective focused on ensuring seabird populations remain at or attain a favourable conservation status;

iii) a research and development objective focused on researching mitigation and observation methods, and seabird biology, demography and ecology; and

iv) an international objective focused on the implementation of best practice mitigation in other fishing fleets that overlap with New Zealand breeding seabirds.

[32] Details of the vessel-specific exemption can be accessed at https://gazette.govt.nz/notice/id/2019-go1634

The NPOA-Seabirds (2013) employs a quantitative risk assessment framework that generates quantitative risk scores for seabird species. It allows for identification of the seabird species most at risk from commercial fishing, as well as the fisheries that contribute the greatest risk to these species and seabirds more generally. This information is used to prioritise management action to reduce the overall risk that commercial fishing poses to seabirds over time.

The risk assessment calculates a risk score, which is defined as the ratio of fishery-related deaths (an estimate of the number of birds killed in fisheries each year)[33] to a population sustainability threshold (PST), which is the number of human-induced mortalities a population can sustain while maintaining a defined population outcome (the current seabird risk assessment uses a population outcome of stabilising after 20 years and reaching 50% of carrying capacity (*K*) after 100 years).

A seabird species is considered to be at 'very high' risk from fishing if the mean ratio of fishery-related deaths to the mean PST is higher than 1 or has an upper 95% credible limit above 2. A species is considered to be at 'high risk' from fishing if the mean ratio of fishery-related deaths to the PST is above 0.3 or the upper 95% credible limit is above 1. As the risk assessment is an ongoing process of iterative improvement, and is updated as the methodology improves and when new data and parameter estimates becomes available, risk scores can change over time. Therefore, the most recent risk assessment (published in 2020), based on seabird bycatch and fisheries data to the end of the 2016/17 fishing year, differs from those published previously.[34] The 2020 seabird risk assessment identified one seabird species as being at a 'very high' risk from fishing and five seabird species as being at a 'high' risk from fishing.

Those seabird species considered to be at a 'very high' or 'high' risk from fishing for which deepwater fisheries contribute more than 10% of the risk (according to the most recent iteration of the seabird risk assessment) are listed below. Of these species, fully quantitative population modelling has been completed for southern Buller's albatross[35], Chatham Island albatross and white-capped albatross. The outcomes of these assessments or species-specific population modelling (completed since the Seabird Risk Assessment was published) will be reviewed and considered as part of any management updates.

2.4.1 HIGH RISK SEABIRDS

Salvin's albatross

Deepwater fisheries contribute a total of 59% of the risk score for Salvin's albatross with most of the contribution from hoki, scampi and middle-depth trawl,[36] and small vessel ling bottom longline fisheries. Deepwater fisheries account for 1,322 of the total 2,250 fishery-related deaths with the PST for Salvin's albatross estimated to be 3,460. The main uncertainty in the modelled risk is the number of captures in inshore trawl fisheries, the cryptic mortality multiplier, and the estimate of adult survival.

Westland petrel

Deepwater fisheries contribute a total of 27% of the risk score for Westland petrel with most of the deepwater contribution from the hoki trawl and small vessel (<28 m) ling bottom longline fisheries. Deepwater fisheries account for 52 of the total 194 fishery-related deaths with the PST of Westland petrel estimated to be 351.

Southern Buller's albatross

Deepwater fisheries contribute a total of 69% of the risk score for southern Buller's albatross with most of the contribution from hoki, squid and middle-depth trawl fisheries. Deepwater fisheries account for 333 of the total 486 fishery-related deaths with the PST for southern Buller's albatross estimated to be 1,360.

[33] Previously referred to as the number of annual potential fatalities (APFs)

[34] https://www.mpi.govt.nz/dmsdocument/39407/direct

[35] https://www.mpi.govt.nz/dmsdocument/11662-aebr-165-2014-demographic-assessment-of-the-snares-islands-population-of-southern-bullers-albatross-diomedea-bulleri-bulleri

[36] Principally silver warehou and barracouta target trawl fisheries.

2.4.2 CAPTURE RATE REDUCTION TARGETS

Capture rate reduction targets provide a gauge against which the Practical Objective of the NPOA-Seabirds (2013) can be measured. A working group of the Seabird Advisory Group (SAG), was tasked with developing a set of principles that could be used when determining capture rate reduction targets. The group recommended that fisheries be defined using the same groupings as that of the risk assessment model, and that targets should be quantitative wherever possible. These targets would then be compared to a baseline capture rate, which has been defined as the average estimated capture rate across the three year block leading up to the implementation of the NPOA-Seabirds (2013) with at least 10% observer coverage and a coefficient of variation (CV) of less than 0.30. It was also agreed that these targets should be meaningful, and a test was devised based on the level of actual observed captures, the estimated captures, and the corresponding capture rate.

Table 5 sets out the deepwater capture rate reduction targets and proxy targets along with three year averages (based on the 2015/16 to 2017/18 fishing years[37]) of observer coverage and estimated capture rates for deepwater fisheries groupings.[38] Table 5 also shows progress against capture rate reduction and proxy targets, however the statistical analysis required to determine whether changes in estimated seabird capture rates are significant has yet to be completed.

[37] Data from the 2015/16 to 2017/18 fishing years are used as estimated capture data for the 2018-19 fishing year is not currently available.

[38] All data in Table 5 is taken from; https://psc.dragonfly.co.nz/2017v1/released/summary/

Table 5: Deepwater capture rate reduction targets and three year averages of observer coverage and estimated capture rate.

Fishery	Targets				Three year average (15/16-17/18)		Progress against target/proxy
	Suggested target/proxy	Baseline capture rate (per 100 tows/1000 hooks)	'Target' rate/100 tows (reduction)	Meaningful target?	Observer coverage (%)	Estimated capture rate (per 100 tows/1000 hooks)	
SBW trawl	Continue to monitor and report, target is no significant increase (based on 3-yr rolling averages)	1.1	-	No	100%	1.25	-
SQU trawl (> 28 m)	Statistically significant decrease in rate (based on 3-yr rolling average)	14.0	12.0 (14%)	Yes	87%	11.99	15/16 – 17/18 estimated capture rate met target
JMA trawl (> 28 m)	Continue to monitor and report, target is no significant increase (based on 3-yr rolling averages)	1.0	-	No	84%	0.52	-
SCI trawl	Observer coverage has been >10% twice in the most recent 4 years with 8.4% of tows observed in the last five years. This is not considered sufficient to provide a robust baseline. Proxy target is to have VMPs in place on all vessels, ELO to visit all scampi vessels, and a target of 15% observer coverage be set.	-	-	No	8%	2.87	VMPs in place for all scampi vessels. During 2018/19, the DWG ELO visited 10 of the 11 scampi vessels. Observer coverage of 16% of effort in 2018/19.
Deepwater trawl[39]	Continue to monitor and report, target is no significant increase (based on 3-yr rolling averages)	0.6	-	No	30%	0.36	-
Middle-depth trawl (>28 m)[40]	Statistically significant decrease in rate (based on 3-yr rolling averages)	2.7	2.3 (15%)	Yes	37%	2.38	15/16 – 17/18 estimated capture rate slightly above target rate
Large vessel BLL (>28 m)	Continue to monitor and report, target is no significant increase (based on 3-yr rolling averages)	0.01	-	No	20%	0.02	-
Small vessel LIN BLL (<28 m)	Work with industry to implement vessel-specific seabird management plans including the use of best practice mitigation across this fleet. Liaison officers will also provide seabird training sessions to crew. Observer coverage target of 15% of effort to be set.	-	-	No	4%	0.05	During 2018/19, the DWG ELO visited 26 of the 29 manual bottom longliners which landed >2 t of LIN during 2018/19. Observer overage of 9% of effort in 2018/19.[41]

[39] Deepwater trawl includes orange roughy and oreo species.

[40] Middle-depth trawl includes trawl effort for all species other than those with specific categories. This includes hoki, hake, ling and a number of Tier 2 species.

[41] All LIN QMAs.

2.4.3 DEEPWATER MANAGEMENT APPROACH - SEABIRDS

In Deepwater fisheries, seabird interactions are avoided or mitigated by:

- mandatory use of seabird scaring devices and implementation of seabird mitigation measures;[42]
- implementation of best practice seabird mitigation measures through VMPs and Operational Procedures;
- an annual crew training and vessel outreach programme;
- ongoing exploration of new or improved mitigation methods, and
- Fisheries New Zealand observers monitoring at-sea vessel adherence to VMPs.

VMPs outline a set of operational procedures that are specific to each vessel. These include fish waste management systems, the correct deployment of seabird scaring devices and the removal of 'stickers' (fish caught in mesh) between each tow. Contingency plans for equipment failures (that may increase seabird capture risk, and additional reporting requirements for capture events are also included.

Throughout 2018/19, actions in deepwater fisheries to support the NPOA-Seabirds (2013) were focused on continuing to improve and manage the VMP process, and seabird training sessions for crew on bottom longline vessels. Table 6 sets out the objectives and specific services that were planned for Deepwater Fisheries Management, and the actions achieved during 2018/19. Many of the services contributed to the achievement of more than one objective. These measures contribute to a reduction over time in the number and rate of seabird captures resulting from fishing activity, and contribute to achieving the practical and biological objectives of the NPOA-Seabirds (2013).

Table 6: NPOA-Seabirds (2013) services planned for Deepwater Fisheries Management during the 2018/19 fishing year.

Five-year Objectives	
Practical objectives	**Biological objectives**
a) All New Zealand commercial fishing vessels are shown to be implementing current best practice mitigation measures relevant to their area and fishery; **b)** Recreational and customary non-commercial fishers understand the risks their fishing activities pose to seabirds, relevant organisations support and promote the use of best practice mitigation measures and it is the cultural norm in New Zealand to use such measures; and **c)** Capture rates are reducing in all New Zealand fisheries in accordance with reduction targets in the relevant planning documents for those fisheries (three year rolling average).	• The level of mortality of seabirds in New Zealand commercial fisheries is reduced so that species currently categorised as 'very high' or 'high risk' from fishing, move to a lower category of risk.

[42] Regulations require trawlers over 28 m in overall length to deploy a seabird scaring device during all tows (https://www.mpi.govt.nz/dmsdocument/20321/loggedIn) and all bottom longliners to deploy streamer (tori) lines, restrict offal and fish discharge and either set at night or use an approved line weighting regime (http://www.legislation.govt.nz/regulation/public/2018/0116/latest/whole.html).

Planned deepwater services for 2018/19:

- Work with the DWG ELO to continually improve the VMP process and apply it across the wider deepwater fleet, and improve awareness of times and areas where the risk of seabird interactions is increased;
- Continue to monitor at-sea adherence to VMPs, as well as review VMPs and education programmes to ensure all measures are as effective as possible. The goal is:
    I. 100% of observed trips have audited the VMP;
    II. 95% of observers debriefed by the Deepwater Fisheries Management team; and
    III. Follow up all non-adherence.
- Work across Fisheries New Zealand, and with key stakeholders, to monitor the targets already developed and report on appropriate seabird performance measures including capture rate reduction targets;
- Increase observer coverage to further monitor seabird interactions in the ling bottom longline and scampi trawl fisheries to reduce uncertainty in the risk assessment; and
- Implement actions from the Black petrel and Flesh-footed shearwater Action Plan in the scampi fishery including:
    I. Ongoing auditing and monitoring of at-sea adherence to VMPs; and
    II. Monitoring of effectiveness of current mitigation measures detailed in VMPs.

Actions Achieved 2018/19:

- Of the 200 observed deepwater trips during the 2018/19 fishing year,[43] the Deepwater Fisheries Management team either debriefed the observers, or reviewed the relevant material,[44] after 192 trips (96%);
- Observers on 97% of trips on >28 m trawl, scampi trawl or ling bottom longline vessels audited vessel adherence to the VMP or Ling Bottom Longline Operational Procedures. Summaries of vessel adherence to VMPs/Operational Procedures were provided to the DWG ELO after 184 such trips with follow up (corrective) actions initiated after 20 trips;
- Observers audited the VMPs of all trawl vessels >28 m that regularly target deepwater species (32 vessels) and 10 of the 11 trawl vessels used to target scampi during the 2018/19 fishing year;
- During the 2018/19 fishing year, observers audited vessel adherence the Ling Bottom Longline Operational Procedures of two longline vessels >34 m in length and eight longline vessels <34 m in length. Collectively, those vessels audited against the Ling Bottom Longline Operational Procedures were responsible for 45% of longline effort (hooks) used to target ling in LIN 2 – LIN 7;
- Observers audited vessel adherence to the Hoki Coastal Trawl Operational Procedures of nine vessels <28 m in length used to target hoki in the Cook Strait or West Coast South Island 'inside the line' fisheries (60% of <28 m vessels used to target hoki in these areas);
- During 2018/19 the DWG ELO visited 91 vessels including 28 factory trawlers (including all ten foreign owned vessels), five large fresh trawlers (>28 m), 14 hoki-season fresh trawlers (<28 m), ten scampi trawl vessels, all eight ling auto bottom longliners and 26 of the 29 manual baiting bottom longliners that landed >2 t of LIN during the 2018/19. During vessel visits, the

[43] Includes all trips on trawl vessels >28 m in length during which deepwater species were targeted, all trips on trawl vessels <28 m during which Tier 1 species were targeted and all trips on bottom longline vessels during which ling was targeted.

[44] Due to operational constraints (e.g. observers returning to the office following the trip or observers departing on another vessel shortly after the cessation of the previous trip) it was not possible for the Deepwater Fisheries Management team to debrief observers in person after all trips. However, 100% of observers were debriefed by Observer Services at the end of the trip with all relevant material made available to the Deepwater Fisheries Management team.

DWG ELO trains/refreshes vessel managers and senior crew to promote best practice mitigation standard practices across the fleet, as codified in VMPs and Operational Procedures;

- The Deepwater Fisheries Management team reported on appropriate seabird performance measures, including capture rate reduction targets within Table 5 of this Report.
- Observer coverage during the 2018/19 fishing year was increased in the scampi (486 seadays[45] of observer coverage compared to 318 in 2017/18) but decreased in the ling bottom longline fisheries (298 seadays of coverage compared to 362 in 2017/18). This is less than the number of days planned due to high levels of observer coverage required elsewhere (e.g. 100% observer coverage on FOVs); and
- All vessels used to target scampi in FMA 1 have a VMP in place in accordance with actions specified in the Black petrel and Flesh-footed shearwater Action Plan. Approximately 15% of scampi effort in FMA 1 was observed (one trip) during the 2018/19 fishing year. Observers audited at-sea adherence to the VMP of vessels responsible for 96% of scampi effort in FMA 1 during 2018/19.

Research and development objectives

a) Where existing mitigation measures are impractical or of limited effectiveness in reducing the mortality of seabirds, new or improved mitigation measures have been sought and where identified are under development for all priority fisheries or fishing methods;

b) New observation and monitoring methods, especially in relation to poorly observed fisheries, are researched, developed and implemented; and

c) Programmes of research to improve understanding of, and ability to mitigate, seabird incidental mortality for at risk species are underway and key projects for very high risk species have been completed.

Planned deepwater services for 2018/19

- Investigate and implement any additional practicable and effective measures to minimise the risk of seabird net captures based on outcomes of contracted project characterising net captures and potential contributing factors;
- Continue to engage in DOC and Fisheries New Zealand research planning and review processes; and
- Continue to engage in the SAG.

Actions Achieved 2018/19:

- The Deepwater Fisheries Management team participated in a Southern Seabirds Solutions[46] facilitated net capture workshop held in Nelson. The purpose of the workshop was to brainstorm ideas on how seabird net captures on deepwater trawl vessels may be reduced and was also attended by representatives of DOC and the commercial fishing industry (including skippers). Following the workshop, the Deepwater Fisheries Management team contributed to further developing ideas and identifying those potential solutions worth progressing;
- The project assessing the risk factors that influence the rate of seabird net captures on deepwater trawl vessels was contracted during the 2018/19 financial year. As such outputs are not yet available to inform potential mitigation measures; and
- The Deepwater Fisheries Management team continued to engage in DOC and Fisheries New Zealand research planning and review processes and participated in five SAG meetings.

[45] An observer seaday is defined as one day on which an observer is placed on a vessel which has left port for the purposes of fishing.

[46] https://www.catchfishnotbirds.nz/

3. Part 3B: Deepwater Fisheries Research, Compliance, Observer Coverage and Cost Recovery Levies

This Section of the ARR provides detail on Fisheries New Zealand fisheries and conservation services that are relevant to Deepwater Fisheries Management and are planned by financial year (1 July – 30 June). These processes include the planning and contracting of fisheries and conservation research projects, planning observer coverage on the deepwater fleet and the cost recovery regime.

Please note that all fishing effort, and observer coverage data for 2018/19 is ungroomed and may be subject to change.

3.1 OBSERVER COVERAGE

Biological sampling and environmental monitoring is informed by the requirements of the National Deepwater Plan and carried out by the Fisheries New Zealand Observer Services. Data collected by Observer Services is used by Fisheries New Zealand:

- As an input to monitor key fisheries against harvest strategies;
- As an input to monitor biomass trends for bycatch species;
- To enable analysis of the nature and extent of interactions with protected species;
- To assess compliance with both regulatory and non-regulatory measures; and
- To enable real-time responses to sustainability and environmental impact issues.

Observer coverage is planned by both Fisheries New Zealand and DOC, based on the management objectives of both agencies. Observer coverage is used by DOC to collect information regarding fisheries interactions with protected species.

3.1.1 2018/19 OBSERVER COVERAGE PERFORMANCE

In 2018/19, observer coverage for each fishery was planned based on a combination of biological sampling targets, desired percentage coverage targets and expected deployment requirements necessary to comply with the Cabinet directive requiring all FOVs to have at least one observer on each trip. Planning required assumptions to be made regarding the number of vessels (particularly FOVs) that would operate in each fishery and the number of biological samples an observer takes per 'observer day' in each fishery. Details on the planning process and calculations can be found in the 2018/19 AOP.

In 2018/19, delivery on the observer coverage plan was affected by a number of factors including:

- Implementation of a number of Ministerial directives requiring high levels of observer coverage in a number of inshore fisheries (e.g. West Coast North Island). These competing priorities have resulted in ongoing reprioritisation of observer deployments, which has led to challenges in achieving coverage targets in some domestic deepwater fisheries (e.g. ling bottom longline);
- In some fisheries, most notably the ORH 7A & Westpac Bank fishery, observer coverage was achieved through required coverage on vessels planning to fish outside of New Zealand's EEZ. These days are not included in the deepwater planned (and cost recovered) coverage or delivery; and
- Some operational challenges remain with predicting fishing activities and vessel movements. Improvements have been made, with deepwater fishing companies providing quarterly fishing plans, however fishing activities can be difficult to predict.

The observer days delivered in relation to the days planned for each fishery complex for the 2018/19 financial year is summarised in Table 7. Table 8 shows the level of observer coverage within each

fishery complex for the 2018/19 fishing year, in addition to the percent observer coverage obtained for specific target fisheries within each complex.

Tables 9 and 10 provide information on the numbers of length frequency and otolith samples collected by observers for deepwater species during the 2017/18 and 2018/19 fishing years. Table 9 also provides information on how the level of observer sampling conducted during the 2017/18 and 2018/19 fishing years compared to sampling targets as defined in the 2017/18 and 2018/19 AOPs. This report provides the opportunity for review of performance against those targets.

Table 7: Comparison of planned and achieved observer coverage for the 2018/19 financial year.

Fishery complex	Target stocks	Planned FOV days	FOV days delivered	Planned domestic days	Domestic days delivered	Total days planned	Total days delivered	Percent delivered
Deepwater trawl								
North Island deepwater	ORH 1, ORH 2A, ORH 2B, ORH 3A, BYX 2 & CDL 2	0	0	100	65	100	**65**	65%
Chatham Rise deepwater	ORH 3B, OEO 3A, OEO 4 & BYX 3	0	0	220	260	220	**260**	118%
Sub-Antarctic deepwater	ORH 3B, OEO 1 & OEO 6	0	0	60	61	60	**61**	102%
West Coast deepwater	ORH 7A	0	0	60	19	60	**19**	32%
Hoki and middle-depth fisheries								
West Coast North Island	JMA 7, EMA 7 & BAR 7	600	790	50	16	650	**806**	124%
West Coast South Island (FMA 7)	HOK 1, HAK 7, LIN 7 & SWA 1	800	719	200	147	1,000	**866**	87%
WCSI HOK 'inside the line'	HOK 1	0	0	80	76	80	**76**	95%
Cook Strait HOK	HOK 1	0	0	120	116	120	**116**	97%
Chatham Rise middle-depth (FMA 3/FMA 4)	HOK 1, HAK 1, HAK 4, LIN 3, LIN 4, SWA 3, SWA 4, JMA 3, BAR 1 & BAR 4	550	306	300	436	850	**742**	87%
Sub-Antarctic middle-depth exc. SQU/SBW (FMA5/FMA6)	HOK1, SWA 4, WWA 5B, BAR 5 & JMA 3	600	401	200	149	800	**550**	69%
Southern blue whiting	SBW (all)	300	217	130	140	430	**357**	83%[47]
Squid	SQU 1T & SQU 6T	1,000	1,691	300	772	1,300	**2,463**	189%
Deepwater bottom longline								
Bottom longline	LIN 3 – LIN 7	0	0	400	357	400	**357**	89%
Scampi trawl								
Scampi	Scampi (all)	0	0	400	423	400	**423**	106%
Total		**3,850**	**4,124**	**2,620**	**3,037**	**6,470**	**7,161**	

[47] 100% of fishing effort targeting SBW was observed during the 2018/19 financial year. The shortfall in days delivered is due to fishing effort during 2018/19 being less than anticipated.

Table 8: Percent observer coverage obtained within deepwater fisheries during the 2018/19 fishing year. Rows highlighted in grey are not cumulative with the rows above and are provided to show percentage coverage for specific target fisheries within each complex.

Fishery complex	Target stocks		Commercial tows	Observed tows	Percent observed
Deepwater trawl					
North Island deepwater	ORH 1, ORH 2A, ORH 2B, ORH 3A, BYX 2 & CDL 2		1,315	169	13%
	Orange roughy target		795	163	21%
Chatham Rise deepwater	ORH 3B, OEO 3A, OEO 4 & BYX 3		2,271	734	32%
	Orange roughy target		1,467	414	28%
Sub-Antarctic deepwater	ORH 3B, OEO 1 & OEO 6		403	253	63%
	Orange roughy target		135	84	62%
West Coast deepwater	ORH 7A		435	53	12%
Hoki and middle-depth trawl[48]					
West Coast North Island	JMA 7, EMA 7 & BAR 7		1,507	1,191	79%
West Coast South Island (FMA 7)	HOK 1, HAK 7, LIN 7 & SWA 1		2,150	1,281	60%
WCSI HOK 'inside the line'	HOK 1		2,004	446	22%
Cook Strait HOK[49]	HOK 1		1,562	247	16%
Chatham Rise middle-depth (FMA 3/FMA 4)	HOK 1, HAK 1, HAK 4, LIN 3, LIN 4, SWA 3, SWA 4, JMA 3, BAR 1 & BAR 4		5,327	1,555	29%
	Hoki target		4,634	1,146	25%
Sub-Antarctic middle-depth excl. SQU/SBW (FMA 5/FMA 6)	HOK 1, SWA 4, WWA 5B, LIN 5, LIN 6, HAK 1, BAR 5 & JMA 3		2,275	1,202	53%
	Hoki target		995	382	38%
Southern blue whiting	SBW (all)		747	747	100%
Squid	SQU 1T & SQU 6T		4,278	3,705	87%
	SQU 6T target		810	770	95%
Deepwater bottom longline					
Bottom longline[50]	LIN 3 – LIN 7	<34 m	4,058,582	310,102	8%
		>34 m	16,778,099	2,065,220	12%
Scampi trawl					
Scampi	Scampi (all)		4,372	679	16%
	SCI 6A only		1,636	347	21%

[48] Excludes effort by trawl vessels less than 28 metres in length except for the WCSI 'inside the line' and Cook Strait hoki fisheries.

[49] Defined as statistical areas 016 and 017.

[50] Total and observed deepwater bottom longline effort is expressed in number of hooks set rather than number of tows.

Table 9: Numbers of length frequency samples and otoliths collected by observers during the 201718 and 2018/19 fishing years for Tier 1 deepwater species by area. Ticks or crosses indicate whether sampling targets (as set out in the 2017/18 and 2018/19 AOPs) were met.

