Fisheries New Zealand
Tini a Tangaroa

Annual Review Report for Deepwater Fisheries 2019/20

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Prepared by the Deepwater Team, Fisheries Management, Fisheries New Zealand

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1. Introduction

1.1 OVERVIEW OF NEW ZEALAND'S COMMERCIAL DEEPWATER FISHERIES

New Zealand's commercial 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 million.

The management of New Zealand's commercial 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 Deepwater Group (DWG).[2] This arrangement allows for the Management Objectives outlined in the National Fisheries Plan for Deepwater and Middle-depth Fisheries 2019 to be achieved by drawing on the combined knowledge, experience, capabilities and perspectives of both organisations.

Within the commercial 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 commercial 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, which meansthe 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

The management of New Zealand's deepwater fisheries encompasses all deepwater target fish stocks, bycatch species and associated environmental impacts. Since 2010, New Zealand's deepwater fisheries management has been implemented through a number of iterations of the National Fisheries Plan for Deepwater and Middle-depth Fisheries (National Deepwater Plan). The current iteration is the National Deepwater Plan 2019[4]. 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).

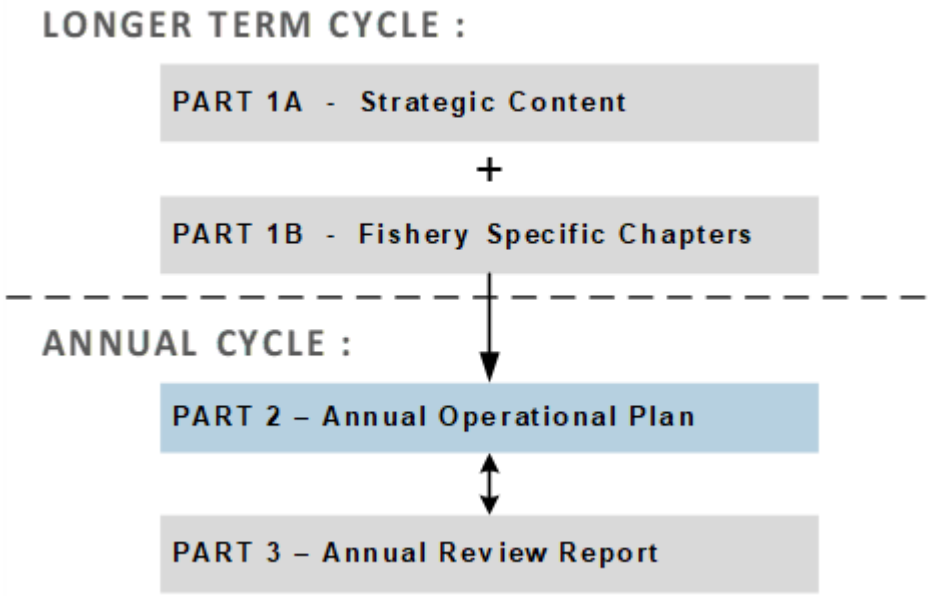

Figure 1: The three components of the National Deepwater Plan.

Part 1 of the National Deepwater Plan 2019 establishes the enabling framework for the management of New Zealand's deepwater fisheries. Part 1 of the National Deepwater Plan 2019 is further divided into two parts, Part 1A and Part 1B.

Part 1A of the National Deepwater Plan 2019 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 for Oceans and Fisheries 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 (see Figure 2 below), structure and content, however the high-level structure of the National Deepwater Plan,

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

including the fisheries specific chapters, and annual planning and review processes (as described in this section) remained the same.

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 2019, which include Fisheries Plans for each fishery. These Fisheries Plans provide management objectives at the fishery level, in line with the management objectives outlined in Part 1A. Fisheries Plans 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 Fisheries Plans for the scampi and squid

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

fisheries developed. Following input and participation from tangata whenua and public consultation, Fisheries Plans will be provided to the Minister for Oceans and Fisheries for approval.

Part 2 of the National Deepwater Plan consists of an Annual Operational Plan (AOP), which details the management priorities and actions that will be implemented on an annual basis for deepwater fisheries for each financial year. It also 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 for Oceans and 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 against the management priorities and actions identified in the previous financial year's 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 2019/20 DEEPWATER ANNUAL REVIEW REPORT

This Annual Review Report is split into three parts:

Part 3A describes the progress that has been made during the 2019/20 financial year (1 July 2019 – 30 June 2020) towards delivering the management actions set out in the 2019/20 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 2019.

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 2019/20 October Fishing Year (1 October 2019 – 30 September 2020).

			2019									**2020**			
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	

2019/20 Financial year
2019/20 Fishing year

Figure 3: The months encompassed by the 2019/20 Financial Year and Fishing Year respectively.

This Annual Review Report also contains several appendices:

- Appendix I summarises the commercial catch of deepwater stocks during the 2019/20 Fishing Year. Also included, where available, are observer coverage details, the amount of deemed values invoiced, and export earnings during the 2019 calendar year;
- Appendix II summarises the results of the October 2019 sustainability rounds;
- Appendix III comprises The Deepwater Fish Plan Advisory Group (FPAG) Terms of Reference;

[6] The Annual Operational Plan for Deepwater Fisheries 2019-20 can be accessed online: https://www.fisheries.govt.nz/dmsdocument/36804-Annual-Operational-Plan-for-Deepwater-Fisheries-201920

- Appendix IV MSC certified stocks and the relevant data used to review the certification
- Appendix V summarises cost recovery levies for deepwater stocks for the 2019/20 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 2019/20 AOP identified 17 management actions that aimed to progress delivery of the management objectives specified in Part 1A of the National Deepwater Plan 2019, which are referenced in Figure 2. Table 2 summarises progress relating to each of these management actions. For reference, the 2019/20 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 2019/20 Financial Year