Species		Area/method		Number of length frequency samples				Number of fish measured		Number of otoliths collected			
				2017/18		2018/19		2017/18	2018/19	2017/18		2018/19	
Jack mackerel	*Trachurus declivis*	JMD 3		147	✓	**61**	-	5,743	**1,770**	717	×	**302**	-
		JMD 7		427	✓	**388**	✓	30,367	**32,113**	2,461	✓	**2,311**	✓
	Trachurus murphyi	JMM 3		144	✓	**105**	-	4,901	**3,415**	624	×	**531**	-
		JMM 7		190	✓	**164**	×	2,620	**2,031**	525	×	**596**	×
	Trachurus novaezelandiae	JMN 3		33	✓	**-**	-	381	**-**	69	-	**-**	-
		JMN 7		271	✓	**244**	✓	26,469	**18,661**	1,238	✓	**970**	✓
Ling		LIN 3 & 4	BLL	306	✓	**77**	✓	3,829	**867**	921	✓	**458**	✓
			Trawl	155	✓	**155**		3,209	**2,919**	2,361	✓	**770**	
		LIN 5 & 6	BLL	85	×	**20**	✓	1,680	**210**	676	×	**100**	✓
			Trawl	444	✓	**288**		18,245	**12,634**	2,285	✓	**1,471**	
		LIN 7		269	✓	**202**	✓	5,275	**4,507**	1,372	✓	**1,301**	✓
		LIN Cook Strait		69	✓	**30**	-	712	**443**	326	×	**100**	-
Hake		HAK 1		99	×	**43**	×	3,540	**1,379**	470	×	**197**	×
		HAK 4		21	×	**11**	×	312	**151**	95	×	**59**	×
		HAK 7		405	✓	**157**	×	9,192	**3,209**	1,948	✓	**801**	×
Hoki		Sub-Antarctic[51]		711	✓	**330**	×	52,859	**18,935**	6,293	✓	**2,504**	✓
		Chatham Rise		390	×	**419**	✓	37,274	**38,822**	3,811	✓	**4,014**	✓
		WCSI	>46 m	893	✓	**522**	✓	87,967	**52,515**	8,439	✓	**5,060**	✓
			<46 m			**99**	×		**8,767**			**1,000**	✓
		Cook Strait		86	×	**99**	×	7,887	**10,546**	829	×	**991**	×
		ECNI		4	-	**20**	-	121	**1,556**	-	-	**-**	-
Orange roughy		ORH 1		A = 5 B = 13 C = 1 D = 19 Total = 34	× × × ×	**A = -** **B = 12** **C = -** **D = 1** **Total = 13**	× × × ×	A = 343 B = 480 C = 2 D = 587 Total = 1,412	**A = -** **B = 553** **C = -** **D = 11** **Total = 564**	A = 64 B = 115 C = 2 D = 106 Total = 287	- - - -	**A = -** **B = 129** **C = -** **D = 5** **Total = 134**	- - - -
		ORH 2A (North)		1	×	**4**	-	20	**178**	-	-	**56**	-
		ORH 2A (South)		4	-	**9**	-	140	**275**	35	-	**74**	-
		ORH 3B (NW Chatham Rise)		35	×	**21**	×	1,253	**932**	302	✓	**274**	×

[51] Includes samples taken from statistical areas 26 and 27 within Fisheries Management Area (FMA) Southeast Coast (SEC).

Species		Area/method	Number of length frequency samples				Number of fish measured		Number of otoliths collected			
			2017/18		2018/19		2017/18	2018/19	2017/18		2018/19	
		ORH 3B (E&S Chatham Rise)	12	×	**78**	✓	921	**5,024**	225	×	**1,314**	✓
		ORH 3B (Sub-Ant & Puysegur)	16	×	**19**	×	860	**1,181**	218	-	**309**	✓
		ORH 7A & Westpac Bank	80	✓	**30**	×	3,867	**2,170**	996	✓	**310**	✓
Oreo	Black	BOE 1	5	-	**1**	-	340	**20**	41	-	**15**	-
		BOE 3A	17	×	**37**	✓	1,143	**2,268**	161	×	**288**	×
		BOE 4	3	×	**6**	-	120	**522**	15	-	**53**	-
		BOE 6	20	-	**19**	-	1,203	**1,596**	149	-	**178**	-
	Smooth	SSO 1	8	-	**46**	-	443	**3,140**	58	-	**338**	-
		SSO 3A	20	×	**41**	✓	1,531	**3,232**	193	-	**358**	-
		SSO 4	10	×	**52**	✓	736	**2,959**	80	×	**355**	✓
		SSO 6	41	×	**-**	-	3,421	**-**	350	-	**-**	-
	Spiky	SOR 3A	1	-	**1**	-	20	**20**	-	-	**5**	-
		SOR 4	-	-	**4**	-	-	**80**	-	-	**20**	-
Scampi		SCI 1	55	✓	**55**	✓	8,905	**2,927**	N/A			
		SCI 2	-	×	**4**	×	-	**200**				
		SCI 3	56	✓	**142**	✓	6,699	**16,473**				
		SCI 4A	93	✓	**21**	×	8,140	**2,683**				
		SCI 6A	108	✓	**274**	✓	14,138	**19,092**				
Southern blue whiting		SBW 1	4	-	**-**	-	63	**-**	28	-	**-**	-
		SBW 6I	200	✓	**263**	✓	28,914	**40,414**	3,036	✓	**3,941**	✓
		SBW 6B	12	×	**8**	×	1,536	**1,384**	187	×	**216**	×
		SBW 6R	30[52]	×	**58**	-	851	**7,717**	161	-	**995**	-
		SBW 6A			**13**	-		**251**			**64**	-
Squid (all species combined)		SQU 1T	678	✓	**1,252**	-	71,285	**129,373**	N/A			
		SQU 6T	521	✓	**421**	-	54,693	**44,350**				

[52] All SBW 6A and 6R length frequency samples from 2017/18 were taken from tows targeting species other than southern blue whiting.

Table 10: Numbers of length frequency samples and otoliths collected by observers during the 2017/18 and 2018/19 fishing years for Tier 2 deepwater stocks

Species	QMA	Number of length frequency samples		Number of fish measured		Pairs of otoliths collected	
		2017/18	2018/19	2017/18	2018/19	2017/18	2018/19
Barracouta	BAR 4	42	**44**	3,064	**2,815**	222	**358**
	BAR 5	342	**356**	16,419	**13,848**	1,972	**1,943**
	BAR 7	308	**236**	11,763	**8,017**	1,554	**1,217**
Alfonsino	BYX 1	-	**1**	-	**20**	-	**5**
	BYX 2	10	**2**	655	**35**	79	**10**
	BYX 3	37	**21**	1,012	**971**	182	**110**
	BYX 7	9	**1**	123	**20**	42	**5**
Cardinal fish	CDL 2	-	**1**	-	**20**	-	**5**
	CDL 3	1	**-**	80	**-**	5	**-**
	CDL 5	1	**1**	20	**100**	5	**5**
Blue (English) mackerel	EMA 3	1	**2**	20	**40**	4	**12**
	EMA 7	141	**145**	4,020	**4,185**	738	**727**
Frostfish	FRO 3 & 4	3	**2**	59	**30**	16	**10**
	FRO 5	5	**-**	72	**-**	24	**-**
	FRO 7 - 9	101	**227**	2,730	**5,372**	503	**1,119**
Giant spider crab	GSC 3	6	**1**	110	**20**	N/A	
	GSC 5	72	**44**	1,944	**1,043**		
	GSC 6A	238	**113**	5,450	**1,987**		
	GSC 6B	-	**2**	-	**41**		
Dark ghost shark	GSH 4	51	**12**	924	**309**	N/A	
	GSH 5	5	**7**	81	**290**		
	GSH 6	33	**5**	452	**100**		
Pale ghost shark	GSP 1	132	**16**	2,278	**311**	N/A	
	GSP 5	21	**1**	344	**12**		
	GSP 7	17	**1**	262	**9**		
Lookdown dory	LDO 1	11	**4**	128	**80**	-	**10**
	LDO 3	1	**2**	21	**40**	-	**-**
Prawn Killer	PRK 1	-	**14**	-	**278**	N/A	
Patagonian toothfish	PTO 1	10		87		65	**-**
Redbait	RBT 3	42	**43**	1,676	**2,084**	179	**212**
	RBT 7	16	**8**	248	**101**	71	**16**
Rubyfish	All	6	**5**	307	**170**	20	**20**
Ribaldo	RIB 3 & 4	43	**34**	604	**601**	139	**155**

Species	QMA	Number of length frequency samples		Number of fish measured		Pairs of otoliths collected	
		2017/18	2018/19	2017/18	2018/19	2017/18	2018/19
	RIB 5 & 6	28	**-**	318	**-**	112	**-**
	RIB 7	60	**2**	1,070	**40**	333	**8**
Gemfish	SKI 3	88	**126**	1,521	**2,634**	449	**604**
	SKI 7	52	**89**	743	**1,632**	201	**446**
Spiny dogfish	SPD 4	38	**2**	807	**40**	N/A	
	SPD 5	26	**13**	565	**334**		
Sea perch	SPE 3	21	**3**	291	**60**	21	**14**
	SPE 4	101	**35**	1,790	**604**	456	**174**
	SPE 5	4	**-**	63	**-**	16	**-**
	SPE 7	6	**3**	98	**45**	29	**10**
Silver warehou	SWA 1	23	**24**	321	**901**	91	**120**
	SWA 3	133	**217**	4,729	**6,176**	692	**1,083**
	SWA 4	363	**517**	10,916	**13,026**	1,883	**2,532**
White warehou	WWA 3 & 4	18	**9**	429	**156**	62	**51**
	WWA 5B	51	**35**	1,812	**1,792**	303	**186**
	WWA 7	5	**-**	95	**-**	20	**-**

3.2 DEEPWATER FISHERIES RESEARCH

Research needs for deepwater fisheries are driven from the Objectives within the National Deepwater Plan and are primarily delivered through the research programme for deepwater fisheries. This research programme focuses on obtaining comprehensive, consistent and robust information in a cost-effective manner. To accomplish this, the research programme specifies the routine research and data collection necessary to meet Management Objectives.

Research projects contracted for the 2018/19 financial year, which are detailed in Table 11, included stock assessments, and trawl and acoustic surveys. All research projects are reviewed by Fisheries New Zealand Science Working Groups and are assessed against the Research and Science Information Standard for New Zealand Fisheries. This review process aims to ensure the quality of the research is sufficient to underpin Deepwater Fisheries Management. Delivery of quality research is driven through Management Objective 3 within the National Deepwater Plan which aims to ensure the effective management of deepwater and middle-depth fisheries through the availability of appropriate, accurate and robust information.

Table 12 details the status of the Aquatic Environment Research planned for the 2018/19 financial year and Table 13 details the status of biodiversity research relating to deepwater fisheries.

Progress reports are not available for all projects, reports are made publically available at the conclusion of each project. Projects listed as complete may not have published reports available at the time this ARR is published. Links to published research reports can be found in Table 14 of this Report.

Table 11: Deepwater research planned for the 2018/19 financial year and current status (as of February 2020). Table 11 also includes deepwater fisheries research projects from 2017/18 that were planned to be initiated in 2018/19.

Project code	Title	Status
DAE2018-01	Bycatch monitoring and quantification in deepwater fisheries	In progress
DAE2018-04	Taxonomic identification of benthic samples	In progress
HAK2018-01	Stock assessment of hake in HAK 7	Complete
HOK2018-01	Hoki population modelling and stock assessment	Complete
HOK2018-02	Land based catch sampling of hoki	Complete
LIN2018-01	Stock assessment of ling in LIN 3/4	Complete
MID2018-01	Estimation of hoki and middle depth fish abundance using trawl surveys (alternating Chatham Rise/Sub-Antarctic trawl surveys)	In progress
MID2018-02	Estimation of hoki and middle depth species fish abundance on the WCSI using trawl surveys	Complete
MID2018-03	Routine age determination of middle depth and deepwater species from commercial fisheries and resource surveys	In progress
OEO2018-02	Development of monitoring approach for smooth and black oreos in OEO 3A	Deferred
ORH2018-02	Stock assessment of orange roughy in ORH 7A	Complete

Project code	Title	Status
SBW2018-01	Estimation of southern blue whiting biomass using acoustic methods (Bounties Platform)[53]	Complete
SBW2018-02	Stock assessment of southern blue whiting in SBW 6B	N/A[54]
SCI2018-01	Stock assessment of scampi in SCI 1 and SCI 2	Complete
SCI2018-03	Estimating the abundance of scampi in SCI 6A using photographic surveys	Complete
SQU2017-01	Stock assessment development for squid (SQU 1T, SQU 6T)	Deferred
DEE2017-01	Stock assessment of blue mackerel (EMA 7)	Deferred
BAR2017-02	Update of abundance indices for BAR 4 and BAR 7	In progress
SCI2017-03	Management Strategy Evaluation for scampi	Deferred

Table 12: Aquatic Environment and Biodiversity research planned for the 2018/19 financial year and current status. Table 12 also includes ongoing Aquatic Environment and Biodiversity research projects relevant to deepwater fisheries.

Project code	Title	Status
BEN2018-01	Monitoring of trawl footprint (including coastal)	In progress
BEN2018-03	Automated image analysis for habitat classification and species distribution investigation	In progress
ENV2018-06	Improved distribution information for higher risk non-QMS shark species	In progress
PMM2018-04A	Estimate spatial distributions for at-risk marine mammals to assess fisheries overlap and risk: fur seals	In progress
PMM2018-04B	Estimate spatial distributions for at-risk marine mammals to assess potential fisheries overlap and risk: South Island NZ sea lions	In progress
PMM2018-08	Update SEFRA risk assessment tool – build observer coverage/digital monitoring optimisation function	In progress
PMM2018-09	Desktop estimation of pinniped cryptic mortality in trawls using SLEDs	Complete
PMM2018-11	Update Auckland Islands NZ sea lion population model	Complete
PSB2018-01A	Research into the demographic parameters for Antipodean albatross	In progress
PSB2018-10	Deepwater net capture analysis	In progress
ZBD2018-01	5 year continuous plankton survey	In progress
ZBD2018-02	Climate change, fish distribution meta-analysis	In progress
ZBD2018-03	Climate change and population parameters	In progress

[53] No acoustic snapshot to estimate abundance
[54] No acoustic snapshots to estimate abundance

Project code	Title	Status
ZBD2018-05	Ecosystem function and regime shifts in the sub-Antarctic	In progress
PMM2018-07	Updated spatially explicit fisheries risk assessment for New Zealand marine mammal populations	In progress

Table 13: Ongoing multi-year biodiversity research projects that relate to deepwater fisheries.

Project code	Title	Status
ZBD2017-02	Linking primary and secondary productivity	In progress
ZBD2017-04	Buffering eutrophication and prioritising climate change issues in coastal ecosystems	In progress
ZBD2016-07	Multiple stressors on coastal ecosystems-in situ	In progress
ZBD2016-11	Quantifying benthic biodiversity across natural gradients	In progress
ZBD2014-03	Sub-lethal effects of environment change on fish populations	In progress
ZBD2014-09	Climate change risks and opportunities	In progress
ZBD2013-02	Vulnerable Marine Ecosystems Project - Genetic Connectivity	In progress
ZBD2008-01	Research on biogenic habit-forming biota & their functional role in maintaining biodiversity in the marine environment	In progress

3.2.1 RESEARCH REPORTS

Final research reports from previously contracted work that were published in the 2018/19 financial year that relate to deepwater fisheries are shown in Table 14 below. Links to these documents are provided where possible, however all published reports can be found online (www.mpi.govt.nz/news-and-resources/publications/).

Table 14: Final research reports published during the 2018/19 financial year of relevance to deepwater fisheries.

Annual documents	
2019 May Plenary	Fisheries New Zealand (2019). Fisheries Assessment Plenary, May 2019: stock assessments and stock status. Volume 1 covers alfonsino to grouper. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
	Fisheries New Zealand (2019). Fisheries Assessment Plenary, May 2019: stock assessments and stock status. Volume 2 covers hake to pilchard. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
	Fisheries New Zealand (2019). Fisheries Assessment Plenary, May 2019: stock assessments and stock status. Volume 3 covers pipi to yellow-eyed mullet. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
2018 AEBAR	Ministry for Primary Industries (2019) Aquatic Environment and Biodiversity Annual Review 2018. Compiled by the Fisheries Science Team, Ministry for Primary Industries, Wellington, New Zealand. 704 p.
Aquatic Environment and Biodiversity Reports (AEBRs)	

213 PRO2013-13	Francis, M.P.; Hoyle, S.D. (2019). Estimation of fishing effort in the Southern Hemisphere.
210 DAE2017-04	Finucci, B.; Edwards, C.T.T; Anderson, O.F.; Ballara, S.L. (2019). Fish and invertebrate bycatch in New Zealand deepwater fisheries from 1990–91 until 2016–17.
203 ENV2015-03	McMillan, P.J.; Sutherland, J.; Anderson, O. (2018). Identification accuracy of six species of deepsea sharks sampled at sea by MPI observers, October 2016 to December 2017.
202 ZBD2008-01	Jones, E.G.; Morrison, M.A.; Davey, N.; Mills, S.; Pallentin, A.; George, S.; Kelly, M.; Tuck, I. (2018). Biogenic habitats on New Zealand's continental shelf. Part II: National field survey and analysis.
Fisheries Assessment Reports (FARs)	
2019-12 MID2017-01	Horn, P.L.; Sutton, C.P. (2019). Catch-at-age for hake (*Merluccius australis*) and ling (*Genypterus blacodes*) in the 2016–17 fishing year and from a research trawl survey in 2018, with a summary of all available data sets from the New Zealand EEZ.
2019-11 MID2017-01	Doonan, I.J.; Horn, P.L.; Ó Maolagáin, C.; Dutilloy, A. (2019). Age composition of spawning orange roughy, Mid-East Coast, North Island, New Zealand, 2017.
2019-10 DEE2016-20	Doonan, I.J.; McMillan, P.J.; Ó Maolagáin, C. (2019). Age composition of black oreo samples from OEO 3A, Chatham Rise: 2007–08 and 2008–09 commercial catch.
2019-04 DEE2016-20	Doonan, I.J.; Horn, P.L.; Ó Maolagáin, C.; Datta, S. (2019). Age compositions of orange roughy from the Puysegur Bank region (ORH 3B) in 1992 and 2015.
2019-01 BAR2017-01	Baird, S.J. (2019). Updated BAR 1 barracouta (*Thyrsites atun*) characterisation, with standardised CPUE for the east coast South Island fishery, 1990 to 2017.
2018-61 MID2017-01	Horn, P.L.; Ó Maolagáin, C. (2018). Commercial catch sampling for species proportion, sex, length, and age of jack mackerels in JMA 7 in the 2016–17 fishing year, with a summary of all available data sets.
2018-60 HAK2017-01	Ballara, S.L. (2018). Descriptive analysis of the fishery for hake (*Merluccius australis*) in HAK 1, 4 and 7 from 1989–90 to 2016–17, and a catch-per-unit-effort (CPUE) analysis for Sub-Antarctic hake.
2018-59 DEE2016-21	Dunn, M.R.; Doonan, I.J. (2018). Assessment of the Chatham Rise orange roughy stocks for 2017.
2018-58 DEE2016-06	Doonan, I.J.; Hart, A.C.; Ladroit, Y.; McMillan, P.J. (2018). Smooth oreo abundance estimates from the October-November 2016 acoustic survey of the south Chatham Rise (OEO 4).
2018-57 DEE2014-08	Doonan, I.J.; Roberts, J.; McMillan, P.J.; MacGibbon, D. (2018). Review of Challenger Plateau orange roughy abundance surveys 2005–13 and survey design options for future abundance estimates.
2018-56 TAN16-10	O'Driscoll, R.L.; Large, K.; Marriott, P. (2018). Acoustic estimates of southern blue whiting from the Campbell Island Rise, August–September 2016 (TAN1610).
2018-55 DEE2016-09	Ballara, S.L. (2018). Descriptive analysis of the fishery for hake (*Merluccius australis*) in HAK 1, 4 and 7 from 1989–90 to 2014–15, and a catch-per-unit-effort (CPUE) analysis for Chatham Rise and WCSI hake.
2018-52 DEE2016-21	Dunn, M.R. (2018). Orange roughy fisheries on Chatham Rise and Campbell Plateau (ORH 3B).
2018-50 DEE2016-20	Doonan, I.J.; McMillan, P.J.; Ó Maolagáin, C.; Datta, S. (2018). Age compositions of smooth oreo samples from OEO 4, Chatham Rise: 1991 trawl survey, 2008–09 commercial catch, and 2016 acoustic survey.
2018-49 DEE2016-20 SEA2017-01	Horn, P.L.; Ó Maolagáin, C. (2018). The length and age composition of the commercial trawl catch of blue mackerel (*Scomber australasicus*) in EMA 7 during the 2013–14 fishing year, with a summary of all available data sets.
2018-48 DEE2016-20	Doonan, I.J.; Horn, P.L.; Ó Maolagáin, C.; Datta, S. (2017). Age composition of orange roughy from ORH 3B, Chatham Rise, 2016: Mount Muck, Old Plume, Rekohu Plume, and Morgue.

2018-47 TAN16-09	O'Driscoll, R.L.; Ballara, S.L. (2018). Trawl survey of middle depth fish abundance on the west coast South Island, August 2016 (TAN1609).
2018-46 DEE2016-20	Horn, P.L.; Hulston, D.; Ó Maolagáin, C. (2018). Commercial catch sampling for species proportion, sex, length, and age of jack mackerels in JMA 7 in the 2015–16 fishing year, with a summary of all available data sets.
2018-45 MID2015-01	Horn, P.L.; McMillan, P.J.; Ó Maolagáin, C. (2018). Age estimation protocols for black oreo (*Allocyttus niger*) and smooth oreo (*Pseudocyttus maculatus*).
2018-44 MID2017-01	Horn, P.L.; McGregor, V. (2018). The age composition of the commercial trawl catch of silver warehou (*Seriolella punctata*) in SWA 3 and SWA 4.
2018-43 DEE2015-02	Marsh, C.; McKenzie, A.; Francis, R.I.C.C.; Doonan, I. (2018). Evaluating the effects of changes in the frequency of research abundance trawl surveys and age frequency sampling on the hoki, hake, and ling stock assessments.
2018-42 HOK2017-04	Dunn, M.R.; Langley, A. (2018). A review of the hoki stock assessment for 2018.
2018-41 TAN18-01	Stevens, D.W.; O'Driscoll, R.L.; Ballara, S.L.; Schimel, A.C.G. (2018). Trawl survey of hoki and middle depth species on the Chatham Rise, January 2018.
2018-40 DEE2016-08	McKenzie, A. (2018). Assessment of hoki (*Macruronus novaezelandiae*) in 2017.
2018-39 TAN16-14	O'Driscoll, R.L.; Ballara, S.L.; MacGibbon, D.J.; Schimel, A.C.G. (2018). Trawl survey of hoki and middle depth species in the Southland and Sub-Antarctic, November–December 2016.
2018-38 DEE2015-08	Dunn, A.; Hanchet, S.M. (2017). Southern blue whiting (*Micromesistius australis*) stock assessment for the Campbell Island Rise for 2016.
Conservation Services Programme (Department of Conservation) reports	
POP2018-03	Dodge, H. 2019. New Zealand Sea Lion Monitoring and Pup Production at The Auckland Islands 2018/19. Final report to the Conservation Services Programme. 32 p.
MIT2017-01	Rexer-Huber, K and Parker, GC. 2019. Characterising discharge management in small-vessel trawl and longline fisheries. Report to Conservation Services Programme. Parker Conservation, Dunedin. 43 p.
POP2017-01	Bell, M., Bell, D., Boyle, D. and Tuanui-Chisholm, H. 2018. Rangitatahi Seabird Research: December 2017. Technical report prepared for the Conservation Services Programme, Department of Conservation, 27 p.
POP2017-03	Baker, B. 2019. 2018 aerial survey of Salvin's albatross at the Bounty Islands. Final report to the Conservation Services Programme, Department of Conservation. Latitude 42, Australia. 11 p. Sagar, P., Charteris, M., Parker, G., Rexer-Huber, K. & Thompson, D. 2018. Salvin's albatross: Bounty Islands population project. Final report to the Conservation Services Programme, Department of Conservation, prepared by NIWA. 18 p.
POP2017-04	Rexer-Huber K., Elliott G., Thompson D., Walker K., Parker G.C. 2019. Seabird populations, demography and tracking: Gibson's albatross, white-capped albatross and white-chinned petrels in the Auckland Islands 2018–19. Final report to the Conservation Services Programme, Department of Conservation. Parker Conservation, Dunedin. 19 p. Rexer-Huber, K., Thompson, D.R., Parker, G.C. 2018. White-capped albatross mark-recapture study at Disappointment Island, Auckland Islands. Report to the Conservation Services Programme, Department of Conservation. Parker Conservation, Dunedin. 15 p.
POP2017-07	Marriott, P., Tracey, D., Bostock, H., Hitt, N., Fallon, S. (2019). The age and growth of New Zealand protected corals at high risk: *Bathypathes patula*. Final Report prepared by NIWA for the Conservation Services Programme, Department of Conservation. POP2017-07. NIWA Client Report 2019036WN. 23 p.

	Tracey, D., Bostock, H., Shaffer, M. (2018). Ageing methods for protected deep-sea corals: A review and recommendation for an ageing study. DOC Contract 4527 GMC - Age & Growth of coral (POP2017-07). NIWA Client Report No. 2018035WN 40 p.
INT2016-02	Bell, E.A. & Bell, M.D. 2018. INT2016-02 Identification of seabirds caught in New Zealand fisheries: 1 July 2017 to 30 June 2018. Annual Technical Report to the Conservation Services Programme, Department of Conservation. Wellington, New Zealand. 38 p.
INT2015-03	Macpherson, D., Tracey, D., Mills S., Thomas, H. (2018). Identification and storage of cold-water coral bycatch specimens: 1 July 20170 30 June 2018. Final Report prepared by NIWA for the Conservation Services Programme, Department of Conservation. INT2015-03. NIWA Client Report 201850WN. 49 p.
POP2015-02	Crowe, P. 2018. Foraging distribution and behaviour of flesh-footed shearwaters (Puffinus carneipes) breeding on Lady Alice Island – January 2018. Report prepared by Wildlife Management International Limited for the Conservation Services Programme, Department of Conservation, Wellington. 21 p.
	Crowe, P. 2018. Flesh-footed shearwater population monitoring on Ohinau and Lady Alice Islands, 2016/17 report – June 2018. Report prepared by Wildlife Management International Limited for the Conservation Services Programme, Department of Conservation, Wellington. 23 p.

3.3 COMPLIANCE

Successfully delivering on Management Objectives for deepwater fisheries is dependent upon high levels of compliance with the various sustainability and environmental regulations defined in legislation. MPI's Compliance Directorate is responsible for providing the intervention services to achieve cost-effective compliance with all regulations.[55]

Towards the end of the 2013 calendar year, MPI introduced 'interim observer trip reports.' These reports are sent to vessel operators within a few days of the completion of an observed trip. Fifteen questions are answered by the observer to provide more immediate feedback to vessel operators on a variety of factors. Of the 15 questions, observers answer 10 using a rating of 'A', 'B', 'C' or 'N/A'. It is considered that ratings of 'A' and 'B' are acceptable performance. The interim trip report template is shown in Appendix V.

Overall, 189 interim trip reports relating to observed trips on deepwater vessels[56] were completed in the 2018/19 financial year (Table 15). Observers answered 83% of questions with a rating of 'A', 5% of questions with a rating of 'B', 12% of questions with a rating of 'N/A' and less than 1% of questions with a rating of 'C'. Of the 189 interim trip reports completed during the 2018/19 financial year, only 8 trips had one (or more) of the questions receive a 'C' rating by observers.

[55] Function is now under the Compliance Directorate in the Operations Branch of MPI.

[56] Trawl vessels greater than 28 m targeting Tier 1 or Tier 2 species, trawl vessels less than 28 m targeting Tier 1 species and all bottom longline vessels targeting ling (regardless of size). Includes trips fishing outside New Zealand's EEZ.

Table 15: Summary of interim trip reports where a 'C' rating was given for the 2018/19 financial year.

Factor	Number of 'C' ratings
QMS species are discarded only after correct estimation and authorisation[57]	1
QMS species identified accurately	0
Vessel has a valid system for determining, recording and retaining block weight test information	0
Vessel has a valid system in place to quantify all sources of whole and processed fish to meal including applying conversion factor to processed fish[58]	0
Fish is cut in accordance with the Conversion Factors Notice	2
Non-fish by-catch recorded and reported accurately	0
Offal management was adequate (if VMP on board, meets specifications)[59]	4
Appropriate bird mitigation devices were deployed and in working condition for duration of trip	2
The factory was clean and hygienic	0
Observer Standard met (e.g. living conditions, water etc., were adequate)	1

3.4 COST RECOVERY LEVIES

Research, compliance activities, observers, and registry services are funded, at least partially, by levies recovered from the fishing industry.

The cost recovery regime, which is legislated under Part 14 of the Act, enables the Crown to recover its costs in respect of the provision of fisheries and conservation services, as far as practicable, from those people who have requested services, who benefit from the provision of those services or cause the adverse effects that the services are designed to avoid, remedy or mitigate.

MPI uses the Fisheries (Cost Recovery) Rules 2001 to calculate the levies to be applied to each fish stock, based on the total amount to be cost recovered from the commercial fishing industry and the under or over-recovery of levies in the previous year. The proposed levies are consulted on with industry as per statutory requirements. Table 16 shows the total amount levied from deepwater stocks for the 2018/19 financial year and Figure 3 shows the total amount levied for both deepwater, and all, stocks between the 2006/07 and 2018/19 financial years. Species specific cost recovery levies are provided in Appendix IV.

[57] Observers rate this as N/A if there were no QMS discards during the trip.

[58] Observers rate this as N/A if the vessel does not have a meal plant.

[59] Observers rate this as N/A if little or no offal was produced during a trip.

Table 16: The total levied for the 2018/19 financial year from stocks managed under the National Deepwater Plan as well as the total levied across all New Zealand fisheries.

		Total levied ($) for stocks managed in the National Deepwater Plan	Total levied ($) for all New Zealand fisheries
Compliance		5,980,929	13,279,625
Registry		1,614,239	3,584,125
Observers	MPI	2,430,560	3,212,451
	DOC	544,475	949,622
Research	MPI	6,506,190	11,795,174
	DOC	378,753	1,075,755
Under & Overs	MPI	-2,117,789	-5,496,655
	DOC	-14,537	45,094
Total		**15,323,099**	**28,445,191**

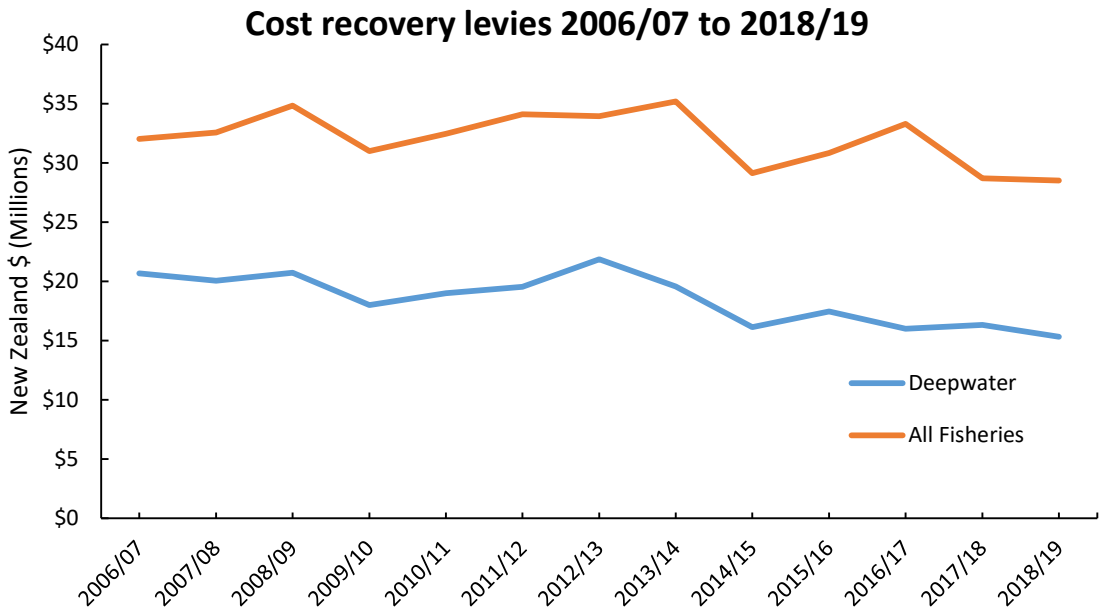

Figure 3: Total amount recovered by cost recovery levies between 2006/07 and 2018/19. Separate totals are shown for deepwater species and all species combined.[60]

[60] The decline in deepwater levies cost recovered from 2013/14 onwards is due to reprioritisation of research projects and shifting trawl surveys to alternate years.

4. Part 3C: General environmental reporting and adherence to non-regulatory management measures

This part of the ARR summarises the overall impacts of deepwater fishing on the marine environment, and reports adherence to non-regulatory environmental mitigation measures for the 2018/19 fishing year. Species-specific environmental interactions are reported in Appendix I. Please note that all 2018/19 data presented in this section is ungroomed and subject to change.

4.1 ENVIRONMENTAL REPORTING

New Zealand's deepwater fisheries are known to interact with the marine environment including protected species, the benthic habitat, and other bycatch species. In order to achieve Management Objectives 5, 6, 7 and 8, DWG and Fisheries New Zealand work together to monitor adherence to non-regulatory management measures and environmental interactions.

Non-regulatory measures include vessel-specific VMPs for mitigating incidental seabird captures Marine Mammals Operational Procedures (MMOP), and notification requirements for certain numbers of seabird or mammal captures (trigger points).

Vessel operators are required to report all captures of protected species to Fisheries New Zealand as part of their obligations under the Fisheries (Reporting) Regulations 2017. However, for reasons of increased reliability, analyses of protected species interactions and adherence to non-regulatory measures is based on information collected during observed fishing trips.

Observers from each observed trip on deepwater vessels are debriefed by the Deepwater Fisheries Management team to determine the vessel's adherence to all non-regulatory measures. Feedback on performance for every trip is provided to DWG. In any instance where issues were reported by observers, further follow up action is taken by DWG (discussed below). Regardless of whether follow up action is required or not, DWG provide feedback to operators after every observed trip.

Table 17 summarises the number of observed trips on trawl vessels >28 m in length (during which Tier 1 species were targeted) and scampi trawlers (regardless of length) completed between the 2014/15 and 2018/19 fishing years, and the results of the audit of vessel adherence.

Table 17: Summary of Fisheries New Zealand observer audits of adherence to non-regulatory measures.

Fishing year	Observed trawl trips	Reviews sent to and reviewed by DWG	Trips with no issues raised	Trips requiring follow up	Proportion of reviewed trips requiring follow up (%)
2014/15	162	160	132	28	18%
2015/16	162	160	140	20	13%
2016/17	151	149	128	21	14%
2017/18	156	150	134	16	11%
2018/19	179	174[61]	159	15	9%

[61] Those observed trips on trawlers >28 m in length for which reviews of adherence to non-regulatory measures were not provided to DWG were mostly those trips where inshore species only were targeted.

4.1.1 VESSEL MANAGEMENT PLANS

The following section summarises information provided through observer audits of >28 m trawl and scampi trawl vessel performance in relation to measures within VMPs. Measures within VMPs that vessels are audited against include the use of bird mitigation devices, the removal of fish 'stickers' from the net before shooting, avoiding shooting gear near congregations of marine mammals, and employing offal management techniques. Offal management is intended to reduce the amount of 'food' in the water for seabirds and marine mammals while fishing gear may pose a risk to those animals.

During 2018/19 VMP-related issues that required follow-up by DWG were identified following 15 trips on >28 m or scampi trawl vessels. VMP issues were classed as being in one of four general categories (Table 18). Offal management issues were followed up after eleven trips.

I. **Administrative** – Relating to misunderstandings about requirements i.e. the need for observers to be shown live seabirds prior to release;

II. **Seabird trigger reporting** – relating to the reporting of trigger points;

III. **Seabird mitigation** – relating to the need to employ an additional seabird mitigation device when experiencing seabird captures, or when mitigation devices need to be replaced or repaired; or

IV. **Offal management issues** – see below.

Table 18: Breakdown of reviews with VMP-related issues between the 2014/15 and 2018/19 fishing years.

Type of issue	2014/15	2015/16	2016/17	2017/18	2018/19
Administrative	2	0	2	2	2
Seabird trigger not reported	2	1	0	2	0
Seabird scaring devices	8	5	6	3	2
Offal management issues	13	12	13	9	11
Total	**25**	**18**	**21**	**16**	**15**

4.1.2 OFFAL MANAGEMENT ISSUES

The management of offal is a contributing factor to both seabird and marine mammal captures. Therefore, issues with offal management on board vessels is considered relevant to both VMPs and MMOPs. During the 2018/19 fishing year there were 11 trips that required follow up in relation to offal management related issues (Table 19). Issues are divided into four broad categories: general offal management, net cleaning or leaving the net in the water longer than desirable, floor wash, and breakdown procedures.

Table 19: Breakdown of offal management/food attractant related reviews for VMP/MMOP issues between the 2014/15 and 2018/19 fishing years.

Type of issue	2014/15	2015/16	2016/17	2017/18	2018/19
General offal management	7	9	4	6	7
Net cleaning/time in water	3	0	1	2	2
Floor wash	2	1	4	1	2
Breakdown procedures	1	2	4	0	0
Total	**13**	**12**	**13**	**9**	**11**

4.2 BOTTOM LONGLINE OPERATIONAL PROCEDURES

During the 2018/19 fishing year, Fisheries New Zealand observers audited the performance of ten vessels against the bottom longline operational procedures. Follow up actions were required after five trips in relation to both offal management and seabird scaring devices.

4.3 SEABIRDS

Total seabird captures in deepwater fisheries are estimated using statistical models that are informed by data on observed captures, fishing effort location data and seabird species distribution data.[62] Estimated captures provide an estimate of the total number of captures that would be observed if all effort was observed. They do not take into account any seabird mortalities that may take place due to interactions with fishing gear but are not observed (cryptic mortalities). Cryptic mortalities are considered in the seabird risk assessment which informs the management of seabird risk in New Zealand.

Information regarding observed captures of seabirds (excludes deck strikes) is available for each fishing year, whereas modelled total capture estimates take some time to process. Information presented here represents the best available information at the time of publication. Table 20 reports all observed seabird captures from deepwater fisheries for the 2018/19 fishing year.[63]

[62] The methods used to estimate the total number of protected species captures can be found in; Abraham, E. R., Richard, Y., Berkenbusch, K. & Thompson, F. (2016). Summary of the capture of seabirds, marine mammals, and turtles in New Zealand commercial fisheries, 2002–03 to 2012–13. *New Zealand Aquatic Environment and Biodiversity Report No. 169.* 205 pages.

[63] This table uses raw data from Fisheries New Zealand Observers; species identifications have not yet been verified and are subject to change after specimens are necropsied or observer photos are formally identified.

Table 20: Observed seabird captures for the 2018/19 fishing year from deepwater fisheries (trawl vessels >46 m targeting any stock, trawl vessels >28 m targeting Tier 1 or Tier 2 stocks, trawl vessels <28 m targeting HOK, ORH or SCI and bottom longline vessels targeting ling in quota management areas LIN 3 – LIN 7). Figures exclude deck strikes, impacts against the vessel and records where seabirds ride the codend up the stern ramp and are released alive.

Seabird species		2018/19			
Common name	Species code	Alive	Dead	Other[64]	Total
Albatrosses (unidentified)	XAL	9	6	-	15
Black-browed albatross	XKM	-	1	-	1
Buller's albatross	XBM	4	18	-	22
Buller's and Pacific albatross	XPB	5	26	-	31
Cape petrels	XCP	2	-	-	2
Chatham Island albatross	XCI	-	4	-	4
Flesh-footed shearwater	XFS	-	1	-	1
Giant petrels (unidentified)	XTP	2	4	-	6
Great albatrosses	XGA	2	-	-	2
Grey petrel	XGP	-	1	-	1
Mid-size petrels and shearwaters	XPM	-	1	-	1
Northern giant petrel	XNP	-	2	-	2
Petrel (unidentified)	XPE	7	1	-	8
Petrels, prions and shearwaters	XXP	1	-	-	1
Prions (unidentified)	XPN	-	1	-	1
Procellaria petrels	XPC	8	12	-	20
Royal albatrosses	XRA	2	1	-	3
Salvin's albatross	XSA	3	16	-	19
Seabird (unidentified)	XSB	-	1	-	1
Small seabird	XSS	-	1	-	1
Shearwaters	XSW	-	10	-	10
Shy albatross	XSY	2	1	-	3
Smaller albatrosses	XMA	2	-	-	2
Sooty shearwater	XSH	17	68	-	85
Storm petrels	XST	1	1	-	2
Westland petrel	XWP	-	6	-	6
White-capped albatross	XWM	23	73	1	97
White-chinned petrel	XWC	42	123	-	165
Total		**132**	**379**	**1**	**512**

[64] Includes decomposing birds and records where the observer was unable to determine life status.

Table 21 summarises the proportion of observed seabird captures released alive on the deepwater trawl fleet between the 2014/15 and 2018/19 fishing years. Table 22 summaries the capture method of observed seabird captures on deepwater trawl vessels between the 2014/15 and 2018/19 fishing years. Table 23 shows industry reported seabird captures between the 2014/15 and 2018/19 fishing years.

Table 21. Proportion of observed seabird captures (excluding deck strikes and impacts against the vessel) released alive on deepwater trawl vessels between the 2014/15 and 2018/19 fishing years.

Fishing year	Percentage released alive
2014/15	55%
2015/16	31%
2016/17	25%
2017/18	36%
2018/19	27%

Table 22. Number of observed seabird captures on deepwater trawl vessels classified according to capture method and life status (deck strikes and impacts against the vessel excluded).

Fishing year	Net captures[65]			Warp captures			Other[66]		
	Dead	Alive	Unknown	Dead	Alive	Unknown	Dead	Alive	Unknown
2014/15	257	297	1	21	1	1	17	9	-
2015/16	259	116	1	43	1	3	16	3	-
2016/17	282	99	-	22	1	-	8	5	-
2017/18	268	158	5	33	1	-	8	23	-
2018/19	294	128	-	60	-	-	8	4	-

Table 23: In-zone industry-reported seabird[67] interactions between the 2014/15 and 2018/19 fishing years from the core deepwater fleet.[68]

Fishing year	Large seabirds			Small seabirds			Total
	Alive	Dead	Total	Alive	Dead	Total	
2014/15	114	221	335	281	380	661	**996**
2015/16	95	279	374	109	341	450	**1,028**
2016/17	85	176	261	86	327	413	**674**
2017/18	126	218	344	164	278	442	**786**
2018/19	89	272	361	140	308	448	**809**

[65] Includes birds retrieved from the SLED, caught in the chaffing gear or in the lengthener mesh.

[66] Includes unknown capture methods, birds caught in mitigation devices and birds tangled with paravanes.

[67] Large seabirds constitute albatross and giant petrels; small seabirds constitute petrels, shearwaters, prions and shags

[68] These data are not cumulative with Table 20: an observed capture will also have been reported by the vessel (i.e. the seabird observed captures are the same events as the industry reported seabird captures).

Table 24 shows the number of observed captures, and the observed capture rate (per 100 tows) from deepwater trawl vessels targeting deepwater species (includes some effort from vessels <28 m). Table 25 shows the number of observed, and estimated seabird captures from deepwater ling bottom longline fisheries.

Table 24: Observed seabird captures (excluding deck strikes and impacts against the vessel) for New Zealand deepwater and middle-depth trawl fisheries for the 2018/19 fishing year (includes effort by vessels <28 m for hoki, orange roughy and scampi target fisheries).

Target species	Tows	Tows observed	% of tows observed	Observed captures	Observed capture rate (per 100 tows)
Hoki	12,007	3,486	29%	71	2.04
Hake	77	70	91%	-	-
Ling (LIN 3 – 7)	774	294	38%	5	1.70
Squid	4,278	3,705	87%	347	9.37
Southern blue whiting	747	747	100%	3	0.40
Jack mackerel	1,568	1,062	79%	3	0.28
Scampi	4,372	679	16%	17	2.50
Deepwater (ORH/OEO/CDL/BYX)	4,430	1,224	28%	6	0.49
Barracouta	753	620	82%	24	3.87
Warehou species	360	262	73%	18	6.87
Total	**29,366**	**12,149**	**41%**	**494**	**-**

Table 25: Observed and estimated[69] seabird captures from deepwater ling bottom longline fisheries (LIN 3 – LIN 7) between 2014/15 and 2018/19.

Fishing year	Hooks set	Observed				Estimated	
		Hooks observed	% of hooks observed	Observed seabird captures	Capture rate (per 1,000 hooks)	Estimated total captures	95% confidence interval
2014/15	16,957,923	636,486	4%	16	0.025	537	304 - 990
2015/16	21,229,063	2,059,615	10%	88	0.043	669	427 – 1,076
2016/17	23,786,999	3,800,948	16%	31	0.008	583	326 – 1,078
2017/18	19,232,411	5,113,103	27%	23	0.004	335	198 - 579
2018/19	20,836,681	2,375,340	11%	18	0.008	-	-

Seabird interactions by fishery are reported in Appendix I. More detailed information for captures and estimated captures of individual bird species may be found on the protected species website https://data.dragonfly.co.nz.

[69] Estimated captures for the 2018/19 year not available at the time of publication.

4.3.1 SEABIRD BYCATCH TRIGGER POINT NOTIFICATIONS

All trawl vessels >28 m, those trawl vessels targeting scampi and bottom longline vessels targeting ling stocks LIN 2 – LIN 7 are required to notify DWG any time they capture more than a given number of seabirds (or marine mammals) within a defined time period. These are known as trigger point notifications. When a trigger point is reached, the vessels report the event to DWG within 24 hours. The DWG ELO then contacts the vessel to determine if there was any particular factor (such as a mitigation measure failure, mechanical breakdown or weather conditions) that may have contributed to the trigger event. The DWG ELO will determine what additional mitigation measures the vessel should take (if any).

There were seven trigger point activations for seabird captures in the 2018/19 fishing year. Trigger point specifics and activations are summarised in Table 26 below. Most seabird trigger point activations are a result of net captures.

Fisheries New Zealand monitors trigger point alerts closely and is notified by DWG of the subsequent mitigation actions taken by the vessel. Fisheries New Zealand observers on board deepwater vessels audit performance of the DWG Operational Procedures.

Table 26: Number of seabird trigger point activations (as reported by DWG) between the 2014/15 and 2018/19 fishing years from trawl vessels >28 m (overall length), trawl vessels <28 m targeting scampi or bottom longline vessels targeting ling in quota management areas LIN 2 – LIN 7 (any size).

Species	Trigger points		2014/15	2015/16	2016/17	2017/18	2018/19
	Captures in any 24 hr period	Captures in any 7 day period					
Seabirds - large	3 or more	10 or more of any species	0	8	3	6	6
Seabirds - small	5 or more		11	3	8	7	1

4.4 MARINE MAMMALS

Total marine mammal interactions and captures in deepwater fisheries are estimated using statistical models that are informed by data on observed interactions, fishing effort location data from each deepwater fishery and marine mammal distribution data. The estimates of total captures do not include any estimates of cryptic mortality, although this will be included in the risk assessment modelling.

Information regarding observed captures of marine mammals is available shortly after the completion of each fishing year, whereas modelled total capture estimates take some time to process. Table 27 reports all observed and industry-reported marine mammal captures in deepwater fisheries between the 2016/17 and 2018/19 fishing years.

Table 28 shows observed fur seal capture data from fishing activity targeting deepwater species. Marine mammal interactions by fishery are reported in Appendix I.

Table 27: Observed and industry reported captures (core deepwater fleet) of marine mammals between the 2016/17 and 2018/19 fishing years.[70] Observed records involving decomposing carcasses have not been included.

Species	Observed captures						Industry reported captures (core deepwater fleet)					
	Alive			Dead			Alive			Dead		
	16/17	17/18	18/19	16/17	17/18	18/19	16/17	17/18	18/19	16/17	17/18	18/19
Common dolphin	-	-	-	-	1	-	-	-	-	-	1	-
Dusky dolphin	-	-	-	-	-	-	-	-	-	-	1	2
NZ fur seal	11	10	7	67	68	56	19	8	12	98	108	81
Elephant seal	-	-	-	-	-	-		-	-	1	-	-
Leopard seal	-	-	-	-	-	-	1	-	-	1	-	-
NZ sea lion	-	1	-	3	6	9	-	2	-	3	7[71]	9
Seals and sea lions[72]	-	-	-	-	-	-	-	-	-	-	1	1[73]
Pilot whale	-	-	-	-	1[74]	-	-	-	-	-	1	-
Orca	-	-	-	-	1	-	-	-	-	-	1[75]	-
Baleen whales	-	-	-	-	-	-	-	-	-	-	-	1[76]

Table 28: Observed NZ fur seal captures from New Zealand deepwater and middle-depth trawl fisheries for the 2018/19 fishing year (incudes effort by vessels <28 m for hoki, orange roughy and scampi target fisheries). Records involving decomposing carcasses have not been included.

Target species	Tows	Tows observed	% of tows observed	Observed captures
Hoki	12,007	3,486	29%	22
Hake	77	70	91%	2
Ling (LIN 3 – 7)	774	294	38%	1
Squid	4,278	3,705	87%	25
Southern blue whiting	747	747	100%	11
Jack mackerel	1,568	1,062	79%	-
Scampi	4,372	679	16%	-
Deepwater (ORH/OEO/CDL/BYX)	4,430	1,224	28%	1
Barracouta	753	620	82%	1
Warehou species	360	262	73%	-
Total	**29,366**	**12,149**	**-**	**63**

[70] These are not cumulative; an observed capture will also have been reported by the vessel (i.e. the NZ sea lion observed captures are the same events as the industry reported NZ sea lion captures). In other words, the number reported by observers is independent of those reported by industry.