1	**Fisheries Sustainability Controls:** Review catch limits and management settings as required
	Deepwater sustainability decisions primarily consist of reviews to catch limits (TACs[7] and TACCs[8]) and deemed value rate settings across the fish stocks managed within the National Deepwater Plan 2019. These reviews are completed in two rounds, one for stocks managed with a Fishing Year beginning on 1 October and another 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 2019/20: Stocks undergoing assessment or characterisation to be considered for review: • October 2019: HOK1, HAK7, LIN7, ORH7A, SKI3, SKI7, ORH3B[9]; • April 2020: SBW6B, SBW6I; and • October 2020: HAK4, ORH3B, LIN7, ORH7B, OEO3A (BOE), SCI3, SWA3, SWA4, JMA7.[10] **Core Action for 2019/20** • Review deemed value rates for deepwater stocks identified as meeting criteria for review

[7] Total allowable catch.

[8] Total allowable commercial catch.

[9] In his decision letter for the October 2018 sustainability round, the Minister noted that he chose to increase the TAC for the ORH3B stock over three years. He also noted his intention to consult with stakeholders and make separate TAC/TACC decisions for the two fishing years starting 1 October 2019 and 1 October 2020.

[10] These stocks were included as results were due to be presented to the relevant working group during the term of the 2019/20 AOP.

	Action linked to Management Objectives 1, 2, 3, 4, 9 & 10.
	Actions achieved: For the 1 October 2019 sustainability round, catch limits were reviewed and changed for seven deepwater stocks: • Gemfish (SKI3 and SKI7) – for both stocks the TAC was increased from 300 tonnes to 606 tonnes. The new TAC consisted of a 599 tonne TACC (increased from 300 tonnes), a 5 tonne allowance for other sources of fishing-related mortality (set for the first time at 1% of the TACC), setting a 1 tonne Māori customary fishing allowance and the retention of 0 tonne allowance for recreational fishing interests. • Hake (HAK7) – the TAC was decreased from 5,120 to 2,300 tonnes. The new TAC consisted of a 2,272 tonne TACC (decreased from 5,064 tonnes), a 23 tonne allowance for other sources of fishing-related mortality (reduced from 51 tonnes and set at 1% of the TACC), and retention of the 5 tonne Māori customary fishing allowance and 0 tonne allowance for recreational fishing interests. • Hoki (HOK1) – the TAC was decreased from 151,540 tonnes to 116,190 tonnes. The new TAC consisted of a 115,000 tonne TACC (reduced from 150,000 tonnes), a 1,150 tonne allowance for other sources of fishing-related mortality (reduced from 1,500 tonnes and set at 1% of the TACC), and retention of the 20 tonne allowance for both Māori customary fishing and recreational fishing interests.[11] • Ling (LIN7) – the TAC was increased from 3,144 to 3,458 tonnes. The new TAC consisted of a 3,387 tonne TACC (increased from 3,080 tonnes), a 68 tonne allowance for other sources of fishing-related mortality (increased from 62 tonnes and set at 2 of the TACC), a 2 tonne Māori customary fishing allowance (increased from 1 tonne) and retention of the 1 tonne allowance for recreational fishing interests. • Orange roughy (ORH3B) – the TAC was increased from 6,413 tonnes to 7,116 tonnes. The new TAC consisted of a 6,772 tonne TACC (increased from 6,091 tonnes), a 339 tonne allowance for other sources of fishing-related mortality (increased from 317 tonnes and set at 5% of the TACC), and retention of the 5 tonne Māori customary fishing allowance and 0 tonne allowance for recreational fishing interests.[12] • Orange roughy (ORH7A) – the TAC was increased from 1,680 to 2,163 tonnes. The new TAC consisted of a 2,058 tonne TACC (increased from 1,600 tonnes), a 103 tonne allowance for other sources of fishing-related mortality (increased from 80 tonnes and set at 5% of the TACC) For the 1 October 2019 sustainability round, deemed value rates were reviewed and changed for six deepwater stocks: • The annual deemed value rate for cardinalfish in CDL5 was reduced from $0.52/kg to $0.30/kg • The annual rate for jack mackerel in JMA7 was increased from $0.15/kg to $0.20/kg. Additionally, a special differential deemed value rate schedule was introduced with the maximum rate of $0.30/kg applying to catch >120% of ACE holdings • The standard differential schedule for rubyfish for the RBY5 and RBY6 stocks was removed • The deemed values rates for two silver warehou stocks (SWA3 and SWA4) were reduced and standardised. The annual rate was set at $0.70/kg (down from $1.74/kg for SWA3

[11] The Minister also requested that the TACC reduction came off the western stock catch limit, which was reduced from 90,000 to 55,000 tonnes

[12] The increase resulted in the sub-area catch limit for the East and South Chatham Rise increasing from 4,095 tonnes to 4,775 tonnes.