[71] Two animals were badly decomposed when brought on board the vessel, as verified by the observers who were on board the vessels at the time of capture (these captures are not included within the observed capture figures).

[72] This is a generic description; captures reported under this code are not reported at the species level.

[73] The capture reported using the generic code 'seals and sea lions' occurred north east of Banks Peninsula (statistical area 020) and thus is considered likely to have been a New Zealand fur seal.

[74] The animal in question was significantly predated upon when brought on board and was likely already dead at the time of capture.

[75] A working group formed after the capture concluded that a strike by a container vessel was the most likely cause of death.

[76] A photograph of the capture reported using the generic code 'baleen whales' was subsequently identified as a neonate Risso's dophin.

4.4.1 MARINE MAMMAL OPERATIONAL PROCEDURES

The Marine Mammal Operational Procedures (MMOPs) aim to reduce the risk of incidental captures of marine mammals during deepwater fishing activity. Measures included in the MMOPs include minimising the amount of time the trawl gear is on the surface, removing stickers from the net before shooting it, moving away from large congregations of marine mammals before shooting if possible, and always be on the lookout for marine mammals around fishing gear. Specific measures are included to minimise the risk of dolphin captures including information on the time of day and areas where the risk of dolphin captures is highest. It also includes trigger points which should be reported to DWG within 24 hours.

4.4.2 MARINE MAMMAL TRIGGER POINT NOTIFICATIONS

All trawl vessels >28 m are required to notify DWG any time they capture more than a given number of marine mammals within a defined time period. There were 17 trigger point activations for marine mammal captures during the 2018/19 fishing year. These are summarised in Table 29 below.

Table 29: Marine mammal trigger point activations between the 2014/15 and 2018/19 fishing years.

Species	Trigger Points		2014/15	2015/16	2016/17	2017/18	2018/19
	Captures in any 24 hr period	Captures in any 7 day period					
NZ fur seal	2	5	8	6	5	6	8
Common dolphin	1	-	14	2	0	1	0
NZ sea lion	1	-	8	3	3	8	9
Other marine mammal[77]	1	-	0	0	1	2[78]	2[79]

4.5 SHARKS

Management Objectives 6 and 8 in the National Deepwater Plan address the need to manage and monitor shark interactions with deepwater fishing activity.[80] The management of sharks in New Zealand is guided by the National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks), which is currently under review. The NPOA-Sharks sets out goals and five-year objectives to guide the conservation and management of sharks. The NPOA Sharks objectives that are most immediately relevant to deepwater fisheries are the objective to eliminate shark finning in New Zealand and to reduce the use of generic reporting codes.

On 1 October 2014 it became illegal for commercial fishers to remove the fins from any shark and discard the body of that shark at sea (shark finning). Fishers are still able to land shark fins, however conditions apply depending on the species concerned (summarised in the Table 30 below). It also became possible for fishers to return dead mako, porbeagle and blue sharks to the sea and balance catch against Annual Catch Entitlement (ACE), fishers were already able to return these species, as well as rig and school shark, to the sea if they were alive and likely to survive.

[77] All cetaceans other than common dolphin and all pinnipeds other than New Zealand fur seal and New Zealand sea lion.

[78] One orca and one unidentified dolphin.

[79] One capture event involving the capture of two dusky dolphins (both dead at the time of capture) and one involving the capture of a neonate Risso's dolphin.

[80] Throughout this section the term sharks refers to all species in the class Chondrichthyes, which includes all cartilaginous fish such as sharks, skates, rays and chimaeras.

Table 30: Summary of conditions that apply if fishers wish to land shark fins.

Approach	Description	Applicable species
Ratio	Fins must be stored and landed separately by species. The weight of fins landed must not exceed a specified percentage of the greenweight of the shark. Weight of fins must be reported on landing returns. The ratio applies to landings on a trip-by-trip basis.	Elephant fish
		Dark ghost shark
		Mako shark
		Pale ghost shark
		Porbeagle shark
		Rig
		School shark
Fins artificially attached	After being processed to the dressed state, fins must be re-attached to the shark by some artificial means. Landings to be reported with landed state of SFA (shark fins attached).	Blue shark
Fins naturally attached	After being processed to the headed and gutted state, the fins must remain attached to the body by some portion of uncut skin. Landings to be reported with landed state of SFA (shark fins attached).	Spiny dogfish
		All non-QMS species

In 2013, a trigger point was added to the Deepwater Fisheries Operational Procedures that requires vessels to report any basking shark captures to DWG within 24 hours; seven basking shark triggers were reported during the 2018/19 fishing year. Table 31 shows the number of observed and industry reported protected shark captures in deepwater fisheries between the 2014/15 and 2018/19 fishing years.

Table 31: Observed and industry reported captures of protected shark species from the core deepwater fishing fleet between the 2014/15 and 2018/19 fishing years.[81]

Species	Observed Captures					Industry-reported				
	14/15	15/16	16/17	17/18	18/19	14/15	15/16	16/17	17/18	18/19
Basking shark	5	1	5	1	7	11	5	8	1	7
White pointer shark	0	1	3	5	3	0	1	4	5	3

Sharks are classified as: rays and skates, sharks and dogfish, and chimaeras. Within these three classifications, some species are protected, some are included in the QMS, and some are reported using generic codes that do not allow for species determination.

Reporting for sharks in connection with deepwater fisheries includes information on the total interactions with shark species during deepwater fishing activity, interactions with protected shark species, the level of the use of generic reporting codes, and information about the utilisation and processing of sharks in deepwater fisheries. Table 32 shows the reported landings of sharks by the core deepwater fleet during the 2018/19 fishing year.

[81] These are not cumulative, an observed capture will also have been reported by the vessel (i.e. the observed white pointer shark captures are the same events as those reported by industry).

Table 32: Reported landings of sharks from the core deepwater fishing fleet in 2018/19 (tonnes).

Species	Chimaeras[82]	Rays & Skates	Sharks & Dogfish	Total
Generic reporting code	3	6	347	356
QMS species	1,418	671	4,300	6,389
Other	143	20	1,286	1,449
Total	**1,564**	**697**	**5,933**	**8,194**

Generic reporting codes make it impossible to accurately quantify the captures of specific shark species. The NPOA-Sharks identified the use of generic reporting codes for shark catches as an area in need of attention from Fisheries New Zealand in future. Table 33 shows that the use of generic reporting codes has decreased over time; the decline in the use of generic reporting codes will allow improved quantification of shark catches in the future.

Table 33: Use of generic reporting codes from both observer data and reported landings between the 2014/15 and 2018/19 fishing year (as a percent of total reported shark landings/catches) by the core deepwater fleet.

Year	% industry-reported h landings with generic codes	% of observed shark catches with generic codes
2014/15	4%	1%
2015/16	6%	3%
2016/17	5%	1%
2017/18	3%	1%
2018/19	4%	1%

Details of QMS shark landings by the core deepwater fleet during 2018/19 are summarised in Table 34. No vessels from the core deepwater fleet reported landing fins from a shark species subject to the finweight/greenweight ratio or any sharks under the processed state code SFA (shark fins attached).

[82] Cartilaginous fish in the order Chimaeriformes (variously known as ghost shark, elephant fish or rabbit fish)

Table 34: Details of QMA shark species landed by the core deepwater fleet during the 2018/19 fishing year (tonnes).

Species	Total landings[83]	Landed green	Landed processed (exc MEA)	Mealed	Discarded under observer approval	Returned dead (6TH schedule)	Returned alive (6th schedule)	Accidental loss
Blue shark	10	-	-	<1	N/A	7	3	<1
Elephant fish	5	<1	1	2	2	N/A	N/A	-
Ghost shark	558	19	413	70	52	N/A	N/A	<1
Mako shark	21	-	-	<1	N/A	17	4	-
Pale ghost shark	856	3	635	208	7	N/A	N/A	2
Porbeagle shark	33	-	<1	<1	N/A	26	7	-
Rig	17	<1	7	4	6	N/A	<1	-
Rough skate	238	81	76	55	8	N/A	17	<1
School shark	202	<1	156	26	15	N/A	2	3
Smooth skate	432	6	287	79	8	N/A	51	1
Spiny dogfish	4,015	94	3	1,555	N/A	2,361		1
Total	6,387	203	1,578	1,999	98	50[84]	84[85]	7

4.6 TIER 3 SPECIES

Tier 3 species are non-QMS species that are caught during fishing activity for QMS species. The top 40 Tier 3 species landed are reported in Table 35, full details of all Tier 3 species caught in deepwater fisheries can be found in Appendix III. A quantitative analysis of both QMS and non-QMS species bycatch in deepwater fisheries can be found online.[86]

[83] Total landings may not equal the sum of fish landed, returned or accidentally lost due to rounding errors and/or fish that were reported using other landed destination types (e.g. consumed on board, used as bait or retained by an observer as a specimen).

[84] Does not include spiny dogfish returns.

[85] See above.

[86] Finucci, B.; Edwards, C.T.T; Anderson, O.F.; Ballara, S.L. (2019). Fish and invertebrate bycatch in New Zealand deepwater fisheries from 1990–91 until 2016–17.

Table 35: Landings (tonnes) of the top 40 Tier 3 species by the core deepwater fleet between the 2014/15 and 2018/19 fishing year.

Species code	Common name	2014/15	2015/16	2016/17	2017/18	2018/19
JAV	Javelinfish	4,234	4,300	5,366	6,102	3,905
RAT	Rattails	3,682	3,630	5,069	4,539	3,758
SDO	Silver dory	231	230	192	295	739
SND	Shovelnose dogfish	251	429	377	492	484
OSD	Other sharks and dogfish	189	291	268	248	301
ETB	Baxter's lantern dogfish	290	253	309	325	297
STU	Slender tuna	235	177	209	628	291
RHY	Common roughy	116	67	64	160	237
SSI	Silverside	123	134	169	589	219
NCB	Smooth red swimming crab	186	143	491	245	214
CSQ	Leafscale gulper shark	123	178	127	195	161
LCH	Long-nosed chimaera	111	128	138	157	138
SLK	Slickhead	107	115	166	191	127
BEN	Scabbardfish	44	50	90	133	122
WSQ	Warty squid	89	84	173	140	117
FHD	Deepsea flathead	105	99	100	147	106
BSH	Seal shark	87	81	139	113	100
HCO	Hairy conger	63	90	80	53	89
YBO	Yellow boarfish	8	6	8	16	88
SFI	Starfish	48	73	70	96	85
HJO	Johnson's cod	20	34	61	55	73
ETL	Lucifer dogfish	32	34	36	52	56
BEL	Bellowsfish	53	56	106	71	54
DWD	Deepwater dogfish	68	70	71	79	46
NSD	Northern spiny dogfish	50	27	29	27	45
OPE	Orange perch	10	24	15	13	42
BBE	Banded bellowsfish	39	31	19	81	41
CRB	Crab (unspecified)	37	80	57	68	39
SRH	Silver roughy	63	25	33	49	39
RUD	Rudderfish	57	47	46	39	39
CAR	Carpet shark	60	46	48	32	37
CDO	Capro dory	58	34	28	48	31
CYP	Longnose velvet dogfish	10	20	26	34	31
THR	Thresher shark	31	23	32	34	31
DWE	Deepwater eel (unspecified)	16	22	40	55	31
POP	Porcupine fish	31	26	31	28	28
TOA	Toadfish	28	15	27	32	27
LAN	Lanternfish	3	6	6	14	24
SUN	Sunfish	20	13	12	27	23
MOD	Morids	62	63	99	53	23

4.7 BENTHIC INTERACTIONS

4.7.1 BENTHIC BYCATCH

Targeting many deepwater species utilises fishing methods resulting in regular contact between fishing gear and the seabed. This can lead to bycatch of benthic organisms including corals, sponges, and sea anemones. In New Zealand all black corals, gorgonian corals, stony corals, and hydrocorals are protected under the Wildlife Act 1953. Details of observed and industry-reported benthic bycatch between 2016/17 and 2018/19 are shown in Table 36.

Table 36: Observed catch of benthic species (kg) from deepwater trawl vessels and industry reported catch by the core deepwater feet between the 2016/17 and 2018/19 fishing years (excludes catches from outside the EEZ).

Common name	Observed			Industry-reported		
	16/17	17/18	18/19	16/17	17/18	18/19
Anemones	11,718	18,463	7,773	285	5,754	4,275
Corals	293	240	631	8,885	82	163
Corals (generic codes)	13,257	2,166	8,141	13,529	3,902	27,922
Hydroids	42	23	18	-	-	-
Sea pens	47	169	104	-	-	-
Sponges	56,742	47,692	18,752	116,555	89,535	78,622

4.7.2 TRAWL FOOTPRINT

The most recent (2020) iteration of the deepwater trawl footprint[87] estimated the extent of bottom contact by trawl vessels targeting Tier 1 and Tier 2 species between the 2007/08 and 2017/18 fishing years.[88] The reporting is based on all relevant TCEPR and TCER and is reviewed each year through the Aquatic Environment Working Group. Trawled area is reported against the 'fishable area', which is defined as the area shallower than 1600 m and not closed to bottom trawling (by BPAs, seamount closures or marine reserves).

The Tier 1 and Tier 2 target fish stock footprint between 2007/08 and 2017/18 was estimated at 177,267 km^2. This represents 4.3% of the seafloor between the coastline and the outer boundary of the EEZ and 13% of the seafloor that is open to bottom trawling down to 1600 m. The Tier 1 target fisheries accounted for 91% of the total 2007/08 – 2017/18 deepwater footprint, with hoki effort contributing approximately 51% of the Tier 1 footprint (Figure 4). Between 2007/08 and 2017/18 hoki trawls covered about 5.6% of the seafloor open to fishing. The total trawl footprint for each of the other Tier 1 targets covered between 1.6% (jack mackerel) and 0.4% (oreo) of the seafloor out to the outer EEZ boundary (with the remainder taken up by the Tier 2 target footprint).

[87] The 2020 deepwater trawl footprint has yet to be finalised, therefore all figures presented in this report are preliminary. The finalised report is expected to be published in early 2020. The most recently published iteration covers fishing up to the end of the 2016/17 fishing year; https://www.mpi.govt.nz/dmsdocument/37050-aebr-229-extent-of-bottom-contact-by-new-zealand-commercial-trawl-fishing-for-deepwater-tier-1-and-tier-2-target-species-determined-using-catchmapper-software-fishing-years-200817

[88] The 2019 & 2020 trawl footprint reports differ from those published previously. The most recent iterations calculate the cumulative deepwater trawl footprint back to 2007/08 (previous versions have calculated the footprint back to 1989/90) and also used a newly developed software tool (CatchMapper) to generate the bottom-contacting trawl footprint. The 2018 deepwater trawl footprint can be accessed online;
Baird, S.J.; Wood, B.A. (2018). Extent of bottom contact by New Zealand commercial trawl fishing for deepwater Tier 1 and Tier 2 target fishstocks, 1989-90 to 2015-16. *New Zealand Aquatic Environment and Biodiversity Report No. 193*. 102 p.

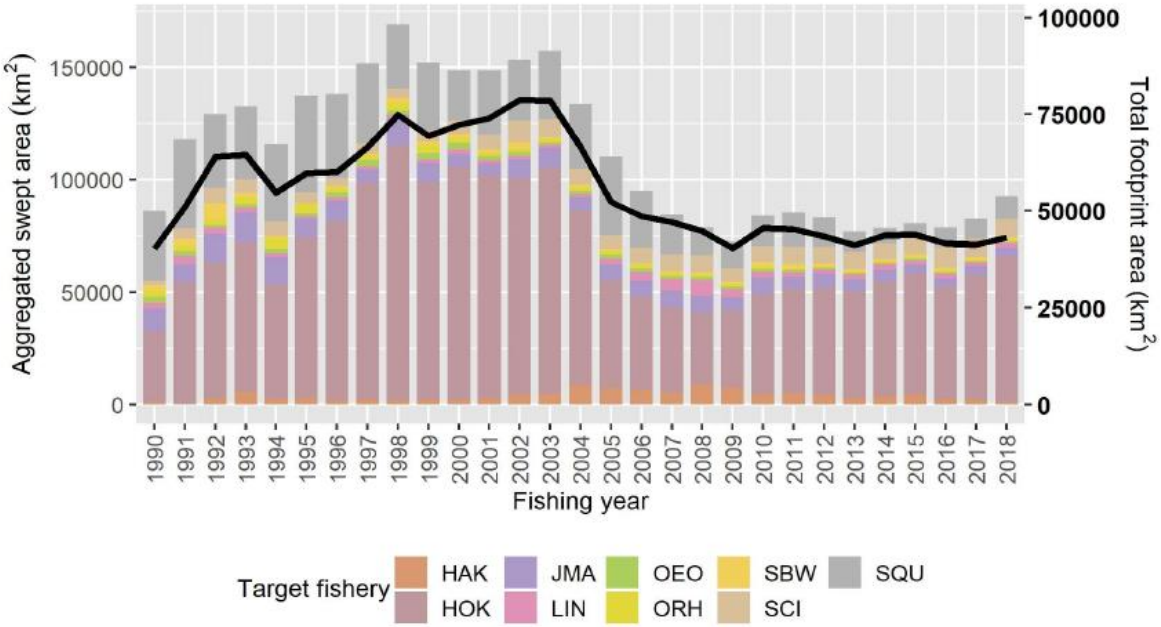

Figure 4: The annual aggregated swept area (km²) from Tier 1 target fisheries (bars) and total trawl footprint (black line), by fishing year, between the 1989/90 and 2017/18 fishing years.

Estimating the area of seafloor contacted in 2017/18 that has not been previously contacted is problematic given the difference in methodology between the 2019 and 2020 iterations, and those from previous years.

During 2017/18, 46 tows contacted 5 km cells that were not contacted by the 1989/90 – 2016/17 footprint. The majority of these tows targeted either orange roughy (on the Chatham Rise or the Westpac Bank) or scampi (in FMA 7). Approximately 24% of tows in previously 'uncontacted cells' areas during 2017/18 were observed with 36 kg of smooth deep-sea anemones observed caught. There was no observed, or industry reported catch of sponges or corals from tows in previously 'uncontacted cells' during 2017/18.

The distribution of the cumulative 2007/08 – 2017/18 and 2017/18 trawl footprints for Tier 1 and Tier 2 targets is shown in Figure 5. Swept area for each individual Tier 1 and Tier 2 species is reported in Appendix I.

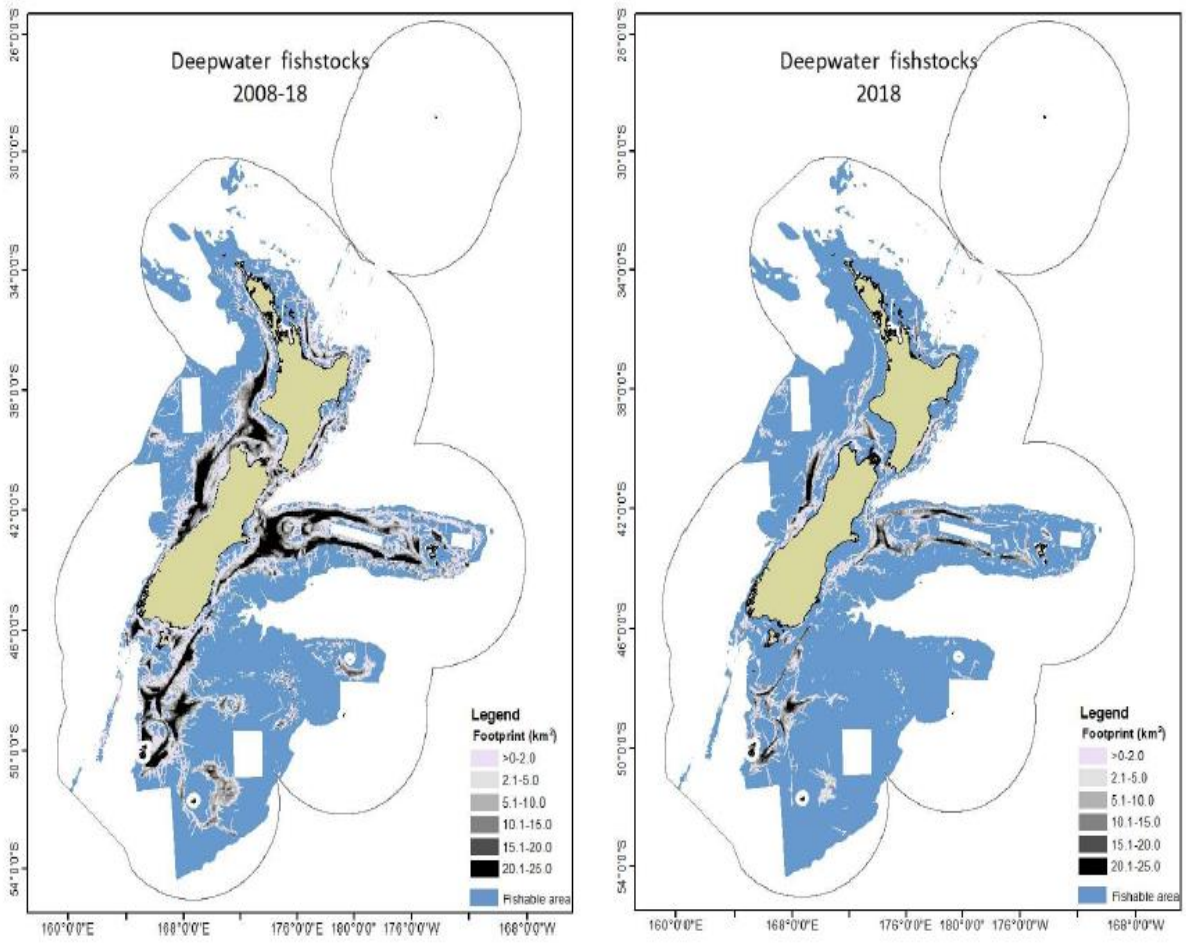

Figure 5: Distribution of the cumulative 2007/08 – 2017/18 trawl footprint, and the annual 2017/18 trawl footprint for Tier 1 and Tier 2 target species combined.

Appendix I: Summaries of Deepwater Fisheries for 2018/19

ALFONSINO (TIER 2) BYX

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
BYX 1	11	304	300	2	2	0
BYX 2	1,514	-	1,575	-	-	-
BYX 3	807	-	1,010	-	-	-
BYX 7	11	-	80.5	-	-	-
BYX 8	<1	-	10	-	-	-

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	B_{MSY} (30-50% B_0)	BYX 1	B_{2010} 'Likely' (>60%) to be at or above the target
	40% B_0	All other stocks	Unknown
Soft Limit	20% B_0	BYX 1	B_{2010} 'Very Unlikely' (<10%) to be below the soft limit
		All other stocks	Unknown
Hard Limit	10% B_0	BYX 1	B_{2010} 'Very Unlikely' (<10%) to be below the hard limit
		All other stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
BYX 1	$1.98	$2.20	$2.64	$3.08	$3.52	$3.96	$4.40	$103
BYX 3								$0
BYX 7								$0
BYX 8								$0
BYX 2		**100-110%**	**110-130%**	**130-150%**	**150-170%**	**170-190%**	**190%+**	**2018/19 Actual**
		$2.20	$2.64	$3.08	$3.52	$3.96	$4.40	$0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 154 km^2 (<0.1%)	2007/08 – 2017/18: 1,952 km^2 (0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 66.8 m
Export earnings 2019	$NZ 13.5 m FOB (includes catch taken outside the EEZ)

BARRACOUTA (TIER 2) BAR

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
BAR 4	2,016	-	3,019	-	-	-
BAR 5	8,131	8,370	8,200	3	2	165
BAR 7	4,053	-	11,173	-	-	-

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	BAR 4	Unknown
		BAR 5	Unknown
		BAR 7	Unknown
Soft Limit	20% B_0	BAR 4	Unknown
		BAR 5	B_{2015} is 'Very Unlikely' (<10%) to be below the soft limit
		BAR 7	B_{2015} is 'Very Unlikely' (<10%) to be below the soft limit
Hard Limit	10% B_0	BAR 4	Unknown
		BAR 5	B_{2015} is 'Very Unlikely' (<10%) to be below the hard limit
		BAR 7	B_{2015} is 'Very Unlikely' (<10%) to be below the hard limit

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
BAR 7	$0.12	$0.24	$0.29	$0.33	$0.38	$0.43	$0.48	$0

Stock	**100-110%**	**110-120%**	**120%+**	**2018/19 Actual**
BAR 4	$0.25	$0.50	$1.00	$0
BAR 5				$1

Environmental indicators and observer coverage[89]			
Observer coverage	2016/17: 88% tows observed	2017/18: 88% tows observed	2018/19: 82% tows observed
Seabirds	2016/17: 38 observed captures; 43 estimated	2017/18: 19 observed captures; 26 estimated	2018/19: 24 observed captures
Fur seals	2016/17: 5 observed captures	2017/18: 2 observed captures	2018/19: 1 observed capture
Benthic interactions (fishable area trawled)	2017/18: 2,092 km^2 (0.2%)	2007/08 – 2017/18: 18,620 km^2 (1.3%)	

Economic indicators (calendar years)	
Quota value 2018	$NZ 79.6 m (includes BAR 1 holdings)
Export earnings 2019	$NZ 24.1 m FOB

[89] Trawl vessels greater than 28 m in length targeting all barracouta stocks.

BLACK CARDINALFISH (TIER 2) CDL

2018/19 Landings, catch limits and allowances (in tonnes)						
Stock	**2018/19 Catch**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
CDL 1	40	1,320	1,200	0	0	120
CDL 2	372	460	440	0	0	20
CDL 3	177	196	196	0	0	0
CDL 4	13	66	66	0	0	0
CDL 5	87	22	22	0	0	0
CDL 6	1	1	1	0	0	0
CDL 7	6	39	39	0	0	0
CDL 8	0	0	0	0	0	0
CDL 9	2	4	4	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	CDL 2, 3 & 4	B_{2009} estimated to be 12% B_0. 'Very Unlikely' (<10%) to be at or above target
		All other stocks	Unknown
Soft Limit	20% B_0	CDL 2, 3 & 4	B_{2009} 'Likely' (>60%) to be below the soft limit
		All other stocks	Unknown
Hard Limit	10% B_0	CDL 2, 3 & 4	B_{2009} 'About as Likely as Not' (40-60%) to be below the hard limit
		All other stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2018/19 Actual**
		100%+		
CDL 1 CDL 6 CDL 7 CDL 8 CDL 9	$0.15	$0.30		$0 $7 $0 $0 $0
CDL 5	$0.26	$0.52		$33,879
Stock	**Interim rate**	**100-120%**	**120%+**	**2018/19 Actual**
CDL 2	$0.30	$0.60	$0.69	$0
CDL 3 CDL 4	$0.26	$0.52	$0.60	$0 $0

Environmental indicators and observer coverage			
Observer coverage	2016/17: 14% tows observed	2017/18: 0% tows observed	2018/19: 10% tows observed
Seabirds	2016/17: 0 observed captures; 0 estimated	2017/18: 0 observed captures; 0 estimated	2018/19: 0 observed captures
NZ fur seal	2016/17: 0 observed captures	2017/18: 0 observed captures	2018/19: 0 observed captures
Benthic interactions (fishable area trawled)	2017/18: 35 km^2 (<0.1%)		2007/08 – 2017/18: 671 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 4.4 m
Export earnings 2019	$NZ 1.0 m FOB

DARK GHOST SHARK (TIER 2) GSH

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
GSH 4	166	370	370	0	0	0
GSH 5	51	109	109	0	0	0
GSH 6	68	95	95	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	GSH 4, GSH 5 & GSH 6	Unknown
Soft Limit	20% B_0	GSH 4, GSH 5 & GSH 6	Unknown
Hard Limit	10% B_0	GSH 4, GSH 5 & GSH 6	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
GSH 4 GSH 5 GSH 6	$0.36	$0.40	$0.48	$0.56	$0.64	$0.72	$0.80	$0 $0 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 0 km^2	2007/08 – 2017/18: 84 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 6.7 m (includes GSH 1, GSH 2, GSH 3, GSH 7, GSH 8 & GSH 9 holdings)
Export earnings 2019	$NZ 0.6 m FOB (includes both pale and dark ghost shark, export statistics are not provided for individual ghost shark species)

DEEPWATER CRAB SPECIES (TIER 2) KIC/GSC/CHC:

2017/18 Landings, catch limits and allowances [90] (tonnes) (only shown for stocks where catches > 0.1 t were taken)						
Stock	**2017/18 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
KIC 3	0.4	10	10	0	0	0
KIC 5	0.4	10	10	0	0	0
KIC 6	0.7	10	10	0	0	0
GSC 3	6	15	14	0	0	1
GSC 5	60	20	19	0	0	1
GSC 6A	89	165	148	0	0	17
GSC 6B	0.2	250	237	0	0	13

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All CHC, GSC & KIC stocks	Unknown
Soft Limit	20% B_0	All CHC, GSC & KIC stocks	Unknown
Hard Limit	10% B_0	All CHC, GSC & KIC stocks	Unknown

2017/18 Deemed value rates (per kg) and invoices (only shown for stocks where catches > 0.1 t were taken)								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2017/18 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
KIC 3 KIC 5 KIC 6	$1.62	$1.80	$2.16	$2.52	$2.88	$3.24	$3.60	$3 $0 $0
GSC 3 GSC 5 GSC 6A GSC 6B	$0.09	$0.10	$0.12	$0.14	$0.16	$0.18	$0.20	$0 $7,329 $161 $0

Economic indicators (calendar year)	
Quota value 2018	$NZ 3.3 m (all deepwater crab species combined)
Export earnings 2019	No export information specific to deepwater crabs is currently available

[90] All catch information is based on the April fishing year (1 April 2018 – 31 March 2019).

BLUE (ENGLISH) MACKEREL (TIER 2) EMA

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
EMA 3	32	392	390	1	1	0
EMA 7	2,626	3,352	3,350	1	1	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	EMA 3 & EMA 7	Unknown
Soft Limit	20% B_0	EMA 3 & EMA 7	Unknown
Hard Limit	10% B_0	EMA 3 & EMA 7	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
EMA 3 EMA 7	$0.13	$0.26	$0.31	$0.36	$0.42	$0.47	$0.52	$3 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 0 km^2	2007/08 – 2017/18: 176 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 28.8 m (includes EMA 1 & EMA 2 holdings)
Export earnings 2019	$NZ 16.4 m FOB (includes all stocks)

FROSTFISH (TIER 2) FRO

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
FRO 3	12	176	176	0	0	-
FRO 4	100	28	28	0	0	-
FRO 5	4	135	135	0	0	-
FRO 6	<1	11	11	0	0	-
FRO 7	1,999	2,625	2,623	1	1	-
FRO 8	507	649	649	0	0	-
FRO 9	171	140	138	1	1	-

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	FRO 3 – FRO 9	Unknown
Soft Limit	20% B_0	FRO 3 – FRO 9	Unknown
Hard Limit	10% B_0	FRO 3 – FRO 9	Unknown

2018/19 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual rate for catch in excess of ACE[91]**	**2018/19 Actual**
FRO 3	$0.17	$0.34	$2
FRO 4	$0.22	$0.24	$16,185
FRO 5	$0.08	$0.15	$0
FRO 6			$0
FRO 7			$0
FRO 8	$0.14		$0
FRO 9			$2,741

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 22 km^2 (<0.1%)	2007/08 – 2017/18: 99 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 5.0 m (includes FRO 1 & FRO 2 holdings)
Export earnings 2019	No export information specific to frostfish is currently available

[91] Differential deemed value rates are not set for frostfish stocks.

GEMFISH (TIER 2) SKI

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SKI 3	576	300	300	0	0	0
SKI 7	934	300	300	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	SKI 3 & SKI 7	Unknown
Soft Limit	20% B_0	SKI 3 & SKI 7	Unknown
Hard Limit	10% B_0	SKI 3 & SKI 7	$B_{2017\text{-}18}$ unlikely (<40%) to be below the hard limit

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
SKI 3 SKI 7	$0.65	$0.72	$0.86	$1.01	$1.15	$1.30	$1.44	$310,235 $803,092

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 20 km^2 (<0.1%)	2007/08 – 2017/18: 738 km^2 (0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 14.9 m (includes SKI 1 & SKI 2 holdings)
Export earnings 2019	$NZ 2.3 m FOB (includes all stocks)

HAKE (TIER 1) HAK

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
HAK 1	896	-	3,701	-	-	-
HAK 4	183	1,818	1,800	0	0	18
HAK 7	1,563	5,120	5,064	0	5	51

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	HAK Sub-Antarctic[92]	B_{2018} estimated to be 49% B_0. 'Very Likely' (>90%) to be at or above the target
		HAK Chatham Rise[93]	B_{2016} estimated to be 48% B_0. 'Likely' (>60%) to be at or above the target
		HAK 7	B_{2019} estimated to be 17% B_0. 'Exceptionally Unlikely' (<1%) to be at or above the target.
Soft limit	20% B_0	HAK Sub-Antarctic	B_{2018} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		HAK Chatham Rise	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		HAK 7	B_{2019} 'About as Likely as Not' (40%-60%) to be below the soft limit.
Hard limit	10% B_0	HAK Sub-Antarctic	B_{2018} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		HAK Chatham Rise	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		HAK 7	B_{2019} either 'Very Unlikely' (<10%) or 'Exceptionally Unlikely' (<1%) to be below the hard limit (survey & CPUE model respectively)

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
HAK 1 HAK 4 HAK 7	$0.80	$1.60	$1.92	$2.24	2.56	2.88	3.20	$34 $0 $0

Environmental indicators and observer coverage[94]				
Observer coverage		2016/17: 95% tows observed	2017/18: 99% tows observed	2018/19: 91% tows observed
Seabirds		2016/17: 1 observed capture; 1 estimated	2017/18: 1 observed capture; 1 estimated	2018/19: 0 observed captures
Marine mammals	NZ fur seal	2016/17: 2 observed captures	2017/18: 0 observed captures	2018/19: 1 observed capture
Benthic interactions (fishable area trawled)		2017/18: 709 km^2 (0.1%)	2007/08 – 2017/18: 10,544 km^2 (0.8%)	

Economic indicators (calendar year)	
Quota value 2018	$NZ 154.8 m
Export earnings 2019	$NZ 11.3 m FOB

[92] HAK Sub-Antarctic is defined as all of HAK 1 south of the Otago Peninsula.

[93] HAK Chatham Rise is defined as all of HAK 4 plus that part of HAK 1 north of the Otago Peninsula.

[94] Trawl vessels >28 m in length.

HOKI (TIER 1) HOK

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
HOK1	122,287	151,540	150,000	20	20	1,500

Reference points and current status			
Target range	35-50% B_0	Eastern stock[95]	B_{2019} estimated to be either 66% B_0 or % B_0. 'Virtually Certain' (>99%) to be at or above the lower end of the target range and 'Likely' (>60%) to be at or above the upper end of the target range
		Western stock[96]	B_{2019} estimated to be either 56% B_0 (two stock) or 29% B_0 (west focus).[97] 'About as Likely as Not' (40-60%) to be at or above the upper end of the target range
Soft limit	20% B_0	Eastern stock	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		Western stock	B_{2019} 'Unlikely' (<10%) to be below the soft limit
Hard limit	10% B_0	Eastern stock	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		Western stock	B_{2019} 'Very Unlikely' (<10%) to be below the soft limit

2018/19 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2018/19 Actual**
		100-102%	**102%+**	
HOK 1	\$0.45	\$0.90	\$1.30	\$8

Environmental indicators and observer coverage				
Observer coverage		2016/17: 23% tows observed	2017/18: 35% tows observed	2018/19: 29% tows observed
Seabirds		2016/17: 59 observed captures; 291 estimated	2017/18: 143 observed captures; 334 estimated	2018/19: 70 observed captures
Marine mammals	NZ fur seal	2016/17: 37 observed captures	2017/18: 41 observed captures	2018/19: 22 observed captures
	NZ sea lion	2016/17: 0 observed captures	2017/18: 1 observed capture	2018/19: 1 observed capture
Benthic interactions (fishable area trawled)		2017/18: 29,983 km^2 (2.2%)	2007/08 to 2016/17: 78,308 km^2 (5.6%)	

Economic indicators (calendar year)	
Quota value 2018	\$NZ 1,367.9 m
Export earnings 2019	\$NZ 297 m FOB

Eastern and Western Catch Limit Reporting

The hoki fishery is considered to consist of two biological stocks; an eastern stock and western stock. Agreements between the Minister and the fishing industry have seen catch limits apply to each stock since 2001/02. For the 2018/19 fishing year, owners of the majority of hoki quota had formally entered into the catch limit agreement requested by the Minister. The east/west catch limit regime is administered by FishServe and monitored by DWG.

Table 37 provides details on the catch limits and catch amounts for the 2018/19 fishing year.

[95] The Eastern stock is taken to be the east coast of the North and South Islands, Mernoo Bank, Chatham Rise and Cook Strait.

[96] The Western stock is taken to be the west coast of the North and South Islands and the area south of New Zealand including Puysegur, Snares and the Sub-Antarctic.

[97] The 'two stock' update is consider to overestimate stock status whereas the 'west focus' may underestimate stock status.

Table 37: Catch limits and actual catch estimates for 2018/19 fishing year (tonnes).

Catch limits	2018/19 Planned	Catch within agreement (from FishServe)	Estimated catch (all fishers)	Available ACE[98]
Eastern stock	60,000	63,524	62,752	65,892
Western stock	70,000[99]	56,953	54,130	68,639[100]

1.1.1 Hoki Operational Procedures

Hoki Operational Procedures stipulate the non-regulatory management measures agreed between HOK 1 quota owners, HOK 1 ACE holders and Fisheries New Zealand. The purpose of the Hoki Operational Procedures is to monitor and manage fishing effort for hoki within agreed hoki management areas (HMAs) and hoki seasonal spawn areas (HSSAs). Hoki Operational Procedures are monitored and administered by DWG.

HMAs are areas where there is information to demonstrate the presence of a high abundance of juvenile hoki (for these purposes hoki <55 cm in total length). Trawlers > 28 m in length are not permitted to target hoki within HMAs. Fisheries New Zealand provides DWG summaries of fishing effort, estimated catch and hoki length frequency information from within, and the immediate vicinity of HMAs on a quarterly basis. Table 38 summaries fishing activity within HMAs between the 2011/12 and 2018/19 fishing years.

To allow for a period of undisturbed spawning, no trawler, regardless of size is permitted to target hoki within four designated HSSAs at certain times. Fisheries New Zealand monitored fishers' adherence to the HSSA requirements during the winter spawn fishery. No targeting of hoki within any HSSA occurred during the specified time periods.

[98] Available ACE for the eastern and western stocks is allocated on a pro-rata basis from total available HOK 1 ACE of 164,730 tonnes.

[99] For the 2018/19 fishing year, quota owners agreed to shelve 20,000 tonnes of HOK 1W ACE (along with any HOK1 ACE carried forward from the 2017/18 fishing year).

[100] Total HOK 1W ACE minus that shelved by quota holders.

Table 38: Summary of HMA fishing activity by trawl vessels >28 m in length between the 2011/12 and 2018/19 fishing years.

Fishing year	Number of vessels that fished in HMA	Number of HOK target tows[101]	Number of non-HOK target tows	Reported estimated catch of HOK (t)	Estimated catch of all species (t)
Canterbury Banks					
2011/12	24	16	454	494	7,301
2012/13	20	17	471	772	7,849
2013/14	19	41	584	692	9,094
2014/15	21	18	336	576	4,014
2015/16	21	45	308	1,929	4,870
2016/17	20	33	454	1,028	7,380
2017/18	21	47	638	1,347	9,975
2018/19	18	18	143	303	1,795
Mernoo Bank					
2011/12	17	14	68	456	1,310
2012/13	14	8	178	322	3,092
2013/14	16	9	231	346	4,102
2014/15	20	12	193	290	3,231
2015/16	19	11	201	602	2,529
2016/17	18	3	157	853	2,405
2017/18	20	16	263	581	2,577
2018/19	24	4	1,112	429	12,523
Puysegur Bank					
2011/12	14	2	98	197	1,167
2012/13	12	2	82	80	781
2013/14	11	0	118	294	1,432
2014/15	10	0	96	454	1,392
2015/16	13	1	173	208	2,382
2016/17	10	0	98	150	1,033
2017/18	10	0	66	203	808
2018/19	10	0	65	188	1.087
Cook Strait[102]					
2011/12	0	0	0	0	0
2012/13	1	3	0	1	1
2013/14	0	0	0	0	0
2014/15	2	2	0	<1	32
2015/16	0	0	0	0	0
2016/17	4	3	1	39	40
2017/18	1	1	0	<1	<1
2018/19	0	0	0	0	0

[101] The majority of tows targeting hoki inside an HMA were undertaken very close to HMA boundaries.

[102] Tows conducted within the Cook Strait HMA during 2012/13 and 2014/15 were undertaken as part of a research project to estimate hoki spawning abundance.

JACK MACKEREL (TIER 1) JMA

2019/10 Landings, Catch limits and Allowances (tonnes)						
Stock	**2010/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
JMA 3	4,650	9,000	8,780	20	20	180
JMA 7	31,752	-	32,537	-	-	-

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	JMA 3 & JMA 7	Unknown
Soft Limit	20% B_0	JMA 3 & JMA 7	Unknown
Hard Limit	10% B_0	JMA 3 & JMA 7	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
JMA 3	$0.08	$0.09	$0.11	$0.13	$0.14	$0.16	$0.18	$0
JMA 7	$0.14	$0.15	$0.18	$0.21	$0.24	$0.27	$0.30	$30

Environmental indicators and observer coverage				
Observer coverage		2016/17: 72% tows observed	2017/18: 86% tows observed	2018/19: 79% tows observed
Seabirds		2016/17: 4 observed captures; 6 estimated	2017/18: 10 observed captures; 11 estimated	2018/19: 3 observed captures
Marine mammals	NZ fur seal	2016/17: 0 observed captures	2017/18: 3 observed captures	2018/19: 0 observed captures
	Common dolphin	2016/17: 0 observed captures	2017/18: 1 observed capture	2018/19: 0 observed captures
Benthic interactions (fishable area trawled)		2017/18: 2,899 km^2 (0.2%)	2007/08 – 2017/18: 22,201 km^2 (1.6%)	

Economic indicators (calendar year)	
Quota value 2018	$NZ 76.2 m (includes JMA 1 holdings)
Export earnings 2019	$NZ 72.5 m FOB (for all stocks)

LING (TIER 1) LIN

2018/19 Landings, Catch limits and Allowances (tonnes)						
Stock	**2017/18 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
LIN 3	2,016	2,060	2,060	0	0	0
LIN 4	2,044	4,200	4,200	0	0	0
LIN 5	4,593	4,834	4,735	1	1	97
LIN 6	3,706	8,590	8,505	0	0	85
LIN 7	3,058	3,144	3,080	1	1	62

Reference points and current status			
Target	40% B_0	LIN 3 & 4	B_{2019} estimated to be 57% B_0. 'Very Likely' (>90%) to be above the target
		LIN 5 & 6[103]	B_{2018} estimated to be 75%-101% B_0. 'Virtually Certain' (>99%) to be above the target
		LIN 6B[104]	B_{2006} estimated to be 61% B_0. 'Very Likely' (>90%) to be at or above the target.
		LIN 7[105]	B_{2017} estimated to be 54%-79% B_0. 'Very Likely' (>90%) to be at or above the target.
		LIN CS[106]	B_{2010} estimated to be 54% B_0. 'Likely' (>60%) to be at or above the target
Soft limit	20% *B0*	LIN 3 & 4	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		LIN 5 & 6	B_{2018} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		LIN 6B	B_{2006} 'Very Unlikely' (<10%) to be below the soft limit
		LIN 7	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		LIN CS	B_{2010} 'Exceptionally Unlikely' (<1%) to be below the soft limit
Hard limit	10% B_0	LIN 3 & 4	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		LIN 5 & 6	B_{2018} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		LIN 6B	B_{2006} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		LIN 7	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		LIN CS	B_{2010} 'Exceptionally Unlikely' (<1%) to be below the soft limit

2018/19 Deemed value rates (per kg) and charges					
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**			**2017/18 Actual**
		100-102%	**102-120%**	**Annual 120%+**	
LIN 3 LIN 4 LIN 5 LIN 6	$1.20	$2.38	$3.40	$6.00	$419 $0 $127 $0
LIN 4[107]	$0.56	$1.12			$0
LIN 7	$2.14	$2.38			$439

Environmental indicators and observer coverage (LIN 3 – LIN 7 only)				
Observer coverage	Trawl (>28 m)	2016/17: 36% tows observed	2017/18: 51% tows observed	2018/19: 38% tows observed
	Longline	2016/17 16% hooks observed	2017/18: 27% hooks observed	2018/19: 11% hooks observed
Seabirds	Trawl (>28 m)	2016/17: 15 observed captures; 34 estimated	2017/18: 14 observed captures; 33 estimated	2018/19: 5 observed captures
	Longline	2016/17: 31 observed captures; 583 estimated	2017/18: 23 observed captures; 335 estimated	2018/19: 18 observed captures
NZ fur seals	Trawl (>28 m)	2016/17: 2 observed captures	2017/18: 1 observed capture	2018/19: 1 observed capture
	Longline	2016/17: 1 observed capture.	2017/18: 0 observed captures	2018/19: 0 observed captures

[103] Excluding the Bounty Plateau.

[104] Bounty Plateau.

[105] Excluding Cook Strait.

[106] Cook Strait.

[107] Chatham Island resident fishers landing to Chatham Island Licenced Fish Receivers.

Benthic interactions (fishable area trawled)	2017/18: 1,536 km^2 (0.1%)	2007/08 – 2016/17: 14,068 km^2 (1.0%)
Economic indicators (calendar year)		
Quota value 2018	$NZ 529.4 m (includes LIN 1 & LIN 2 holdings)	
Export earnings 2019	$NZ 72.5 m FOB	

LOOKDOWN DORY (TIER 2) LDO

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
LDO 1	133	168	168	0	0	0
LDO 3	287	614	614	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	'Unlikely' (<40%) to be below the hard limit

2018/19 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual rate for catch in excess of ACE**	**2018/19 Actual**
LDO 1	$0.38	$0.42	$0
LDO 3	$0.21		$0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 156 km^2 (<0.1%)	2007/08 – 2017/18: 990 km^2 (0.1%)
Economic indicators (calendar year)		
Quota value 2018	$NZ 2.0 m	
Export earnings 2019	This species is not individually listed in export statistics	

OREO (TIER 1) OEO

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
OEO 1	689	2,500	2,500	0	0	0
OEO 3A	3,365	3,518	3,350	0	0	168
OEO 4	3,283	3,780	3,600	0	0	180
OEO 6	1,613	-	6,000	-	-	-

Reference points and current status (as per Harvest Strategy Standard defaults)				
Target	40% B_0	OEO 1 Southland	SSO	B_{2007} estimated to be 27% B_0. 'Unlikely'(<40%) to be at or above the target
		OEO 3A	BOE	Unknown
			SSO	B_{2009} estimated to be 36% B_0. 'About as Likely as Not' (40-60%) to be at or above the target
		OEO 4	BOE	Unknown
			SSO	B_{2018} estimated to be 40% B_0. 'About as Likely as Not' (40-60%) to be at or above the target
		OEO 6 Pukaki rise	BOE	Unknown
			SSO	Unknown
		OEO 6 Bounty Plateau	SSO	B_{2008} estimated to be 33% B_0. 'Unlikely'(<40%) to be at or above the target
Soft Limit	20% B_0	OEO 1 Southland	SSO	B_{2007} is 'Unlikely' (<40%) to be below the soft limit
		OEO 3A	BOE	Unknown
			SSO	B_{2009} is 'Unlikely' (<40%) to be below the soft limit
		OEO 4	BOE	Unknown
			SSO	B_{2018} is 'Very Unlikely' (<10%) to be below the soft limit
		OEO 6 Pukaki rise	BOE	Unknown
			SSO	Unknown
		OEO 6 Bounty Plateau	SSO	B_{2008} is 'Unlikely' (<40%) to be below the soft limit
Hard Limit	10% B_0	OEO 1 Southland	SSO	B_{2007} is 'Very Unlikely' (<10%) to be below the hard limit
		OEO 3A	BOE	Unknown
			SSO	B_{2009} is 'Very Unlikely' (<10%) to be below the hard limit
		OEO 4	BOE	Unknown
			SSO	B_{2018} is 'Exceptionally Unlikely' (<1%) to be below the hard limit
		OEO 6 Pukaki rise	BOE	Unknown
			SSO	Unknown
		OEO 6 Bounty Plateau	SSO	B_{2008} is 'Very Unlikely' (<10%) to be below the hard limit

2018/19 Deemed value rates (per kg) and charges								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
OEO 1 OEO 6	$0.39	$0.78	$0.94	$1.09	$1.25	$1.40	$1.56	$0 $0
OEO 3A	$0.38	$0.76	$0.91	$1.06	$1.22	$1.37	$1.52	$1
OEO 4	$0.82	$0.90	$1.08	$1.26	$1.44	$1.62	$1.80	$0