	and $1.22/kg for SWA4) and the maximum annual rate set at $2.00/kg (down from $3.00 for both stocks). • For the 1 April 2020 sustainability round, catch limits were reviewed for SBW6B: TAC was reduced to 2,888 tonnes. The new TAC consisted of a 2,830 tonne TACC (reduced from 3,145 tonnes), a 58 tonne allowance for other sources of fishing-related mortality (reduced from 64 tonnes and set at 2% of the TACC) and retention of the 0 tonne allowances for Māori customary fishing and recreational fishing. • Additionally, Fisheries New Zealand used the 1 April 2020 sustainability round to review the TACs for six stocks that are subject to the October fishing year. All six stocks had a TACC of 0 tonnes, based on the absence of reported catch prior to QMS introduction. Three of the stocks were deepwater stocks; two rubyfish stocks (RBY5 and RBY6) and one white warehou stock (WWA9). The TAC and TACC for RBY5 was increased to 2 tonnes, while the TAC and TACC for RBY6 and WWA9 was increased to 1 tonne. • The 1 April 2020 sustainability round was also used to standardise the interim deemed value rates for 454 stocks (both April and October fishing year) at 90% of the annual rate. • For the 1 October 2020 sustainability round, consultation and decision documents were prepared for 11 deepwater stocks; orange roughy (ORH3B), scampi (SCI1), cardinalfish (CDL5), rubyfish (RBY4) silver warehou (SWA3 and SWA4) and frostfish (FRO3/4 and FRO7-9). The Deepwater Team also contributed to the documents prepared for the two kingfish stocks that are primarily taken by the deepwater fleet (KIN7 and KIN8). • The Deepwater Team also prepared the consultation and decision documents reviewing deemed value settings for the 1 October 2020 sustainability round. For that round, five deepwater stocks underwent deemed value rate review: squid (SQU1T, SQU6T, SQU1J), redbait (RBT3) and gemfish (SKI7). • As at 1 October 2020, 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 eight of the ten vessels during the 2019/20 fishing year. • No changes were made to any gazetted conversion factors during the 2019/20 financial year.

2	**Fisheries Planning:** Implement updated National Deepwater Plan
	The National Deepwater Plan (2010) was reviewed between 2016 and 2018, culminating in a revised National Deepwater Plan being published in 2019. Implementation of the Deepwater Plan 2019 for the 2019/20 financial year will include the core activities listed below.
	Core Actions for 2019/20: • Compile the Annual Review Report for 2018/19; • Develop the Annual Operational Plan for 2020/21; and • Develop and review species-specific chapters for the Deepwater Plan (orange roughy and oreo; scampi; southern blue whiting; and squid).
	Action linked to all Management Objectives
	Actions achieved:

	• The Annual Review Report for 2018/19 was completed and made available in March 2020;[13] • The Deepwater Team also trialled a shortened (12 pages) version of the ARR[14] • The Annual Operational Plan for 2020/21 was completed and made available in July 2020;[15] and • Development of species-specific Fisheries Plans has been slow but progressed in 2019/20 for orange roughy and oreo, scampi, southern blue whiting and squid.

3	**Ministerial Services**: Ensure timely completion of all Ministerial correspondence and communication requests assigned to the Deepwater 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 2019/20: • Provide quality advice and information to the Minister of Fisheries; and • Maintain an open relationship with stakeholders and the public. Respond to all Official Information Act requests and government correspondence regarding deepwater fisheries issues in a timely manner.
	Action linked to Management Objectives 9, 10 & 11
	Actions achieved: During the 2019/20 financial year, the Deepwater Fisheries Management team completed: • Five Aide Memoires; • Four Briefing Papers; • Sixteen Ministerial responses; • Two Submissions to Cabinet; and • Thirteen Written Parliamentary Questions. Since 2014, MPI's Official Information Act (OIA) Team has had responsibility for drafting responses to OIA requests. In 2019/20, the Deepwater Team contributed to the completion of OIA requests as subject matter experts, providing advice and appropriate review of information.

[13] The Annual Review Report for Deepwater Fisheries 2018/19 can be accessed online; https://www.fisheries.govt.nz/dmsdocument/39770-Annual-Review-Report-for-Deepwater-Fisheries-2018-19

[14] The shortened version of the Annual Review Report for Deepwater Fisheries 2018/19 can be accessed online:

https://www.fisheries.govt.nz/dmsdocument/39932-Annual-Review-Report-for-Deepwater-Fisheries-Abstract-201819

[15] The Annual Operational Plan for Deepwater Fisheries 2020/21 can be accessed online; https://www.fisheries.govt.nz/dmsdocument/41334-Annual-Operational-Plan-for-Deepwater-Fisheries-202021

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: **1.** Ensure deepwater fisheries management information is available and accessible for all stakeholders **2.** Provide opportunity for input and participation in the Deepwater Fisheries Planning process and; **3.** Provide for the ongoing management of deepwater fisheries for tangata whenua.
	Key Actions for 2019/20 • Develop an Iwi Engagement Plan. **Core Actions for 2019/20** • 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 tangata whenua and stakeholders on environmental and operational issues relating to management of deepwater fisheries through the biannual Fish Plan Advisory Group (FPAG); and • Advise Fisheries New Zealand representatives attending Iwi Fisheries Forums of upcoming deepwater consultations.
	Action linked to all Management Objectives
	Actions achieved: • Directed efforts were made to engage with tangata whenua for all deepwater fisheries consultations throughout the year, including the preparation and distribution of two-page summaries of all October 2020 sustainability round proposals to iwi and iwi forums. In addition, relevant specific objectives from Iwi Fisheries Plans (IFPs) and Forum Fisheries Plans (FFPs) were incorporated into sustainability round advice to the Minister. • All information relating to the management of deepwater fisheries was made available online for stakeholder and tangata whenua to access. • Fish Plan Advisory Group meetings were held in November 2019 and April 2020. The latter, held during Level 4, was the first meeting to be held entirely virtual; • Deepwater Vessel Operators meetings were held in December 2019 (Christchurch) and June 2020 (online); • Fisheries Management engaged with iwi representatives and other members of the Deemed Values Working Group, to finish a review of the operation of the deemed values regime.[16]; and • The first meeting of the Commercial Catch Balancing Forum, which was one of the recommendations of the Deemed Values Working Group, was held in November 2019.