Environmental indicators and observer coverage				
Observer coverage		2016/17: 51% tows observed	2017/18: 41% tows observed	2018/19: 54% tows observed
Seabirds		2016/17: 0 observed captures; 2 estimated	2017/18: 2 observed captures; 4 estimated	2018/19: 1 observed capture
Marine mammals	NZ fur seal	2016/17: 0 observed captures	2017/18: 0 observed captures	2018/19: 1 observed capture
Benthic interactions (fishable area trawled)		2017/18: 386 km^2 (<0.1%)		2007/08 – 2017/18: 4,882 km^2 (0.4%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 84.3 m (includes all species)
Export earnings 2019	Black oreo - $NZ 3.6 m FOB Smooth oreo - $NZ 2.9 m FOB Oreo, other - $NZ 8.3 m FOB (this category includes black and/or smooth oreo that has not been reported by individual species)

CATCH SPLIT

OEO 1

Area	Catch limit for 2018/19 (t)	Industry reported catch (t)	Sum of catch reported via ERS (t)
Southland (*smooth oreo only*)	400	41	113
Southland (*black & spiky oreo only*)	N/A	27	38
OEO 1 excluding Southland (*all species*)	N/A	621	475
OEO 1 (*all species*)	2,500	689	626

OEO 3A

Species	Catch limit (t)	Industry reported catch (t)	Sum of estimated catch reported via ERS (t)
Black oreo *(includes spiky oreo)*	1,700	1,605	1,787
Smooth oreo	1,650	1,759	1,519
Totals	3,350	3,364	3,307

OEO 4

Species	Catch limit (t)	Industry reported catch (t)	Sum of estimated catch reported via ERS (t)
Smooth oreo	2,600	2,549	2,478
Black oreo *(includes spiky and warty oreo)*	N/A	735	713
OEO 4 *(all species)*	3,600	3,283	3,191

ORANGE ROUGHY (TIER 1) ORH

2018/19 Landings, catch limits, and allowances (tonnes)						
Stock	**2018/19 Catch**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
ORH 1	5,921	1,470	1,400	-	-	70
ORH 2A	491	512	488	-	-	24
ORH 2B	60	63	60	-	-	3
ORH 3A	129	186	177	-	-	9
ORH 3B	5,157	6,413	6,091	-	5	317
ORH 7A	1,589	1,680	1,600	-	-	80
ORH 7B	1	1	1	-	-	-

Reference points and current status			
Target	30-40% B_0	ORH 1	Unknown
	30% B_0	ORH 2A (North)	B_{2003} estimated to be 24% B_0. 'Unlikely'(<40%) to be at or above the target
	30-40% B_0	ORH 2A (South), 2B & 3A[108]	B_{2014} estimated to be 14% B_0. 'Very Unlikely' (<10%) to be at or above the lower end of the target range.
	30-50% B_0	ORH 3B NW Chatham Rise	B_{2017} estimated to be 38% B_0. 'Very Likely' (>90%) to be at or above the lower end of the target range.
		ORH 3B E&S Chatham Rise	B_{2017} estimated to be 33% B_0. 'Likely' (>60%) to be at or above the lower end of the target range.
		ORH 3B Puysegur	B_{2017} estimated to be 49% B_0. 'Very Likely' (>90%) to be at or above the lower end of the target range.
	30-40% B_0	ORH 7A[109]	B_{2019} estimated to be 47% B_0. 'Very Likely' (>90%) to be at or above the lower end of the target range and 'About as Likely as Not' (40-60%) to be at or above the upper end of the target range.
	30% B_0	ORH 7B	B_{2004} estimated to be 17% B_0. 'Very Unlikely' (<10%) to be at or above the target.
Soft limit	20% B_0	ORH 1	Unknown
		ORH 2A (North)	B_{2003} 'Unlikely' (<40%) to be below the soft limit
		ORH 2A (South), 2B & 3A	B_{2014} 'Likely' (>60%) to be below the soft limit
		ORH 3B NW Chatham Rise	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		ORH 3B E&S Chatham Rise	B_{2017} 'Very Unlikely' (<10%) to be below the soft limit
		ORH 3B Puysegur	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		ORH 7A	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		ORH 7B	B_{2004} 'Likely' (>60%) to be below the soft limit
Hard limit	10% B_0	ORH 1	Unknown
		ORH 2A (North)	B_{2003} 'Very Unlikely' (<40%) to be below the hard limit
		ORH 2A (South), 2B & 3A	B_{2014} 'Unlikely' (<40%) to be below the hard limit
		ORH 3B NW Chatham Rise	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		ORH 3B E&S Chatham Rise	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		ORH 3B Puysegur	B_{2017} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		ORH 7A	B_{2019} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		ORH 7B	B_{2004} 'Unlikely' (<40%) to be below the hard limit

Harvest strategy	
Harvest Control Rule for: ORH 3B NW Chatham Rise, ORH 3B E&S Chatham Rise &	Based on an F_{mid} of 4.5%. This is increased slightly above the midpoint of the target range and decreased slightly below the midpoint. If a stock is below the target range,

[108] Collectively known as the Mid-East Coast stock (MEC).

[109] Includes the Westpac Bank.

ORH 7A		*F* is decreased more substantially and the subsequent *F* is also rescaled to ensure that biomass returns to the target range.						
Exploitation rate (*F*): All other stocks		4.5% of current biomass if in target range. *F* is reduced if biomass is below the target range						
2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-110%			**110%+**			
ORH 1	$1.70	$3.40			$5.00			$0
Stock	**Interim rate**	**100-120%**	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	**2018/19 Actual**
ORH 2A	$2.50	$5.00	$6.00	$7.00	$8.00	$9.00	$10.00	$0
ORH 2B								$0
ORH 3A								$0
Stock	**Interim rate**	**100-110%**			**110%+**			**2018/19 Actual**
ORH 3B	$2.50	$5.00			$6.25			$0
ORH 7A								$5
ORH 7B	$1.60	$3.20			$5.00			$160
Environmental indicators and observer coverage								
Observer coverage		2016/17: 27% tows observed			2017/18: 20% tows observed			2018/19: 25% tows observed
Seabirds		2016/17: 2 observed captures; 10 estimated			2017/18: 2 observed captures; 11 estimated			2018/19: 3 observed captures
Marine mammals	NZ fur seal	2016/17: 0 observed captures			2017/18: 0 observed captures			2018/19: 0 observed captures
Benthic impacts (fishable area trawled)		2017/18: 756 km^2 (0.1%)			2007/08 – 2016/17: 5,323 km^2 (0.4%)			
Economic indicators (calendar year)								
Quota value 2018		$NZ 295.8 m						
Export earnings 2019		$NZ 57.2 m FOB (includes catch from outside the EEZ)						

Table 39: 2018/19 sub-area catch limits and estimated catch for orange roughy stocks (tonnes).

Stock	Sub-area	Agreed catch limit	Industry reported catch	2018/19 Catch (reported via ERS)
ORH 1[110]	Area A	530	138	132
	Area B	530	389	426
	Area C	470	11	0
	Area D	470 (incl. 30 t bycatch limit in the MC Box)	24	19
ORH 2A	ORH 2A North	200	208	194
	ORH 2A South	288	283	300
ORH 3B	NW Chatham Rise	1,150	294	263
	E&S Chatham Rise	4,095	4,143	3,754
	Puysegur	347	334	253
	Sub-Antarctic	500	385	365

[110] The sum of the catch limits applying to each sub-area is greater than the overall TACC of 1,400 tonnes. This means the catch limit cannot be reached in all sub-areas in a given year.

PALE GHOST SHARK (TIER 2) GSP

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
GSP 1	515	1,208	1,150	0	0	58
GSP 5	305	477	454	0	0	23
GSP 7	21	176	176	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	GSP 1 & GSP 5	'Unlikely' (<40%) to be below soft limit
		GSP 7	Unknown
Hard Limit	10% B_0	GSP 1 & GSP 5	'Very Unlikely' (<10%) to be below hard limit
		GSP 7	Unknown

2018/19 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**	**2018/19 Actual**
		100%+	
GSP 1 GSP 5	$0.08	$0.15	$0 $0
GSP 7	$0.17	$0.34	$0

Economic indicators (calendar year)	
Quota value 2018	$NZ 2.5 m
Export earnings 2019	$NZ 0.6 m FOB (includes both pale and dark ghost shark, Export statistics are not provided for individual ghost shark species)

PATAGONIAN TOOTHFISH (TIER 2) PTO

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
PTO 1	<1	50	49.5	0	0	0.5

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	PTO 1	Unknown
Soft Limit	20% B_0	PTO 1	Unknown
Hard Limit	10% B_0	PTO 1	Unknown

2018/19 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2018/19 Actual**
		100-110%	**110%+**	
PTO 1	$13.50	$15.00	$25.00	$0

Economic indicators (calendar year)	
Quota value 2018	Not available
Export earnings 2019	$NZ 0.4 m FOB[111]

[111] Most revenue generated by Patagonian toothfish was likely taken in other jurisdictions but landed in New Zealand.

PRAWN KILLER (TIER 2) PRK

2018/19 Landings, Catch limits and Allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
PRK 1	<1	25.7	24.5	0	0	1.2
PRK 2	<1	3.7	3.5	0	0	0.2
PRK 3	0	1	1	0	0	0
PRK 4A	<1	1	1	0	0	0
PRK 5	0	1	1	0	0	0
PRK 6A	0	1	1	0	0	0
PRK 6B	0	1	1	0	0	0
PRK 7	<1	1	1	0	0	0
PRK 8	0	1	1	0	0	0
PRK 9	<1	1	1	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual differential rate for excess catch[112]**	**2018/19 Actual**
PRK 1	$0.10	$0.20	$0
PRK 2			$0
PRK 3			$0
PRK 4A			$0
PRK 5			$0
PRK 6A			$0
PRK 6B			$0
PRK 7			$0
PRK 8			$0
PRK 9			$2

Economic indicators (calendar year)	
Quota value 2018	Not available
Export earnings 2019	Prawn killer does not feature as an individual species in export statistics

[112] Differential deemed value rates do not apply to prawn killer stocks.

REDBAIT (TIER 2) RBT

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RBT 1	<1	20	19	0	0	1
RBT 3	2,648	2,305	2,190	0	0	115
RBT 7	26	2,991	2,841	0	0	150

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
RBT 1 RBT 7	$0.25	$0.50	$0.60	$0.70	$0.80	$0.90	$1.00	$13 $0
RBT 3	$0.45							$133,413

Environmental indicators		
Benthic impacts (fishable area trawled)	2017/18: 13 km^2 (<0.1%)	2007/08 – 2017/18: 408 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	NZ$ 9.5 m
Export earnings 2019	Redbait does not feature as an individual species in export statistics

RIBALDO (TIER 2) RIB

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RIB 3	358	394	394	0	0	0
RIB 4	199	357	357	0	0	0
RIB 5	36	52	52	0	0	0
RIB 6	113	231	231	0	0	0
RIB 7	151	330	330	0	0	0
RIB 8	<1	1	1	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	RIB 3 & 4	Unknown
		RIB 5 & 6	Unknown
		RIB 7 & 8	Unknown
Soft Limit	20% B_0	RIB 3 & 4	Unlikely (<40%) to be below soft limit
		RIB 5 & 6	Unlikely (<40%) to be below soft limit
		RIB 7 & 8	Unknown
Hard Limit	10% B_0	RIB 3 & 4	Unlikely (<40%) to be below hard limit
		RIB 5 & 6	Unlikely (<40%) to be below hard limit
		RIB 7 & 8	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	**2018/19 Actual**
RIB 3	$0.15	$0.30	$0.36	$0.42	$0.48	$0.54	$0.60	$2
RIB 5								$0
RIB 4	$0.27							$0
RIB 8								$0
RIB 6	$0.40	$0.80	$0.96	$1.12	$1.28	$1.44	$1.60	$0
Stock	**Interim rate**	**100-110%**		**110-120%**		**120%+**		**2018/19 Actual**
RIB 7	$0.72	$0.80		$1.20		$2.50		$0

Environmental indicators		
Benthic impacts (fishable area trawled)	2017/18: 6 km^2 (<0.1%)	2007/08 – 2017/18: 6 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 6.6 m (includes RIB 1, RIB 2 & RIB 9 holdings)
Export earnings 2019	No export information specific to ribaldo is currently available

RUBYFISH (TIER 2) RBY

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RBY1	47	318	300	1	2	15
RBY2	141	435	433	1	1	0
RBY3	3	32	30	0	0	2
RBY4	16	19	18	0	0	1
RBY5	<1	0	0	0	0	0
RBY6	<1	0	0	0	0	0
RBY7	16	33	33	0	0	0
RBY8	<1	6	6	0	0	0
RBY9	2	19	19	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
RBY 1	$0.25	$0.28	$0.34	$0.39	$0.45	$0.50	$0.56	$0
RBY 2								$0
RBY 3								$0
RBY 4								$0
RBY 5								$86
RBY 6								$0
RBY 8								$12
RBY 9								$0
Stock	**Interim rate**	**100%+**						**2018/19 Actual**
RBY 7	$0.38	$0.42						$0

Environmental indicators		
Benthic impacts (fishable area trawled)	2017/18: 108 km^2 (<0.1%)	2007/08 – 2017/18: 887 km^2 (0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 1.4 m
Export earnings 2019	Rubyfish does not feature as an individual species in export statistics

SCAMPI (TIER 1) SCI

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SCI 1	119	126	120	0	0	6
SCI 2	157	161	153	0	0	8
SCI 3	413	428	408	0	0	20
SCI 4A	122	126	120	0	0	6
SCI 5	<1	42	40	0	0	2
SCI 6A	257	321	306	0	0	15
SCI 6B	0	53	50	0	0	3
SCI 7	1	79	75	0	0	4
SCI 8	0	5	5	0	0	0
SCI 9	<1	37	35	0	0	2

Reference Points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	SCI 1	B_{2015} estimated to be 75% B_0. 'Very Likely' (>90%) to be at or above the target
		SCI 2	B_{2015} estimated to be 89-113% B_0. 'Very Likely' (>90%) to be at or above the target
		SCI 3	B_{2017} estimated to be 76% B_0. 'Very Likely' (>90%) to be at or above the target
		SCI 6A	B_{2016} estimated to be 67-72% B_0 'Very Likely' (>90%) to be at or above the target
		All other stocks	Unknown
Soft Limit	20% B_0	SCI 1	B_{2015} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		SCI 2	B_{2015} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		SCI 3	B_{2017} 'Very Unlikely' to be below the soft limit
		SCI 6A	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		All other stocks	Unknown
Hard Limit	10% B_0	SCI 1	B_{2015} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		SCI 2	B_{2015} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		SCI 3	B_{2017} 'Very Unlikely' to be below the hard limit
		SCI 6A	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		All other stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
All stocks	$25.65	$51.30	$61.56	$71.82	$82.08	$92.34	$102.60	$0 (all stocks)

Environmental indicators and observer coverage				
Observer coverage		2016/17: 10% tows observed	2017/18: 13% tows observed	2018/19: 16% tows observed
Seabirds		2016/17: 11 observed captures; 127 estimated	2017/18: 19 observed captures; 130 estimated	2018/19: 17 observed captures
Marine mammals	NZ fur seal	2016/17: 1 observed capture	2017/18: 0 observed captures	2018/19: 0 observed captures
	NZ sea lion[113]	2016/17: 0 observed captures	2017/18: 2 observed captures	2018/19: 1 observed capture
Benthic interactions (fishable area trawled)		2017/18: 4,535 km^2 (0.3%)	2007/08 – 2017/18: 12,659 km^2 (0.9%)	

Economic Indicators (calendar year)	
Quota value 2018	$NZ 421.4 m
Export earnings 2019	Scampi does not feature as an individual species in export statistics

[113] Figures exclude decomposing carcasses.

SEA PERCH (TIER 2) SPE

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SPE 3	556	1,022	1,000	11	11	0
SPE 4	431	956	910	0	0	46
SPE 5	18	38	36	1	1	0
SPE 6	5	9	9	0	0	0
SPE 7	47	98	82	8	8	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	SPE 3 – SPE 7	Unknown
Soft Limit	20% B_0	SPE 3 – SPE 7	Unknown
Hard Limit	10% B_0	SPE 3 – SPE 7	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
SPE 3 SPE 7	$0.50	$0.55	$0.66	$0.77	$0.88	$0.99	$1.10	$170 $5
SPE 4 SPE 5 SPE 6	$0.36	$0.40	$0.48	$0.56	$0.64	$0.72	$0.80	$0 $35 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 217 km^2 (<0.1%)	2007/08 – 2017/18: 2,271 km^2 (0.2%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 6.7 m (includes SPE 1 & SPE 2 holdings)
Export earnings 2019	$NZ 1.9 m FOB (includes all stocks)

SILVER WAREHOU (TIER 2) SWA

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SWA 1	463	3,003	3,000	2	1	0
SWA 3	3,268	-	3,280	-	-	-
SWA 4	4,876	-	4,090	-	-	-

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	Unknown

2018/19 Deemed value rates (per kg) and invoices					
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**			**2018/19 Actual**
		100-110%	**110-130%**	**130%+**	
SWA 1 SWA 4	$0.50	$1.22	$1.74	$3.00	$0 $1,219,931
SWA 3	$1.57	$1.74	$2.00		$180,231

Environmental indicators and observer coverage			
Observer coverage	2016/17: 70% tows observed	2017/18: 60% tows observed	2081/19: 66% tows observed
Seabirds	2016/17: 7 observed captures	2017/18: 11 observed captures	2018/19: 16 observed captures
NZ fur seal	2016/17: 0 observed captures	2017/18: 0 observed captures	2018/19: 0 observed captures
Benthic interactions (fishable area trawled)	2017/18: 1,816 km^2 (0.1%)	2007/08 – 2017/18: 16,064 km^2 (1.2%)	

Economic indicators (calendar year)	
Quota value 2018	$NZ 171.1 m
Export earnings 2019	$NZ 24.0 m FOB

SOUTHERN BLUE WHITING (TIER 1) SBW

Landings, catch limits and allowances as of 1 April 2019 (tonnes)						
Stock	**2018/19 Landings[114]**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SBW 1	33 (4)	100	98	0	0	2
SBW 6A	218 (87)	1,640	1,640	0	0	0
SBW 6B	1,101 (788	3,209	3,145	0	0	64
SBW 6I	15,147 (26,517)	40,000	39,200	0	0	800
SBW 6R	36 (3,628)	5,500	5,500	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	SBW 1	Unknown
		SBW 6A	Unknown
		SBW 6B	B_{2017}: Likely >60% to be below target F[115]
		SBW 6I	B_{2016} estimated to be 70% B_0. 'Very Likely' (>90%) to be at or above the target
		SBW 6R	Unknown
Soft limit	20% B_0	SBW 1	Unknown
		SBW 6A	Unknown
		SBW 6B	Unknown
		SBW 6I	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the soft limit
		SBW 6R	Unknown
Hard limit	10% B_0	SBW 1	Unknown
		SBW 6A	Unknown
		SBW 6B	Unknown
		SBW 6I	B_{2016} 'Exceptionally Unlikely' (<1%) to be below the hard limit
		SBW 6R	Unknown

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180&**	**180-200%**	**200%+**	
SBW 1	$0.41	$0.46	$0.55	$0.64	$0.74	$0.83	$0.92	$949
Stock		**100-102%**		**102-150%**		**150%+**		**2018/19 Actual**
SBW 6A SBW 6B SBW 6I SBW 6R		$0.46		$0.60		$0.92		$0 $0 $0 $0

Environmental indicators and observer coverage[116]				
Observer coverage		2016/17: 100% tows observed	2017/18: 100% tows observed	2018/19
Seabirds		2016/17: 6 observed captures; 6 estimated	2017/18: 6 observed captures	2018/19: 3 observed caotures,
Marine mammals	NZ fur seals	2016/17: 11 observed capture	2017/18: 17 observed captures	2018/19: 11 observed captures
	NZ sea lion	2016/17: 0 observed captures	2017/18: 2 observed captures	2018/19: 0 observed captures
Benthic interactions (fishable area trawled)		2017/18: 744 km^2 (0.1%)		2007/08 – 2017/18: 9,036 km^2 (0.6%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 172.6 m
Export earnings 2019	$NZ 27.4 m FOB

[114] 2018/19 landings from the 1 April 2018 – 30 March 2019 fishing year. Figures in brackets indicate landings for the 2019 'season' (the 2019/20 fishing year).

[115] *F* refers to a fishing mortality rate calculated using the harvest control rule.

[116] Information on environmental actions is provided by October fishing year e.g. 2018-19 covers 1 October 2018 – 30 September 2019. Given the highly seasonal nature of the fishery, this effectively includes all captures from southern blue whiting target tows during the 2019-20 April fishing year.

SPINY DOGFISH (TIER 2) SPD

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SPD 4	1,147	1,662	1,626	10	10	20
SPD 5	1,098	3,753	3,700	8	8	37

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	SPD 4 & SPD 5	Unknown
Soft Limit	20% B_0	SPD 4 & SPD 5	Unknown
Hard Limit	10% B_0	SPD 4 & SPD 5	Unknown

2018/19 Deemed value rates (per kg) and invoices			
Stock	**Interim**	**Annual rate for catch in excess of ACE[117]**	**2018/19 Actual**
SPD 4 SPD 5	$0.05	$0.10	$39 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 0 km^2	2007/08 – 2017/18: 835 km^2 (<0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 8.4 m (includes SPD 1, SPD 3, SPD 7 & SPD 8 holdings)
Export earnings 2019	$NZ 0.1 m FOB (includes all SPD stocks)

[117] Differential deemed value rates do not apply to spiny dogfish stocks.

SQUID (TIER 1) SQU

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SQU 1J	<1	5,030	5,000	10	10	10
SQU 1T	34,212	44,741	44,741	0	0	0
SQU 6T	9,180	-	32,369	-	-	-

Reference points and current status
Arrow squid live for one year, spawn once then die. No estimates of current and reference biomass are available and there is no proven method available at this time to estimate yields from the squid fishery before the fishing season begins.

2018/19 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2018/19 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
SQU 1J SQU 1T SQU 6T	$0.44	$0.88	$1.056	$1.232	$1.408	$1.584	$1.76	$4 $15 $0

Environmental indicators and observer coverage[118]				
Observer coverage		2016/17: 77% tows observed	2017/18: 94% tows observed	2018/19: 88% tows observed
Seabirds		2016/17: 261 observed captures; 336 estimated	2017/18: 256 observed captures; 276 estimated	2018/19: 347 observed captures
Marine mammals	NZ fur seals	2016/17: 17 observed captures	2017/18: 14 observed captures	2018/19: 25 observed captures
	NZ sea lion	2016/17: 3 observed captures	2017/18: 3 observed captures	2018/19: 7 observed captures
Benthic interactions (fishable area trawled)		2017/18: 3,108 km^2 (0.2%)		2007/08 – 2017/18: 13,963 km^2 (1.0%)

Economic indicators (calendar years)	
Quota value 2018	$NZ 132.4 m
Export earnings 2019	$NZ 247 m FOB

[118] Trawl vessels greater than 28 m in length.

WHITE WAREHOU (TIER 2) WWA

2018/19 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
WWA 1	<1	4	4	0	0	0
WWA 2	5	75	73	1	1	0
WWA 3	211	585	583	1	1	0
WWA 4	91	332	330	1	1	0
WWA 5B	680	2,621	2,617	2	2	0
WWA 7	40	129	127	1	1	0
WWA 8	<1	1	1	0	0	0
WWA 9	<1	0	0	0	0	0

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	All stocks	Unknown
Soft Limit	20% B_0	All stocks	Unknown
Hard Limit	10% B_0	All stocks	Unknown

2017/18 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2018/19 Actual**
		100%+		
WWA 1 WWA 2 WWA 8 WWA 9	$0.27	$0.54		$2 $0 $0 $9
Stock	**Interim rate**	**100-110%**	**110%+**	**2018/19 Actual**
WWA 3 WWA 4 WWA 5B WWA 7	$0.52	$1.03	$2.00	$0 $0 $0 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2017/18: 18 km^2 (<0.1%)	2007/08 – 2017/18: 1,958 km^2 (0.1%)

Economic indicators (calendar year)	
Quota value 2018	$NZ 25.0 m
Export earnings 2019	$NZ 4.9 m FOB[119]

[119] Information in export statistics for "Warehou, Other" is assumed to be white warehou.