[16] The Working Group's final report can be accessed online at: https://www.fisheries.govt.nz/dmsdocument/40253-Deemed-values-working-group-Final-report

5	**National Plan Frameworks –** Work collaboratively with the Department of Conservation **and** Ministry of Foreign Affairs & Trade to review and **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 2014 and repeated in 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 (2013) and addressing concerns for at-risk species identified in the risk assessments.[17] The review of the NPOA-Sharks (2013) was led by the Deepwater Fisheries Team in 2019/20. A revised NPOA-Sharks is expected to be approved in mid-2021.
	Key Actions for 2019/20: • Lead the review and revision of the NPOA-Sharks (2013), in consultation with stakeholders • Complete a review of the ban on shark finning, and implement any recommended changes • Update and support delivery on the NPOA-Sharks Implementation Plan across the fisheries management directorate in conjunction with DOC and the Ministry of Foreign Affairs and Trade (MFAT) **Core Actions for 2019/20:** • Engage with key stakeholders at meetings of the New Zealand Sharks Advisory Group; • 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 Memorandum of Understanding on the Conservation of Migratory Sharks (CMS Sharks MOU)[18] and ensure that New Zealand's shark management is consistent with the CMS Sharks MOU and its conservation plan.
	Action linked to all Management Objectives
	Actions achieved: The bulk of the review of the NPOA-Sharks (2013) was postponed until 2020/21 due to other work priorities. Background work undertaken during 2019/20 included: • Completed an in-house review of the regulatory framework to eliminate shark finning in New Zealand commercial fisheries; and • No specific engagement was required on the CMS Sharks MOU, although Fisheries New Zealand provided input on proposals to list shark species on Appendices of CMS and CITES
6	**Protected Species Frameworks – NPOA Seabirds (2013)**: 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) sets out the long term and five year objectives relating to managing fisheries interactions with seabirds. The Plan is currently under review. The NPOA

[17] The NPOA-Sharks is available at http://fs.fish.govt.nz/Page.aspx?pk=165&tk=554 and the latest risk assessment is available at https://fs.fish.govt.nz/Page.aspx?pk=113&dk=24619

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

continues to be 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. The Seabird Risk Assessment also identifies which fisheries pose the most risk to seabird species.

This Management Action outlines the priority seabird work areas for deepwater fisheries in 2019/20 to implement the NPOA-Seabirds. Further detail on the objectives of the NPOA-Seabirds, and how the Deepwater Team will support the achievement of those objectives, can be found in Section 8.1.

Key Actions for 2019/20:

- Continue to investigate and implement any additional practicable and effective measures to minimise the risk of net captures based on the outcomes of the contracted project characterising trawl net captures and potential contributing factors.[19]

Core Actions for 2019/20:

- Refer to Table 6 in section 8: NPOA-Seabirds services planned for Deepwater Fisheries Management during 2019/20 [this reference was to a section in the Annual Operational Plan]

Action linked to Management Objectives 6 and 8

Actions achieved:
During the 2019/20 financial year, the following actions relating to the NPOA Seabirds (2020) were completed:

- The NPOA Seabirds (2020) was approved by the Minister of Fisheries and the Minister of Conservation in May 2020. The Deepwater Team, in collaboration with DOC, was heavily involved with drafting the amended NPOA Seabirds (2020) (and related documents) and advice to Ministers;
- The Deepwater Team supporting drafting the pilot Seabird Annual Report based on the objectives and performance measures of the NPOA Seabirds (2020). The first draft was discussed at the Seabird Advisory Group meeting held in March 2020;
- The Deepwater Team worked with representatives from the commercial fishing industry, Southern Seabirds Solutions and DOC to trial and further develop potential net capture mitigation strategies;
- Actions relating to implementation of the NPOA-Seabirds (2020) are detailed within Section 2.4 of this Report.

[19] The 2019/20 research project is not the same as the net capture project identified in previous AOPs.

7	**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/rāpoka Threat Management Plan 2017-2022 (TMP) prioritises management actions to enable the recovery of the sea lion population.[20]
	Key Actions for 2019/20: • Consultation on a new way of setting the Fishing Related Mortality Limit (FRML) for the SQU6T fishery will take place in August 2019. It will be based on an update of the demographic population model for sea lions; an improved method of estimating interactions between sea lions and squid fishing; and a new approach to estimating how well SLEDs work by accounting for cryptic mortality. • Revised squid (SQU6T) and southern blue whiting (SBW6I) Operational Plans will be put in place for the 2019/20 fishing year. **Core Actions for 2019/20:** • Work with DOC to implement the actions in the TMP; • Engage with key stakeholders at meetings of the New Zealand sea lion/rāpoka Forum and Advisory Group; • Run Squid 6T Operational Plan Technical Advisory Group meetings (SqOPTAG); • Review new sea lion research (population estimates, disease, fisheries interactions, and SLED efficacy) at the Aquatic Environment and Conservation Services Programme working groups and • Review sea lion management actions in the SCI6A fishery.
	Action links to Management Objectives 6 and 8
	Actions achieved: During the 2019/20 financial year, the following actions relating to the New Zealand sea lion/rāpoka Threat Management Plan were completed: • The four-year 'Operational Plan to Manage the Incidental Capture of New Zealand Sea Lions in the Southern Squid Trawl Fishery (SQU6T)' was signed off by the Minister of Fisheries. The term of the Operational Plan is from 21 November 2019 to 30 September 2023; • The '2020 Operational Plan to Manage the Incidental Capture of New Zealand Sea Lions in the Southern Blue Whiting Fishery, Campbell Island (SBW6I)' was finalised. • Work continued with DOC to implement actions outlined in the New Zealand Sea Lion Threat Management Plan; and • Reports were written and finalised for the New Zealand sea lion/rāpoka Forum and Advisory Group meetings in 2019. Meetings in 2020 were postponed due to the COVID-19 pandemic;

[20] Information on the sea lion TMP is available at https://www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/nz-sea-lion-tmp/nz-sea-lion-threat-management-plan.pdf

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 managing the effects of commercial fishing on deepwater benthic communities is through closure of large areas of the EEZ to bottom trawling. 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 here in the ARR.[21]
	Key Actions for 2019/20: • Support the development of objectives to guide the management of benthic impacts. • Contribute to research projects focused on characterising benthic impacts and the benthic environment. **Core Actions for 2019/20:** • Monitor the trawl footprint of deepwater fisheries and 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 organisms captured; • Consider management action if required.[22]
	Action links to Management Objectives 5, 6 and 7
	Actions achieved: • Fisheries New Zealand contracted a research provider to map the annual commercial 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 2019/20 trawl footprint has not yet been published, however preliminary data was obtained for the purpose of this report; • The deepwater team inputted to the development of the trawl research science project. This involved compiling relevant inputs to be used in a spatial planning tool to manage the impacts of bottom fishing on benthic habitats. The support tool enables researchers to test scenarios and allow for the level of biodiversity protection and cost to fishing to be determined; • Details of the 2019/20 trawl footprint and the volume of selected benthic species captures during the 2019/20 fishing year are reported in Section 4.7 of this Report.

[21] The most recent trawl footprint report is accessible 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

[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 2019/20 year and determine future approach to research planning and procurement
	The research required to manage deepwater fisheries is detailed in the Medium Term Research Plan for Deepwater Fisheries.[15] Some research is contracted on an annual basis, while some, such as trawl surveys, is contracted as a package.
	Core Actions for 2019/20: • Finalise and agree the deepwater fisheries research programme, including any proposals for industry-led research, for delivery during the 2020/21 financial year before December 2019; and • Update the Medium-term Research Plan.
	Action linked to all Management Objectives
	Actions achieved: During the 2019/20 financial year, the following actions relating to research planning were completed: • Deepwater research for 2020/21 was planned and discussed with stakeholders at the Fish Plan Advisory Group meeting in November 2019 and March 2020; • The 5-year Medium-term Research Plan for Deepwater Fisheries was updated to enable long term planning of deepwater research.[24]

10	**Deepwater Monitoring:** Deepwater observer coverage/sampling requirements
	Observer coverage of commercial 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. Additional information on observer coverage planning is available in section 9.
	Key Actions for 2019/20: • Work with commercial vessel operators to ensure quarterly fishing plans that accurately reflect likely fishing activity are provided to Fisheries New Zealand in a timely manner. **Core Actions for 2019/20:** • Place observers on deepwater vessels that are using the Modular Harvesting System (MHS) for the first time; • 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; • Develop the observer coverage plan for the 2020/19 financial year including updating sampling targets; and • Contribute towards the redesign of any observer forms deemed necessary.

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

	Action linked to all Management Objectives.
	Actions achieved: • During the 2019/20 financial year, no new deepwater vessels used the MHS. Vessels using MHS gear completed 1,353 tows in the 2019/20 financial year. • A redesigned observer Non-fish Bycatch Form, termed the Protected Species Interaction (PSI) form was used by observers on all trips from 1 August 2019. The redesign of the form was led by the Deepwater Fisheries Management Team. • Quarterly fishing plans were received from industry for all four quarters of the 2019/20 fishing year. • Observer coverage was tracked over the course of the fishing year and compared against the 2019/20 AOP to assist in prioritisation of observer coverage to ensure that biological sampling and desired percentage-level coverage targets were met; • Regular 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 2020/21 observer coverage plan, as well as biological sampling requirements for deepwater fisheries were both completed and made available within the 2020/21 AOP.

11	**Deepwater Monitoring -** Monitor the deepwater fleet's adherence to the range of measures in place to 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 reduce the risk of ongoing adverse effects on protected species in commercial deepwater fisheries. Measures are described in the following Operational Procedures or Plans:[16] • Marine Mammal Operational Procedure (DWG initiative); • Vessel Management Plans (trawl) – seabirds (DWG initiative); • Ling Operational Procedures (bottom longline) – seabirds (DWG initiative); • Shark Operational Procedure (DWG initiative); • Scampi Fisheries Operational Procedure – Seabirds and marine mammals (DWG initiative); and • SQU 6T/SBW 6I Operational Plans - sea lions[17].
	Core Actions for 2019/20: • Audit Vessel Management Plans and other protected species risk management plans against the Mitigation Standards developed to support implementation of the NPOA Seabirds (2020) • Monitor adherence of the deepwater fleet to management measures through Fisheries New Zealand observer coverage; • Report levels of adherence to management measures to stakeholders through the ARR; • Work with DWG to update materials and methods used to educate crew on Operational Procedures and Plans; • Monitor protected species interactions on all observed trips via Fisheries New Zealand Observer debriefs and reporting of agreed protected species trigger points; and • Continue to support the training, outreach and awareness programme run by the DWG Environmental Liaison Officer.

	Action linked to all Management Objectives 5, 6, 7, 8, and 11
	Actions achieved: • The SBW 6I Operational Plan was updated for the 2020 season; and • Details regarding the auditing and monitoring of adherence to Operational Procedures and Plans and Vessel Management Plans (VMPs) by Fisheries New Zealand observers are detailed within Sections 2.4 and 4.1 of this Report.

12	**Deepwater Monitoring:** Monitor adherence to non-regulatory measures in place to manage Tier 1 deepwater fishstocks at a sub-QMA scale
	In conjunction with DWG, Fisheries New Zealand has implemented a series of non-regulatory sub-area commercial catch limits in the hoki, orange roughy, and oreo fisheries. In addition, hoki management areas (HMAs) and hoki seasonal spawn areas (HSSAs) have been developed by industry. The purposes of these areas are to reduce fishing mortality of juvenile hoki in important nursery areas and allow spawning to occur undisturbed at peak times respectively. Measures are described in the following Operational Procedures:[18] • Reporting Operational Procedures; • Orange Roughy & Oreo Operational Procedures; and • Hoki Operational Procedures.
	Core Actions for 2019/20: • Continue auditing fleet adherence to sub-QMA catch limits; • Respond as required where sub-QMA catch limits are exceeded; • Audit fleet adherence to HMA and HSSA management measures; and • Report level of adherence to all measures to stakeholders through the ARR.
	Action inks to Management Objectives 2,3 and 4
	Actions achieved: • Custom data reports, using 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.; • All vessels adhered to the HSSA measures during the winter 2020 hoki fishery. • Summaries of adherence to sub-QMA catch limits and Hoki Operational Procedures are provided within Appendix I of this Report.