Appendix II: Decisions on sustainability measures for the 2018/19 fishing year

TAC REVIEWS

Species	Stock	Pre-1 Oct 2018 TAC (t)	Pre-1 Oct 2018 TACC (t)	1 Oct 2018 TAC (t)	1 Oct 2018 TACC (t)
Ling	LIN 5	4,036	3,955	4,834	4,735
Orange roughy	ORH 3B	5,470	5,197	6,413	6,091
Oreo	OEO 4	3,150	3,000	3,780	3,600
Scampi	SCI 3	357	340	428	408

DEEMED VALUE RATE REVIEW

Species	Stock		Interim deemed value rate $/kg	Standard annual differential rates for excess catch (% of ACE) $/kg					
				100-120%	120-140%	140-160%	160-180%	180-200%	>200%
Gemfish	SKI 3 SKI 7	Pre 1 Oct 2018	0.65	1.29	1.55	1.81	2.06	2.32	2.58
		1 Oct 2018	0.65	0.72	0.86	1.01	1.15	1.30	1.44

Appendix III: Catch of Tier 3 species by the core deepwater fleet (2014/15 – 2018/19)[120]

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
JAV	Javelinfish	*Lepidorhynchus denticulatus*	4,233,558	4,299,703	5,366,017	6,101,957	3,904,519
RAT	Rattails	*Macrouridae* spp.	3,681,747	3,630,495	5,068,584	4,538,703	3,758,456
SDO	Silver dory	*Cyttus novaezealandiae*	230,741	230,383	192,410	295,292	739,095
SND	Shovelnose dogfish	*Deania calcea*	250,659	428,894	376,752	491,923	484,624
OSD	Other sharks and dogfish	Order Selachii	189,100	290,874	268,354	248,357	300,924
ETB	Baxter's lantern dogfish	*Etmopterus baxteri*	289,706	252,780	309,202	325,158	297,344
STU	Slender tuna	*Allothunnus fallai*	234,630	177,288	208,589	627,634	291,404
RHY	Common roughy	*Paratrachichthys trailli*	115,953	66,943	63,535	159,567	236,881
SSI	Silverside	*Argentina elongate*	123,038	133,923	168,808	588,581	218,884
NCB	Smooth red swimming crab	*Nectocarcinus bennetti*	185,908	141,902	491,231	245,122	214,407
CSQ	Leafscale gulper shark	*Centrophorus squamosus*	122,870	177,808	126,796	194,669	161,207
LCH	Long-nosed chimaera	*Harriotta raleighana*	110,550	128,018	137,950	157,373	137,691
SLK	Slickhead	*Alepocephalidae* spp.	106,980	114,798	165,740	191,060	126,785
BEN	Scabbardfish	*Benthodesmus* spp.	44,419	50,394	89,818	132,784	121,930
WSQ	Warty squid	*Onykia* spp.	88,731	83,629	173,382	139,573	117,028
FHD	Deepsea flathead	*Hoplichthys haswelli*	105,271	99,009	99,737	146,791	105,884
BSH	Seal shark	*Dalatias licha*	86,591	80,944	138,535	113,409	99,582
HCO	Hairy conger	*Bassanago hirsutus*	62,825	90,138	79,682	52,687	88,504
YBO	Yellow boarfish	*Pentaceros decacanthus*	8,133	6,340	7,730	15,759	88,144
SFI	Starfish	-	47,871	72,546	69,777	95,790	85,337
HJO	Johnson's cod	*Halargyreus johnsonii*	20,140	34,461	60,923	55,099	72,742
ETL	Lucifer dogfish	*Etmopterus lucifer*	31,899	23,591	36,108	51,618	55,873
BEL	Bellowsfish	*Centriscops* spp.	53,040	55,510	105,659	70,883	53,698
DWD	Deepwater dogfish	-	68,246	70,470	70,599	78,880	46,241
NSD	Northern spiny dogfish	*Squalus griffin*	49,714	26,851	29,405	27,078	44,554
OPE	Orange perch	*Lepidoperca aurantia*	10,489	23,606	15,001	13,267	41,947
BBE	Banded bellowsfish	*Centriscops humerosus*	38,848	30,762	19,397	80,948	40,818
CRB	Crab (unspecified)	-	36,770	79,893	56,969	68,321	38,835

[120] Includes catch from outside the New Zealand EEZ.

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
SRH	Silver roughy	*Hoplostethus mediterraneus*	62,776	24,537	32,653	48,633	38,785
RUD	Rudderfish	*Centrolophus niger*	56,702	56,890	46,272	38,736	38,584
CAR	Carpet shark	*Cephaloscyllium isabellum*	59,859	26,390	47,759	32,448	36,901
CDO	Capro dory	*Capromimus abbreviatus*	58,345	34,028	28,096	47,695	31,334
CYP	Longnose velvet dogfish	*Centroscymnus crepidater*	10,282	20,410	25,632	33,895	31,319
THR	Thresher shark	*Alopias vulpinus*	30,725	23,158	31,524	33,579	30,930
DWE	Deepwater eel (unspecified)	-	16,496	21,980	39,523	55,298	30,812
POP	Porcupine fish	*Tragulichthys jaculiferus*	30,885	25,819	31,053	27,543	27,849
TOA	Toadfish	*Neophrynichthys* spp.	28,421	14,283	26,795	32,451	27,405
LAN	Lanternfish	*Myctophidae* spp.	3,359	6,505	5,865	13,579	23,840
SUN	Sunfish	*Mola mola*	19,599	12,753	12,326	27,321	22,907
MOD	Morids	*Moridae* spp.	62,179	63,278	98,793	53,104	22,725
SBO	Southern boarfish	*Pseudopentaceros richardsoni*	11,035	7,045	23,922	18,235	22,325
PLS	Plunket's shark	*Centroscymnus plunketi*	8,746	9,964	15,562	16,215	20,951
MDO	Mirror dory	*Zenopsis nebulosa*	8,947	5,397	6,918	3,524	20,459
EEL	Eels, Marine (unspecified)	-	247	1,160	52	844	19,336
WIT	Witch	*Arnoglossus scapha*	15,353	17,667	17,432	20,593	18,651
CBE	Crested bellowsfish	*Notopogon lilliei*	36,060	32,724	25,243	9,604	18,641
SCO	Swollenhead conger	*Bassanago bulbiceps*	8,761	28,655	26,188	15,480	18,046
SCD	Smallscaled cod	*Paranotothenia microlepidota*	141	327	311	1,514	17,709
CON	Conger eel	Family Congridae	106,921	41,306	42,406	63,308	17,272
DEA	Dealfish	*Trachipterus trachypterus*	3,285	2,510	5,956	7,237	16,085
SCG	Scaly gurnard	*Lepidotrigla brachyoptera*	13,797	7,196	8,479	6,358	13,440
BEE	Basketwork eel	*Diastobranchus capensis*	12,531	22,296	24,158	29,746	13,190
OCT	Octopus	*Pinnoctopus cylindrica*	9,148	4,582	19,086	9,865	13,142
BCD	Black cod	*Paranotothenia magellanica*	9,782	37,037	77,722	55,895	12,238
JGU	Japanese gurnard	*Pterygotrigla picta*	4,220	6,667	4,415	1,419	11,644
SSH	Slender smooth-hound	*Gollum attenuates*	20,194	27,998	12,722	15,967	10,717
SBK	Spineback	*Notacanthus sexpinis*	19,313	8,665	5,792	14,103	10,702
ERA	Electric ray	*Torpedo fairchildi*	14,589	7,724	9,722	7,127	10,167
PIG	Pigfish	*Congiopodus leucopaecilus*	7,443	12,915	16,721	20,691	9,958

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
UNI	Unidentified fish	-	2,048	4,872	1,658	4,177	9,263
GON	Sandfish	*Gonorynchus* spp.	13,406	4,398	5,653	4,501	8,765
HAG	Hagfish	*Eptatretus cirrhatus*	6,709	9,547	19,187	8,954	8,434
OPI	Umbrella octopus	*Opisthoteuthis* spp.	8,199	7,273	6,540	7,776	8,396
TOP	Pale toadfish	*Neophrynichthys angustus*	4,053	4,545	4,267	5,297	8,261
HEX	Sixgill shark	*Hexanchus griseus*	4,595	8,842	7,592	6,361	7,846
JFI	Jellyfish (unspecified)	-	4,084	270	14,899	2,637	7,120
ALB	Albacore tuna	*Thunnus alalunga*	22,283	3,890	2,689	29,590	6,935
MAN	Finless flounder	*Neoachiropsetta milfordi*	1,134	575	1,925	7,372	6,687
SQX	Squid (unspecified)	-	1,111	1,666	4,231	6,950	6,347
TSQ	*Todarodes filippovae*	*Todarodes filippovae*	5,645	6,802	7,709	11,644	5,938
VSQ	Violet squid	*Histioteuthis* spp.	3,993	4,810	7,297	3,607	5,015
OSK	Skate, other	Family Rajidae	13,195	7,590	3,815	7,717	4,783
WHX	Unicorn rattail	*Trachyrincus* sp.	25,646	8,651	18,045	10,252	4,691
EPL	Cardinal fish, bigeye	*Epigonus lenimen*	5,143	3,964	6,789	5,784	4,616
PAH	Opah	*Lampris immaculatus*	9,986	2,067	7,004	7,302	4,164
PDG	Prickly dogfish	*Oxynotus bruniensis*	5,456	2,103	2,744	4,033	3,842
CUC	Cucumber fish	*Chlorophthalmus nigripinnis*	2,194	1,685	429	3,853	3,822
TRS	Cape scorpionfish	*Trachyscorpia capensis*	303	197	1,779	1,498	3,729
HSI	Jack-knife prawn	*Haliporoides sibogae*	376	255	-	150	3,670
WRA	Whiptail ray	*Dasyatis thetidis*	1,025	974	2,831	435	3,503
BSL	Black slickhead	*Xenodermichthys* spp.	2,575	1,920	3,552	9,121	3,391
CHI	Chimaera spp.	*Chimaeras pp.*	1,255	8,044	6,565	11,740	3,282
YCO	Yellow cod	*Parapercis gilliesi*	1,001	521	969	2,045	3,158
OPA	Opalfish	*Hemerocoetes* spp.	11,736	7,607	15,001	2,789	3,150
SEV	Broadnose sevengill shark	*Notorynchus cepedianus*	2,225	2,025	2,255	1,491	3,145
EGR	Eagle ray	*Myliobatis tenuicaudatus*	625	992	2,619	1,748	3,038
CHG	Purple chimaera	*Chimaera lignaria*	1,847	5,287	12,082	9.750	2,623
MOB	Blunthead lightfish	*Margrethia obtusirostra*	-	4,590	-	-	2,451
URO	Sea urchin, other (except SUR)	-	1,802	401	1,231	3,302	2,300
SKJ	Skipjack tuna	*Katsuwonus pelamis*	1,933	30	92	62	2,264

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
CYO	Smooth skin dogfish	*Centroscymnus owstoni*	3,373	7,773	4,299	7,602	2,063
CHP	Chimaera, purple	*Chimaera* sp.	325	559	815	245	2,032
DSK	Deepwater spiny skate	*Amblyraja hyperborean*	1,793	592	3,445	6,391	1,887
PHO	Lighthouse fish	*Photichthys argenteus*	318	1,102	1,493	785	1,881
BRZ	Brown stargazer	*Xenocephalus armatus*	159	319	992	1,402	1,808
GSQ	Giant squid	*Architeuthis* sp.	1,479	1,475	3,118	2,134	1,684
PRA	Prawn (unspecified)	-	1,822	406	662	2,758	1,580
EUC	Eucla cod	*Euclicthys polynemus*	546	3,602	1,567	2,845	1,378
BWH	Bronze whaler shark	*Carcharhinus brachyurus*	200	268	844	300	1,375
SBR	Southern bastard cod	*Pseudophycis barbata*	2,577	918	1,177	944	1,354
APR	Cat shark	*Apristurus* spp.	2,461	62	153	295	1,342
PSK	Longnosed deepsea skate	*Bathyraja shuntovi*	495	-	-	479	1,293
LCO	Dwarf swimming crab	*Liocarcinus corrugatus*	-	-	-	-	1,197
FMA	*Fusitriton magellanicus*	*Fusitriton magellanicus*	618	499	2,803	267	1,097
OFH	Oilfish	*Ruvettus pretiosus*	554	202	449	629	999
WHE	Whelks	-	480	361	176	487	996
RAY	Rays	-	441	25	299	7	927
BSP	Big-scale pomfret	*Taractichthys longipinnis*	1,528	1,388	718	1,432	849
RCH	Widenosed chimaera	*Rhinochimaera pacifica*	135	12	691	661	845
TAM	Tam O'Shanter urchins	Echinothuriidae and Phoromosomatidae (Families)	1,479	1,214	1,348	323	839
SAL	Salps	-	13,553	23,057	9,173	2,091	747
SSF	Shortbill spearfish	*Tetrapturus angustirostris*	-	-	-	1,630	635
EPR	Cardinal fish, robust	*Epigonus robustus*	438	4	267	446	542
HEP	Sharpnose sevengill shark	*Heptranchias perlo*	902	218	478	685	539
CUB	Cubeheads	*Cubiceps* spp.	38	523	388	61	482
HHS	Hammerhead shark	*Sphyrna zygaena*	-	-	-	-	469
DCS	Dawson's cat shark	*Halaelurus dawsoni*	211	165	493	931	465
LFB	Long-finned boarfish	*Zanclistius elevatus*	10	14	824	120	465
SMC	Small-headed cod	*Lepidion microcephalus*	1,488	567	344	1,233	441
ARN	Paper nautilus	*Argonauta nodosa*	-	-	-	-	434

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
AGR	Ribbonfish	*Agrostichthys parkeri*	332	390	122	142	427
DWO	Deepwater octopus	*Graneledone* spp.	5,473	868	784	421	414
COT	Bonyskull toadfish	*Cottunculus nudus*	-	-	-	8	378
SFN	Spinyfin	*Diretmichthys parini*	9	-	-	197	354
RDO	Rosy dory	*Cyttopsis rosea*	64	94	728	59	312
MNI	Krill, squat lobsters	*Munida* spp.	-	-	8	244	285
SNI	Snipefish	*Macroramphosus scolopax*	89	247	84	791	270
TOD	Dark toadfish	*Neophrynichthys latus*	82	324	182	75	264
PAG	Pagurid	Paguroidea (Family)	1	6	76	102	259
HTH	Sea cucumber (other than *Stichopus mollis*)	Holothuroidea (Class)	336	747	860	1,721	249
LEG	Giant lepidion	*Lepidion schmidti, L. inosimae*	222	487	347	134	243
PLZ	Scaly stargazer	*Pleuroscopus pseudodorsalis*	717	125	78	646	240
BOA	Sowfish	*Paristiopterus labiosus*	12	9	390	88	238
GRC	Grenadier cod	*Tripterophycis gilchristi*	136	2,542	2	1	218
SSM	Smallscaled brown slickhead	*Alepocephalus antipodianus*	241	206	144	-	212
LSK	Long-tailed skate	*Arhynchobatis asperrimus*	196	657	41	149	193
BRA	Short-tailed black ray	*Dasyatis brevicaudata*	308	87	347	812	187
TUB	Tasmanian ruffe	*Tubbia tasmanica*	-	-	-	94	156
BCA	Barracudina	*Magnisudis prionosa*	150	139	148	40	139
VCO	Violet cod	*Antimora rostrata*	40	2,387	1,114	6,579	131
SPZ	Spotted stargazer	*Genyagnus monopterygius*	189	5	50	-	130
SDI	*Stermoptyx diaphana*	*Stermoptyx diaphana*	-	-	-	-	129
GVO	Golden volute	*Provocator mirabilis*	12	-	8	53	123
LCA	Unicornfish	*Lophotus capellei*	-	-	-	-	117
GPF	Girdled wrasse	*Notolabrus cinctus*	84	80	46	48	116
API	Alert pigfish	*Alertichthys blacki*	162	129	63	291	110
BAT	Slickheads	Alepocephalidae (Family)	-	-	-	800	100
TIS[121]	Tiger shark	*Galeocerdo cuvier*	-	-	-	-	100

[121] Caught outside the New Zealand EEZ.

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
SPI	Spider crabs (unspecified)	-	101	72	34	93	96
MOR	Moray eel	*Muraenidae* spp.	11	6	-	-	91
RAG	Ragfish	*Icichthys australis*	147	28	20	79	83
TIN	Tinselfish	*Xenolepidichthys dalgleishi*	41	4	-	7	80
BRC	Northern bastard cod	*Pseudophycis breviuscula*	5	65	70	1	80
AER	Aeneator recens	*Aeneator recens*	-	2	-	-	70
CHX	Pink frogmouth	*Chaunax pictus*	243	18	65	13	55
DAP	Antlered Crab	*Dagnaudus petterdi*	-	-	-	325	46
HYP	Pointynose blue ghost shark	*Hydrolagus trolli*	151	75	97	358	44
RSQ	*Ommastrephes bartrami*	*Ommastrephes bartrami*	80	39	565	315	43
BMA	Blue maomao	*Scorpis violacea*	-	-	-	-	40
DSP	Deepsea pigfish	*Congiopodus coriaceus*	79	30	448	3,884	37
PSY	Blobfish	*Psychrolutes marcidus*	-	-	-	138	37
CPD	*Centrolophidae*	*Centrolophidae*	-	-	-	-	37
SIW	Siphon whelk	*Penion cuvierianus/ sulcatus*	-	-	-	14	31
RSC	Red Scorpion fish	*Scorpaena papilosus*	-	-	-	-	30
AFO	Royal red prawn	*Aristaeomorpha foliacea*	-	-	-	26	30
STR	Stingray (unspecified)	-	156	281	415	90	24
BAC	Codheaded rattail	*Bathygadus cottoides*	-	6	6	-	20
EGA	Euciroa galatheae	*Euciroa galatheae*	-	-	-	-	20
FAN	Fanfish	*Pterycombus petersii*	-	-	-	8	19
TRA	Roughies	Family Trachichthyidae	-	-	17	2	19
LAT	Lancetfish	*Alepisaurus spp*	-	-	-	21	13
OAR	Oarfish	*Regalecus glesne*	68	20	2	70	12
BTR	Brown trout	*Salmo trutta*	-	-	-	-	12
PED	Scarlet prawn	*Aristaeopsis edwardsiana*	-	-	-	-	12
SDF	Spotted flounder	*Azygopus pinnifasciatus*	126	5	20	8	9
CMO	Copper moki	*Latridopsis fosteri*	-	-	-	-	8
CAN	Brown brotula	*Cataetyx niki*	-	-	-	10	8
SPL	*Scopelosaurus sp,*	*Scopelosaurus sp,*	-	-	-	-	8
SNE	Snubnosed eel	*Simenchelys parasitica*	1	-	1	49	8

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
SEE	Silver conger	*Gnathophis habenatus*	-	9	7	6	6
SPF	Scarlet wrasse	*Pseudolabrus miles*	55	26	29	10	5
PAL	Barracudinas	Paralepididae (Family)	9	34	7	8	5
KWH	Knobbed whelk	*Austrofuscus glans*	-	-	-	-	5
RMO	Red moki	*Cheilodactylus spectabilis*	-	-	-	-	5
SEL	Ocean blue-eye	*Schedophilus velaini*	-	-	-	-	4
TET	Squaretail	*Tetragonurus cuvieri*	-	-	-	8	4
SAM	Quinnat salmon	*Omcorhynchus tshawytscha*	4	67	2	-	4
BSQ	Broad squid	*Sepioteuthis australis*	2	3	286	38	3
BAF	Black anglerfish	-	-	-	-	3	3
CHA	Viper fish	*Chauliodus sloani*	70	1	2	-	3
BPE	Butterfly perch	*Caesioperca Lepidoptera*	57	68	117	46	3
WIN	Wingfish	*Pteraclis velifera*	-	-	-	5	2
WLP	Wavy line perch	*Lepidoperca tasmanica*	1	33	-	1	2
PUF	Pufferfish	*Sphoeroides pachygaster*	-	-	-	-	2
SSC	Giant masking crab	*Leptomithrax australis*	10	-	2,077	-	2
NCA	Hairy red swimming crab	*Netocarcinus antarcticus*	-	2	15,184	29	2
LYC	*Lyconus sp*	*Lyconus sp*	-	-	-	-	2
LMI	Masking crabs	*Leptomithrax spp*					2
FRS	Frill shark	*Chlamydoselachus anguineus*	16	-	1	29	2
SDE	Seadevil	*Cryptopsaras couesi*	5	3	3	-	2
TRI	Tripod fish	*Bathyypterois spp*	-	-	-	-	1
MUN	*Munida gregaria*	*Munida gregaria*	-	-	-	-	1
WSE	Wrasses	Labridae (Family)	1	14	18	-	1
SUM	Pelagic butterfish	*Schedophilus maulatus*	-	-	-	-	1
STY	Spotty	*Notolabrus celidotus*	-	-	-	-	1
PER	*Persparsia kopua*	*Persparsia kopua*	-	-	-	-	1
OVM	Swimming crab	*Ovalipes molleri*	-	-	-	-	1
SAU	Saury	*Scomberesox saurus*	-	-	-	2	1
DFI	Dune Lakes galaxias	*Galaxias gracilis*	-	-	-	-	1
BRG	Armless stars	Brisingida (Order)	-	-	-	-	1

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
MST	Scaleless black dragonfishes	Melanostomiidae (Family)	2	-	12	2	1
PMA	Pink maomao	*Caprodon longimanus*	-	-	34	-	1
HYD	*Hydrolagus* spp.	*Hydrolagus* spp.	-	3,275	-	2,136	-
BER	Electric ray	*Typhlonarke* spp.	14,589	1,498	412	1,186	-
ROC	Rock cod	*Lotella rhacina*	3,200	151	8	249	-
BEM	Blue marlin	*Makaira nigricans*	-	-	-	200	-
CYL	Portuguese dogfish	*Centroscymnus coelolepis*	3,959	293	634	114	-
ETP	Smooth lanternshark	*Etmopterus pusillius*	-	-	-	65	-
COD	Cod (unspecified)	-	199	611	44	58	-
MIQ	Warty squid	*Onykia ingens*	363	32	39	56	-
BNO	*Benthoctopus spp*	*Benthoctopus spp*	-	-	-	55	-
MOL	Molluscs (unspecified)	-	-	-	-	55	-
ECN	Echinoid (unspecified)	-	-	-	-	45	-
SYN	Cutthroat eels (except Basketwork eels)	Synaphobranchidae (Family)	108	2	133	33	-
CSH	Cat shark	Other than *Apristurus* spp.	2,461	33	811	30	-
SHE	Sherwood's dogfish	*Scymndalatias sherwoodi*	-	-	-	30	-
BLO	Feeler fish	*Bathypterois longifilis*	-	-	-	20	-
PGR	Plunderfish	*Pogonophryne permitini*	-	30	33	13	-
SHR	Sea hare	Aplysiomorpha (order)	-	-	-	12	-
ABR	Shortsnouted lancetfish	*Alepisaurus brevirostris*	7		19	11	-
SLG	Sea slug	*Scutus breviculus*	-	-	-	9	-
SDR	Spiny seadragon	*Solegnathus spinosissimus*	-	-	-	8	-
SPK	Spikefish	*Macrorhamphosodes uradoi*	-	-	-	8	-
BCR	Blue cusk eel	*Brotulotaenia crassa*	3	1	-	7	-
CAM	Sabre prawn	*Campylonotus rathbunae*	4	-	40	7	-
SBI	Bigscaled brown slickhead	*Alepocephalus australis*	-	-	-	6	-
BRE	Codlet	*Bregmaceros macclellandi*	-	-	-	5	-
SQI	Squirrelfish	*Pristilepis oligolepis*	-	-	-	4	-
DIS	Discfish	*Diretmus argenteus*	8	7	3	2	-
VOL	Volute	Family Volutidae	175	26	38	2	-

Species code	Common name	Scientific name	Catch (kg)				
			2014/15	2015/16	2016 /17	2017/18	2018/19
SLS	Slender sole	*Peltorhampus tenuis*	-	-	-	2	-
BDA	Barracuda	*Sphyraena novaehollandiae*	-	-	-	1	-
FLU	Perch	*Perca fluvitalis*	-	-	-	1	-
SPP	Splendid perch	*Callanthias allporti*	-	7	4	1	-
SHO	Seahorse	*Hippocampus abdominalis*	-	-	-	1	-
CST	Manefish	*Caristius spp*	-	-	-	1	-
CTN	*Calliostoma turnerarum*	*Calliostoma turnerarum*	-	-	-	1	-
LUC	*Luciosudis normani*	*Luciosudis normani*	-	-	-	1	-
GAS	Gastropods	-	-	237	636	-	-
UNX	All and any unidentified species	-	1,020	148	318	-	-
DHO	Deepsea urchin	*Dermechinus horridus*	-	-	2	-	-
FLO	Flounder (unspecified)	-	-	-	2	-	-
PSP	Scissortail	*Psenes pellucidus*	3	7	2	-	-
COL	Olivers rattail	*Coelorinchus oliverianus*	-	-	1	-	-
LEP	Escolar	*Lepidocybium flavobrunneum*	-	-	1	-	-
NTU	Northern bluefin tuna	*Thunnus thynnus*	-	265	-	-	-
MUR	Moray cod	*Muraenolepis marmoratus*	6	50	-	-	-
BPF	Banded wrasse	*Notolabrus fucicola*	-	29	-	-	-
WHR	White rattail	*Trachyrincus longirostris*	621	10	-	-	-
INV	Invertebrate (unknown)	-	-	2	-	-	-
EPD	Cardinal fish, white	*Epigonus denticulatus*	6	1	-	-	-
SLL	Slipper lobsters	*Scyllaridae* spp.	5	1	-	-	-
TAS	Rough pomfret	*Taractes asper*	-	1	-	-	-
MCA	Ridge scaled rattail	*Macrourus carinatus*	2,328	-	-	-	-
GSE	Snake mackerel	*Gempylus serpens*	700	-	-	-	-
LHO	Omega prawn	*Lipkius holthuisi*	4	-	-	-	-
SPT	Purple-heart urchin	*Spatangus multispinus*	1	-	-	-	-
SOP	Pacific sleeper shark	*Somniosus pacificus*	1	-	-	-	-

Appendix IV - Deepwater Fish Plan Advisory Group (FPAG) Terms of Reference 2019

This document outlines the Terms of Reference for the Deepwater Fish Plan Advisory Group (FPAG). The FPAG replaces the Deepwater Environmental Engagement Forum (EEF) and is an engagement forum for Fisheries New Zealand to meet with iwi and stakeholders (industry and eNGO representatives).