13	**Deepwater Monitoring:** Digital Monitoring (DM)
	Between October 2017 and May 2019, only trawl vessels >28 m (i.e. most of the deepwater trawl fleet) were required to use two of the three components of digital monitoring (geospatial position reporting and electronic catch reporting). All remaining fishers and vessels were required to start using geospatial position reporting and electronic catch reporting via a staged process that took place during 2019.

Key Actions for 2019/20:

- Support industry initiatives to deploy cameras on deepwater vessels on a trial basis.

Core Actions for 2019/20:

- Work with the Fisheries New Zealand Digital Monitoring and Data Management teams to monitor the data quality standards and specifications process, continued in the 2019/20 fishing year;
- Identify opportunities to use the additional data arising from geospatial position reporting and electronic catch reporting, to enhance BAU actions;
- Review the information required to be reported by fishers via electronic catch reporting and consider amendments if required; and
- Work with deepwater vessel operators to ensure all geospatial position reporting and electronic catch reporting requirements are well understood and implemented consistently.

Action linked to all Management Objectives

Actions achieved:

During the 2019/20 financial year, the following actions in relation to digital monitoring were completed:

- The rollout of ER/GPR across the entire deepwater fishing fleet was completed in December 2019
- The process of using electronic reporting data to enhance actions undertaken by the Deepwater Fisheries Management team remained ongoing. ER data has proven to be increasingly beneficial to Fisheries Management, enabling more informative and effective decision making.

14	**Registry Services:** Implement the Foreign Owned Vessels [19] 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 (FOV) 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 2019/20

- Provide analysis for each foreign-owned vessel registration application;
- Provide input into High Seas Permit Applications;
- Current role of secretariat for the Inter-Agency Fisheries Group and Governance Group: chair meetings, set the agenda and report back on bi-monthly meetings. As part of the secretariat role, circulate papers in advance of meetings, record the discussions and action points in the minutes, allocate responsibilities to follow up decisions made and update the FOV Risk Register.
- 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 key MPI directorates. The Inter-agency Fisheries Group met once in 2019/20 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 • 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 was signed off in June 2020.

15	**Fisheries Management Controls:** Regulatory amendments
	Progressing 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 Preliminary Impact and Risk Assessment (PIRA), consultation documents, Regulatory Impact Statement (RIS), providing advice and decision 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 2019/20: • Review the Fisheries (Seabird Mitigation Measures – Bottom Longlines) Circular; • Progress legislative amendments potentially resulting from review of the NPOA Sharks (2013); • Progress any other secondary or tertiary legislative amendments as required
	Action linked to Management Objectives 1, 2, 9, 10 and 11
	Actions achieved: • Work to review the Fisheries (Seabird Mitigation Measures – Bottom Longlines) Circular began during the 2019/20 financial year. • No regulatory amendments were required in 2019/20.

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.
	Core Actions for 2019/20: • 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 long line, the HOK, HAK and LIN trawl complex, and ORH fisheries in 2019.
	Action linked to Management Objectives 1, 2, 10 and 11
	Actions achieved: • Deepwater Fisheries Management provided data and support for the annual surveillance audit of orange roughy, hoki hake, ling and southern blue whiting; • Following the surveillance audit of the three certified ORH fisheries all conditions on their certification were removed in April 2020; • No fisheries Fisheries Improvement Plans were updated in 2019/20

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 that incorporate economic aspects of the fishery.
	Key Actions for 2019/20: • Support delivery of a management strategy evaluation for scampi;
	Action linked to Management Objectives 1, 2, 3, 4, 10 and 11
	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 (Northwest Chatham Rise and East & South Chatham Rise subareas), as well as ORH 7A continue to be applied. • The management strategy evaluation for scampi was contracted in August 2020.

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 2019/20 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.[22] 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 2019/20: • Contribute to policy development as required.
	Action linked to all Management Objectives
	Actions achieved: • The Deepwater Fisheries Management team contributed towards the continuing development of Enabling Innovative Trawl Technology (EITT) and MHS[25] regulations and requirements; • The Deepwater Fisheries Management team provided fisheries management advice to MPI Fisheries Policy and the Overseas Investment Office (OIO) on deepwater fisheries related matters; • 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).

[25] Modular Harvesting System

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) [26] **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 2019/20: • Assist Fisheries New Zealand's Fisheries Science team to deliver outputs of all 2019/20 research projects as listed in Tables 8-10; and • Assist Fisheries Science to ensure that all research used to support the management of deepwater fisheries is assessed against the Research Standard.[28]
	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 2019/20 financial year (including additional projects), • All contacted research in 2019/20 and all Final Research Reports relevant to deepwater fisheries published in the 2019/20 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 2019/20 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 Team will continue to work closely with the Observer Programme to ensure the necessary targets are achieved.
	Core Actions for 2019/20: • Assist the Observer Programme to deliver the 2019/20 observer coverage plan by continuing to engage with industry on provision of quarterly fishing plans to the Observer Programme, which facilitates placement of observers and delivery of the required representative levels of coverage; • Ensure the Observer Programme is aware of, and that observers are adequately briefed on, the biological sampling targets for 2019/20 and any new requirements for the Observer Programme; • 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 2019/20 year; and • Engage with, and provide feedback to, observers through the observer newsletter and observer catch-up sessions.

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

	Action linked to all Management Objectives
	Actions achieved: • The delivery of the 2019/20 observer coverage plan and associated biological sampling and percentage-level coverage targets are detailed in Section 3.1 of this Report; • Quarterly fishing plans were requested from industry for the first, second and fourth quarters of the 2019/20 fishing year. All essential quarterly fishing plans were received back from fishing operators; • 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; • The Deepwater Fisheries Management team attended two intakes of observer trainees to provide information on the QMS, Fisheries Science process and VMP auditing.

D	**Cost Recovery Process:** Assist the Business and Financial Advice team with the cost recovery processes for 2019/20 and 2020/21 **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 2019/20: • Ensure the Deepwater Team has input into the port price survey process administered by the MPI Finance Team; and • 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 2019/20 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 monitor fishing activity and catch reporting in 2019/20 with consideration of whole fleet reporting changes (electronic catch and position reporting) and the VADE model. New reporting practices and tools in 2019/20 will determine how fisheries will be monitored and profiled by Compliance in subsequent years.
	Core Actions for 2019/20: • Ensure the Deepwater Team is involved in any discussions relating to future fisheries monitoring and profiling; • Assist the Compliance Directorate with issues relating to interpretation of reporting requirements that arise during implementation of electronic catch and position reporting.
	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 December 2019 and virtually in June 2020; • During 2019/20 Compliance work related to deepwater fisheries included; continued roll out of ER/GPR, on going need for fisher awareness of spatial restrictions/ regulations, development of Fisheries Compliance Services Operating Standards and drafted guide lines for greenweight reporting produced by DWG.

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 2019/20 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: • One application for a vessel specific conversion factor certificate was received; • Two special permits pertinent to deepwater fisheries were issued: ORH7B acoustic biomass survey (June 2020) and MHS inshore comparative gear trials in the hoki fishery North Island from 18/5/20 to 30/11/20.

2.4 IMPLEMENTATION OF THE NATIONAL PLAN OF ACTION – SEABIRDS (2020)

The NPOA-Seabirds (2013) set out objectives to guide management of interactions with seabirds in New Zealand fisheries.

In May 2020 ministers agreed a new 2020 NPOA- Seabirds. The new objectives will be 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 2019/20 AOP.

The management of fishing impact on seabirds 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)[27] 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*)[28] 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 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. 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. As a result of this, 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.[29] 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[30], 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.

[27] Previously referred to as the number of annual potential fatalities (APFs)
[28] The maximum population size of a species that can be sustained in a specific environment, given available resources such as food and habitat
[29] https://www.mpi.govt.nz/dmsdocument/39407/direct
[30] https://www.mpi.govt.nz/dmsdocument/11662-aebr-165-2014-demographic-assessment-of-the-snares-islands-population-of-southern-bullers-albatross-diomedea-bulleri-bulleri

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,[31] 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.

2.4.2 CAPTURE RATE REDUCTION TARGETS

Capture rate reduction targets provided a gauge against which the Practical Objective of the NPOA-Seabirds (2013) could be measured. In 2015, 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[32]) of observer coverage and estimated capture rates for deepwater fisheries groupings.[33] 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.

[31] Principally silver warehou and barracouta target trawl fisheries.
[32] Data from the 2015/16 to 2017/18 fishing years are used as estimated capture data for the 2018/19 or 2019/20 fishing years are not currently available.
[33] 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.[34]

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 2019/20 the DWG ELO visited 7 of the 11 scampi vessels. Observer coverage of 12% of effort in 2019/20.
Deepwater trawl[35]	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)[36]	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 2019/20 the DWG ELO visited 19 of the 24 manual bottom longliners which landed >2 t of LIN during 2019/20. Observer overage of 5% of effort in 2019/20.[37]

[34] Data from the 2015/16 to 2017/18 fishing years are used in this table as estimated capture data for the 2018/19 or 2019/20 fishing years are not currently available.
[35] Deepwater trawl includes orange roughy and oreo species.
[36] 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.
[37] 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;[38]
- 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 2019/20, 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 2019/20. 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 2019/20 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.

[38] 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 2019/20:

- Work with the Deepwater Group Environmental Liaison Officer to continually improve the VMP and Ling Bottom Longline Operational Procedures (BLL OP) processes, and improve awareness amongst operators of times and areas where the risk of seabird interactions is increased;
- Facilitate the Deepwater Group Environmental Liaison Officer to apply VMP-type processes across the hoki coastal trawl fleet (develop protected species risk management plans consistent with Mitigation Standards and observer audit process);
- Audit all VMPs and equivalent plans against Mitigation Standards and review education programmes to ensure all measures are as effective as possible;
- Monitor / continue to monitor adherence to VMPs and risk management plans. The goal is:
    a) 100% of observed deepwater trips have audited VMP/BILL OP
    b) 95% of observers debriefed by Deepwater Team
    c) Follow up all non-adherence (undertaken by Deepwater Group Environmental Liaison Officer); 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 2019/20:

- Of the 175 observed deepwater trips during the 2019/20 fishing year,[39] the Deepwater Fisheries Management team either debriefed the observers or reviewed the relevant material,[40] after 169 trips (97%). Due to the impacts of COVID-19 in 2019/20 debriefs in person became less frequent. The Deepwater Team began to conduct more phone call debriefs with observers.
- 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 167 such trips with follow up (corrective) actions initiated after 18 trips;
- Observers audited the VMPs of all trawl vessels >28 m that regularly target deepwater species (31 vessels) and 9 of the 12 trawl vessels used to target scampi during the 2019/20 fishing year;
- During the 2019/20 fishing year, observers audited vessel adherence to the Ling Bottom Longline Operational Procedures of three longline vessels >34 m in length and six longline vessels <34 m in length (60% of all relevant BLL vessels). Collectively, those vessels audited against the Ling Bottom Longline Operational Procedures were responsible for 74% of longline effort (hooks) used to target ling in LIN 3 – LIN 7;
- Observers audited vessel adherence to the Hoki Coastal Trawl Operational Procedures of six vessels <28 m in length used to target hoki in the Cook Strait or West Coast South Island 'inside the line' fisheries (43% of <28 m vessels used to target hoki in these areas); and
- During 2019/20 the DWG ELO visited 70 vessels including 24 factory trawlers, five large fresher trawlers (>28 m), 10 hoki-season fresh trawlers (<28 m), seven scampi trawl vessels, five ling auto bottom longliners and 19 of the 24 manual baiting bottom longliners that landed >2 t of LIN during the 2019/20. During vessel visits, the DWG ELO trains/refreshes vessel managers and senior crew to promote best practice mitigation standard practices across the fleet, as codified

[39] 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.