Overall Purpose of the FPAG:

- To be a forum for input and discussion of issues associated with the implementation of the National Fisheries Plan for Deepwater and Middle-depth Fisheries (Fish Plan), development and implementation of fishery-specific chapters, and implementation National Plans of Action (NPOAs); and
- To provide a platform through which Fisheries New Zealand can communicate upcoming management developments and obtain input on issues that will be the subject of consultation.

Scope:

- The FPAG is primarily a forum to facilitate the exchange of information, concerns, ideas and perspectives;
- The FPAG will operate in a way that is open and transparent;
- Within the Fisheries Plan framework, the FPAG will engage in pragmatic dialogue on the effective management of deepwater fisheries, in particular to inform management actions through;
- Discussion of fishery-specific interactions during the development of fishery-specific Fish Plan chapters;
- Discussion on the performance of fisheries against management objectives, identification of areas where existing performance does not meet objectives, identification of services to improve performance and views on prioritisation of those services; and
- Discussion to assist the development and implementation of national-level environmental management policy such as NPOAs.

Out of scope:

- The FPAG will not be a substitute for statutory consultation, nor is it the only forum that the Fisheries New Zealand Deepwater team may use to engage and consult with iwi and stakeholders;
- The FPAG is not a science review forum and will not focus on technical aspects related to research contracts relevant to deepwater fisheries. Science peer review of research is conducted by Fisheries New Zealand's science staff and science working groups, in particular the Deepwater Working Group (DWWG), Aquatic Environment Working Group (AEWG), and the Biodiversity Research Advisory Group (BRAG); and
- The FPAG is not a decision making body. Fisheries New Zealand has the statutory role of advising the Minister of Fisheries, who ultimately makes decisions around fishing activity pursuant to fisheries legislation.

Membership:

- Fisheries New Zealand will ensure that teleconferencing facilities will be made available for FPAG meetings when members cannot attend;

- Membership will be as consistent as possible. Members that leave FPAG will be asked to nominate a replacement. Consistent membership helps to promote continuity between meetings;
- Agenda items may be suggested to the FPAG meeting organiser by any FPAG member provided they are consistent with the purpose and scope of the forum;
- Fisheries New Zealand representatives will include relevant analysts, managers, and science team members;
- Other government agencies (for example the Department of Conservation) will be represented as appropriate; and
- Fisheries New Zealand will not reimburse the participants for any expenses incurred for attendance at meetings.

FPAG Chair:

- FPAG meetings will be chaired by a representative from Fisheries New Zealand.

Communication and Record Keeping:

- Fisheries New Zealand will facilitate and maintain communication with FPAG members in regard to the meeting schedule and agenda items;
- Actions points from each meeting will be recorded and distributed by Fisheries New Zealand, along with any other relevant meeting documents;
- Relevant documents will be distributed prior to the meeting;
- Any discussion and documents circulated prior to, or within, any FPAG meeting should be considered works in progress and therefore may not be circulated to any media organisation(s) or person(s) that are not a member of the FPAG, without prior approval from the Chair.

Appendix V: Cost recovery levies ($) for deepwater stocks for the 2018/19 financial year

Table 38: Cost recovery levies ($) for deepwater stocks for the 2018/19 financial year

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2018/19 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
BAR 4	36,419	9,829	7,822	1,189	5,156	-	-1,406	151	59,160
BAR 5	33,853	9,137	21,092	1,085	4,793	1,070	-11,731	102	59,401
BAR 7	110,494	29,822	75,353	24,902	7,384	9,824	-55,717	-9,646	192,416
BYX 1	5,455	1,472	24	-	203	-	-943	-	6,211
BYX 10	278	75	1	-	-	-	-30	-	324
BYX 2	48,670	13,136	20,391	1,752	1,809	-	-16,185	-1,179	68,394
BYX 3	29,463	7,952	8,612	1,039	1,095	-	7,321	-522	54,960
BYX 7	2,401	648	11	-	89	-	187	-	3,336
BYX 8	571	154	3	-	21	-	61	-	810
CDL 1	15,855	4,279	70	-	318		-1,750	-	18,772
CDL 10	-	-	-	-	-	-	-	-	-
CDL 2	6,417	1,732	3,016	233	129	-	-2,029	-137	9,361
CDL 3	2,793	754	12	-	56	-	- 220	-	3,395
CDL 4	581	157	3	-	12	-	- 96	-	657
CDL 5	172	46	1	-	3	-	-33	-	189
CDL 6	13	4	-	-	-	-	-1	-	16
CDL 7	515	139	2	-	10	-	-58	-	608
CDL 8	-	-	-	-	-	-	-	-	-
CDL 9	57	15	-	-	1	-	-6	-	67
CHC 1	29	8	-	-	-	-	-3	-	34
CHC 10	-	-	-	-	-	-	-	--	-
CHC 2	29	8	-	-	-	-	-3	-	34
CHC 3	11	3	-	-	-	-	-1	-	13
CHC 4	11	3	-	-	-	-	-1	-	13
CHC 5	11	3	-		-	-	-1	-	13
CHC 6	11	3	-	-	-	-	-1	-	13
CHC 7	11	3	-	-	-	-	-1	-	13
CHC 8	11	3	-	-	-	-	-1	-	13
CHC 9	11	3	-	-	-	-	-1	-	13
EMA 3	2,273	614	10	-	45	56	-251	3	2,750
EMA 7	19,526	5,270	30,164	4,403	1,182	483	-9,589	-1,807	49,632
FRO 3	4121	1,112	18	-	82	-	-405	-	4,928
FRO 4	121	33	1	-	2	-	-13	-	144
FRO 5	2,544	687	11	-	50	-	-256	-	3,036
FRO 6	77	21	-	-	2	-	-9	-	91
FRO 7	33,701	9,096	148	-	668	-	-3,509	-	40,104
FRO 8	1,531	413	7	-	30	-	-292	-	1,689
FRO 9	405	109	2	-	8	-	-69	-	455
GSC 1	3	1	-	-	-	-	-	-	4
GSC 10	-	-	-	-	-	-	-	-	-
GSC 3	40	11	-	-	-	-	-4	-	47
GSC 5	54	15	-	-	-	-	-5	-	64
GSC 6A	63	17	-	-	-	-	-37	-	43

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2018/19 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
GSC 6B	677	183	3	-	-	-	-59		804
GSH 4	1,725	466	8	-	35	43	-158	2	2,121
GSH 5	458	124	2	-	43	10	-65	-	572
GSH 6	440	119	2	-	9	-	-43	-	527
GSP 1	6,741	1,819	30	-	135	167	-694	8	8,206
GSP 5	2,534	684	11	-	51	-	-320	-	2,960
GSP 7	1,016	274	4	-	20	25	-85	1	1,255
HAK 1	95,822	25,862	5,408	3,132	143,919	2,832	-25,397	883	252,461
HAK 10	168	45	1	-	-	-	-18	-	196
HAK 4	34,030	9,185	2,265	1,111	170,600	1,006	-3,810	422	214,809
HAK 7	80,393	21,698	13,323	3,757	892,987	2,376	-28,630	-983	984,921
HOK 1	1,427,005	385,144	901,730	174,493	1,476,482	76,359	-4,739	-	4,436,474
HOK 10	114	31	1	-	-	-	-12	-	134
JMA 3	28,454	7,680	63,908	1,840	3,652	704	-4,600	333	101,971
JMA 7	93,533	25,244	144,093	21,078	70,085	2,765	-44,265	-8,770	303,763
KIC 1	29	8	-	-	-	-	-3		34
KIC 10	-	-	-	-	-	-	-	-	-
KIC 2	29	8	-	-	-	-	-3	-	34
KIC 3	29	8	-	-	-	-	-3	-	34
KIC 4	29	8	-	-	-	-	-3	-	34
KIC 5	29	8	-	-	-	-	-3	-	34
KIC 6	29	8	-	-	-	-	-3	-	34
KIC 7	29	8	-	-	-	-	-3	-	34
KIC 8	29	8	-	-	-	-	-3	-	34
KIC 9	29	8	-	-	-	-	-3	-	34
LDO 1	3,563	962	16	-	71	-	-487	-	4,125
LDO 10	21	6	-	-	-	-	-2	-	25
LDO 3	13,238	3,573	58	-	262	-	-1,279	-	15,852
LIN 3	81,556	22,012	20,110	5,534	221,414	3,826	-11,912	10	342,550
LIN 4	167,230	45,135	38,910	11,342	229,079	4,136	-23,431	20	472,421
LIN 5	145,996	39,404	28,921	5,130	88,550	8,180	-29,641	-1,698	284,842
LIN 6	317,517	85,697	79,285	21,309	118,444	9,385	-52,289	-3,391	575,957
LIN 7	118,748	32,050	4,668	9,719	844,673	31,116	-30,846	-2,476	1,007,652
OEO 1	21,043	5,679	2,419	212	2,476	826	-31,617	-1,038	-
OEO 10	84	23	-		-	-	-11	-	96
OEO 3A	28,197	7,610	11,392	992	146,383	1,106	-193,582	-2,099	-1
OEO 4	25,251	6,815	10,204	889	119,682	991	-161,953	-1,880	-1
OEO 6	50,503	13,630	5,807	501	5,943	2,225	-8,331	-156	70,122
ORH 1	53,725	14,500	11,819	1,933	6,286	2,367	-21,011	3,073	72,692
ORH 10	354	96	2	-	-	-	-38	-	414
ORH 2A	21,913	5,914	3,678	791	2,579	966	-7,471	1,250	29,620
ORH 2B	2,762	745	444	98	325	122	-943	158	3,711
ORH 3A	8,342	2,251	1,405	300	982	327	-1,866	506	12,247
ORH 3B	239,355	64,601	76,700	10,834	93,035	10,547	-56,021	17,423	456,474
ORH 7A	76,535	20,657	24,636	3,101	49,393	-	-13,459	2,741	163,604
ORH 7B	35	10	-	-	4	-	-49	-	-
PRK 1	1,196	323	5	-	24	-	-124	-	1,424

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2018/19 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
PRK 10	-	-	-	-	-	-	-	-	-
PRK 2	171	46	1	-	3	-	-18	-	203
PRK 3	49	13	-	-	1	-	-5	-	58
PRK 4A	49	13	-	-	1	-	-5	-	58
PRK 5	49	13	-	-	1	-	-5	-	58
PRK 6A	49	13	-	-	1	-	-5	-	58
PRK 6B	49	13	-	-	1	-	-5	-	58
PRK 7	8	2	-	-	-	-	-5	-	5
PRK 8	49	13	-	-	1	-	-5	-	58
PRK 9	49	13	-	-	1	-	-5	-	58
PTO 1	7,066	1,907	31	-	-	-	-621	-	8,383
RBT 1	106	29	-	-	2	-	-11	-	126
RBT 10	-	-	-	-	-	-	-	-	-
RBT 3	3,067	828	522	98	61	-	-465	-	4,111
RBT 7	15,817	4,269	70	-	313	-	-1,644	-	18,825
RBY 1	9,773	2,638	43	-	194	-	-947	-	11,701
RBY 10	-	-	-	-	-	-	-	-	-
RBY 2	1,668	450	381	62	33	-	-609	-	1,985
RBY 3	111	30	-	-	2	-	-2	-	141
RBY 4	63	17	-	-	1	-	-81	-	-
RBY 5	-	-	-	-	-	-	-	-	-
RBY 6	-	-	-	-	-	-	-	-	-
RBY 7	206	56	1	-	4	-	-20	-	247
RBY 8	98	26	-	-	2	-	-10	-	116
RBY 9	199	54	1	-	4	-	-21	-	237
RIB 3	6,346	1,713	28	-	248	-	-458	-	7,877
RIB 4	3,630	980	16	-	158	-	-297	-	4,487
RIB 5	527	142	2	-	21	-	-50	-	642
RIB 6	2,516	679	11	-	99	-	-157	-	3,148
RIB 7	3,540	955	16	-	139	-	-367	-	4,283
RIB 8	12	3	-	-	-	-	-1	-	14
SBW 1	420	113	2	-	26	-	-8	-	553
SBW 6A	9,833	2,654	43	-	600	1,354	-1,022	-159	13,303
SBW 6B	25,142	6,786	2,689	2,031	97,470	3,582	-2,029	-357	135,314
SBW 6I	352,552	95,153	32,099	37,708	63,824	50,232	-40,806	-5,692	585,070
SBW 6R	43,969	11,867	121,873	4,702	2,117	1,725	-2,858	-710	182,685
SCI 1	29,193	7,879	16,540	4,909	318,074	722	-58,048	-1,787	317,482
SCI 10	-	-	-	-	-	-	-	-	-
SCI 2	35,165	9,491	22,979	5,917	42,700	870	-58,482	-1,786	56,854
SCI 3	87,056	23,496	46,886	14,645	22,013	-	-33,551	-5,106	155,439
SCI 4A	27,721	7,482	16,534	4,661	1,852	686	-10,813	-1,624	46,499
SCI 5	7,897	2,131	35	-	528	-	-1,114	-	9,477
SCI 6A	66,628	17,983	42,143	11,208	925,630	8,870	-802,887	-3,830	265,745
SCI 6B	9,872	2,664	43	-	660	292	-1,091	-292	12,148
SCI 7	19,806	5,346	87	-	1,324	-	-2,089	-	24,474
SCI 8	987	266	4	-	66	-	-138	-	1,185
SCI 9	6,910	1,865	30	-	462	-	-975	-	8,292

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2018/19 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
SKI 3	5,000	1,350	22	-	100	124	-552	6	6,050
SKI 7	5,184	1,399	23	-	104	128	-537	6	6,307
SPD 4	6,035	1,629	27	-	120	149	-627	7	7,340
SPD 5	8,979	2,424	3,431	3,447	6,417	3,611	-2,839	-2,039	23,431
SPE 3	8,713	2,352	38	-	1,271	216	-7,603	11	4,998
SPE 4	5,713	1,542	25	-	115	141	-780	9	6,765
SPE 5	292	79	1	-	43	-	-23	-	392
SPE 6	21	6	-	-	-	-	-8	-	19
SPE 7	659	178	3	-	47	16	-75	1	829
SQU 10T	163	44	1	-	-	-	-17	-	191
SQU 1J	81,371	21,962	9,556	-	19	-	-71,849	-	41,059
SQU 1T	782,119	211,091	239,155	77,834	72,190	41,851	-79,997	12,164	1,356,407
SQU 6T	567,936	153,284	225,593	56,523	181,011	83,844	-54,823	4,988	1,218,356
SWA 1	32,158	8,679	10,127	1,504	2,149	795	-3,851	-284	51,277
SWA 10	118	32	1	-	-	-	-13	-	138
SWA 3	28,989	7,824	5,717	946	22,379	857	-3,183	380	63,909
SWA 4	50,272	13,568	9,437	3,250	25,393	1,745	-4,268	554	99,951
WWA 1	80	22	-	-	4	-	-8	-	98
WWA 10	-	-	-	-	-	-	-	-	-
WWA 2	2,014	543	9	-	100	50	-201	2	2,517
WWA 3	14,845	4,007	65	-	734	367	-1,641	19	18,396
WWA 4	8,250	2,227	36	-	408	204	-890	10	10,245
WWA 5B	81,510	21,999	6,128	2,610	4,032	2,409	-5,580	-336	112,772
WWA 7	2,932	791	13	-	145	73	-319	4	3,639
WWA 8	22	6	-	-	1	-	-2	-	27
WWA 9	-	-	-	-	-	-	-	-	-
Grand Total	**5,980,929**	**1,614,239**	**2,430,560**	**544,754**	**6,506,190**	**378,753**	**-2,117,789**	**-14,537**	**15,323,099**

Table 39: Levies by stock as a percent of landed value for the 2018/19 fishing year[122]

Fish stock	Total levies ($)	Landings (kg)	Port price ($/kg)	Landed value ($)	Levies as % landed value
BAR 4	$59,160	2,016,354	$0.26	$533,527	11%
BAR 5	$59,401	8,130,980	$0.26	$2,140,887	3%
BAR 7	$192,416	4,053,050	$0.28	$1,136,070	17%
BYX 1	$6,211	10,790	$2.02	$21,815	28%
BYX 2	$68,394	1,513,578	$2.04	$3,087,548	2%
BYX 3	$54,960	806,683	$1.73	$1,398,788	4%
BYX 7	$3,336	11,113	$1.94	$21,513	16%
CDL 1	$18,772	39,517	$0.93	$36,573	51%
CDL 2	$9,361	371,560	$0.94	$349,675	3%
CDL 3	$3,395	177,440	$0.91	$161,275	2%
CDL 4	$657	13,030	$0.62	$8,033	8%
CDL 5	$189	86,549	$0.67	$57,936	0%
CDL 7	$608	5,849	$0.72	$4,184	15%
EMA 3	$2,750	31,742	$0.35	$10,973	25%
EMA 7	$49,632	2,626,202	$0.18	$480,858	10%
FRO 3	$4,928	12,161	$1.64	$19,944	25%
FRO 4	$144	100,347	$0.30	$30,315	0%
FRO 5	$3,036	3,673	$0.27	$995	305%
FRO 7	$40,104	1,999,008	$0.90	$1,799,107	2%
FRO 8	$1,689	506,960	$0.17	$83,800	2%
FRO 9	$455	170,759	$0.31	$53,550	1%
GSH 4	$2,121	165,800	$0.32	$53,752	4%
GSH 5	$572	50,590	$0.32	$16,047	4%
GSH 6	$527	68,149	$0.39	$26,646	2%
GSP 1	$8,206	514,514	$0.38	$195,361	4%
GSP 5	$2,960	304,604	$0.35	$107,495	3%
GSP 7	$1,255	20,926	$0.37	$7,674	16%
HAK 1	$252,461	896,082	$1.80	$1,611,245	16%
HAK 4	$214,809	182,830	$1.46	$267,681	80%
HAK 7	$984,921	1,562,469	$1.30	$2,034,803	48%
HOK1	$4,436,474	122,387,437	$0.63	$77,630,351	6%
JMA 3	$101,971	4,649,654	$0.21	$975,032	10%
JMA 7	$303,763	31,751,645	$0.18	$5,740,697	5%
LDO 1	$4,125	133,361	$1.46	$194,760	2%
LDO 3	$15,852	287,023	$1.28	$368,021	4%
LIN 3	$342,550	2,015,710	$2.73	$5,502,082	6%
LIN 4	$472,421	2,043,614	$2.48	$5,068,980	9%
LIN 5	$284,842	4,592,574	$2.37	$10,863,734	3%
LIN 6	$575,957	3,705,710	$2.48	$9,194,608	6%
LIN 7	$1,007,652	3,057,525	$2.43	$7,420,307	14%
OEO 6	$70,122	1,613,002	$0.71	$1,150,554	6%
ORH 1	$72,692	592,171	$1.77	$1,045,952	7%
ORH 2A	$29,620	490,514	$2.91	$1,425,532	2%
ORH 2B	$3,711	60,449	$2.38	$143,959	3%
ORH 3A	$12,247	128,650	$2.32	$298,417	4%

[122] Fish stock not shown if either total levies collected or landed value was less than $100.

Fish stock	Total levies ($)	Landings (kg)	Port price ($/kg)	Landed value ($)	Levies as % landed value
ORH 3B	$456,474	5,156,728	$2.42	$12,503,003	4%
ORH 7A	$163,604	1,589,267	$2.47	$3,919,132	4%
PRK 1	$1,424	299	$3.42	$1,023	139%
PTO 1	$8,383	20	$10.00	$200	4,192%
RBT 3	$4,111	2,647,666	$0.10	$259,736	2%
RBT 7	$18,825	25,741	$0.39	$10,039	188%
RBY 1	$11,701	47,066	$1.54	$72,373	16%
RBY 2	$1,985	140,762	$0.27	$37,978	5%
RBY 7	$247	15,980	$0.44	$6,988	4%
RBY 9	$237	1,572	$0.73	$1,155	21%
RIB 3	$7,877	357,766	$0.66	$237,127	3%
RIB 4	$4,487	198,617	$0.52	$103,897	4%
RIB 5	$642	36,000	$0.58	$20,999	3%
RIB 6	$3,148	113,113	$0.38	$42,926	7%
RIB 7	$4,283	150,836	$0.57	$85,403	5%
SBW 1	$553	32650	$0.30	$9,795	6%
SBW 6A	$13,303	217675	$0.42	$91,424	15%
SBW 6B	$135,314	1100625	$0.56	$616,350	22%
SBW 6I	$585,070	15147214	$0.63	$9,542,745	6%
SBW 6R	$182,685	35701	$0.56	$19,993	914%
SCI 1	$317,482	119,387	$17.04	$2,034,486	16%
SCI 2	$56,854	156,669	$16.10	$2,522,340	2%
SCI 3	$155,439	412,688	$17.94	$7,401,931	2%
SCI 4A	$46,499	121,817	$16.18	$1,971,231	2%
SCI 5	$9,477	58	$13.83	$802	1,181%
SCI 6A	$265,745	257,177	$15.25	$3,922,592	7%
SCI 7	$24,474	1,018	$18.50	$18,832	130%
SKI 3	$6,050	575,629	$1.21	$693,748	1%
SKI 7	$6,307	934,443	$1.37	$1,281,121	0%
SPD 4	$7,340	1,147,125	$0.26	$298,253	2%
SPD 5	$23,431	1,098,121	$0.17	$186,681	13%
SPE 3	$4,998	555,539	$0.71	$392,988	1%
SPE 4	$6,765	430,668	$0.32	$139,493	5%
SPE 5	$392	18,451	$0.50	$9,255	4%
SPE 7	$829	47,320	$0.44	$20,996	4%
SQU 1T	$1,356,407	34,211,738	$1.22	$41,892,273	3%
SQU 6T	$1,218,356	9,180,069	$1.25	$11,429,186	11%
SWA 1	$51,277	463018	$0.76	$351,060	15%
SWA 3	$63,909	3268236	$0.71	$2,314,565	3%
SWA 4	$99,951	4876317	$0.82	$3,995,167	3%
WWA 2	$2,517	5,369	$1.93	$10,373	24%
WWA 3	$18,396	211,468	$1.62	$343,339	5%
WWA 4	$10,245	90,849	$1.75	$159,095	6%
WWA 5B	$112,772	680,325	$2.02	$1,372,624	8%
WWA 7	$3,639	39,663	$1.58	$62,588	6%

Appendix VI: Observer interim trip report template

Ministry for Primary Industries
Manatū Ahu Matua

Interim Observer Trip Report	
Trip Number:	**Vessel Name:**
Call Sign:	**Observer:**
Trip Start Date:	**Trip End Date:**

Q	Criteria	Rating
1	QMS species are discarded only after correct estimation and authorisation	
2	QMS species identified accurately	
3	Vessel has a valid system for determining, recording and retaining block weight test information	
4	Vessel has a valid system in place to quantify all sources of whole and processed fish to meal; including applying conversion factor to processed fish	
5	Fish is cut in accordance with the Conversion Factors Notice	
6	Non-fish by-catch recorded and reported accurately	
7	Offal management was adequate (if VMP onboard, meets specifications)	
8	Appropriate bird mitigation devices were deployed and in working condition for duration of trip	
9	The factory was clean and hygienic	
10	Observer Standard met (e.g. living conditions, water etc, were adequate)	
11	Vessel was using/applying glaze during trip	Y / N
12	If conversion factor (CF) tested insert species, state, and average CF over page	
13	If any maritime or safety issues were identified insert comment over page	
14	If any labour or employment issues were brought to your attention by any crew insert comment over page	
15	Comment on any issues raised with Captain or Factory Manager during trip and the outcome (include names of people spoken too)	

Criteria Rating:	**A** Clearly acceptable.	**B** Generally acceptable but minor departures from best practice identified.	**C** Not Deemed Acceptable: this criterion is not met and requires addressing	**N/A** Not applicable

Should you not receive a copy of the full observer report, or have any questions, please contact the Observer Programme via the following email address: observer@mpi.govt.nz

Signed: **Date:**

Manager Observer Services

Question Number	Comment

12	Conversion Factors		
SPECIES	STATE	# of TESTS	AVERAGE CF
SPECIES	STATE	# of TESTS	AVERAGE CF
SPECIES	STATE	# of TESTS	AVERAGE CF