[40] All observers were debriefed by Observer Services at the end of the trip with all relevant material made available to the Deepwater Fisheries Management team where the team was unable to complete a separate debrief.

in VMPs and Operational Procedures. ELO vessel visits were impacted by COVID-19, briefings would often occur as a one-on-one with the vessel manager depending on COVID-19 alert levels;

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 2019/20

- 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 2019/20:

- The Deepwater Fisheries Management team participated in a Southern Seabirds Solutions Trust facilitated net capture workshop held in July in Nelson. Following the workshop, the Deepwater Fisheries Management team contributed to further developing ideas and identifying the primary factors contributing to net captures in deep water trawl fisheries;
- The project assessing the risk factors that influence the rate of seabird net captures on deepwater trawl vessels is ongoing; and
- The Deepwater Fisheries Management team continued to engage in DOC and Fisheries New Zealand research planning and review processes and contributed to three SAG meetings.
- The Deepwater Fisheries Management team contributed to the Fisheries New Zealand research planning as well as DOC's CSP research planning.

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 2019/20 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 non-target species;
- To assess fishery performance against environmental benchmarks as available; and
- To enable more timely 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 2019/20 OBSERVER COVERAGE PERFORMANCE

In 2019/20, 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 2019/20 AOP.

In 2019/20, 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);
- COVID-19 restricted the southern blue whiting fishery resulting in a shortage of sea day coverage by observers.
- 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 2019/20 financial year is summarised in Table 7. Table 8 shows the level of observer coverage within each fishery complex for the 2019/20 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 2018/19 and 2019/20 fishing years. Table 9 also provides information on how the level of observer sampling conducted during the 2018/19 and 2019/20 fishing years compared to sampling targets as defined in the 2018/19 and 2019/20 AOPs. This report provides the opportunity for review of performance against those targets.

Table 7: Comparison of planned and achieved observer coverage for the 2019/20 financial year. Figures for 2019/20 exclude '*training days*' so are not directly comparable to those from previous years.

Fishery complex	Target stocks	Total days planned	Total days delivered	Percent delivered
North Island deepwater	ORH 1, ORH 2A, ORH 2B, ORH 3A, BYX 2 & CDL 2	100	**76**	76%
Chatham Rise deepwater	ORH 3B, OEO 3A, OEO 4 & BYX 3	300	**266**	89%
Sub-Antarctic deepwater	ORH 3B, OEO 1 & OEO 6	80	**40**	50%
West Coast deepwater	ORH 7A	100	**45**	45%
West Coast North Island	JMA 7, EMA 7 & BAR 7	250	**519**	208%
West Coast South Island (FMA 7)	HOK 1, HAK 7, LIN 7 & SWA 1	650	**695**	107%
WCSI HOK 'inside the line'	HOK 1	150	**161**	107%
Cook Strait HOK	HOK 1	150	**152**	101%
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	650	**834**	128%
Sub-Antarctic middle-depth exc. SQU/SBW (FMA5/FMA6)	HOK1, SWA 4, WWA 5B, BAR 5 & JMA 3	500	**582**	116%
Southern blue whiting	SBW (all)	400	**511**	128%
Squid	SQU 1T & SQU 6T	1,250	**2,304**	184%
Bottom longline	LIN 3 – LIN 7	400	**320**	80%
Scampi	Scampi (all)	450	**288**	64%
Total		**5,470**	**6,793**	**125%**

Table 8: Percent observer coverage obtained within deepwater fisheries during the 2019/20 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		1,187	210	18%
	Orange roughy target		777	161	21%
Chatham Rise deepwater	ORH 3B, OEO 3A, OEO 4 & BYX 3		2,502	688	27%
	Orange roughy target		1,516	561	37%
	ORH 3B	NW Rise	82	67	82%
		E&S Rise	1332	373	28%
Sub-Antarctic deepwater	ORH 3B, OEO 1 & OEO 6		306	129	42%
	Orange roughy target		107	46	43%
West Coast deepwater	ORH 7A		510	154	30%
Hoki and middle-depth trawl[41]					
West Coast North Island	JMA 7, EMA 7 & BAR 7		1,040	918	88%
West Coast South Island (FMA 7)	HOK 1, HAK 7, LIN 7 & SWA 1		1,908	1,831	96%
WCSI HOK 'inside the line'	HOK 1		1,316	287	22%
Cook Strait HOK[42]	HOK 1		1,057	233	22%
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		3,865	1,833	47%
	Hoki target		3,065	1,351	44%
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		2,743	1,076	39%
	Hoki target		808	455	56%
Southern blue whiting	SBW (all)		348	348	100%
Squid	SQU 1T & SQU 6T		5,213	4,146	80%
	SQU 6T target		1,797	1,630	91%
Deepwater bottom longline					
Bottom longline[43]	LIN 3 – LIN 7	<34 m	5,197,016	283,950	5%
		>34 m	14,016,017	2,987,673	21%
Scampi trawl					
Scampi	Scampi (all)		4,562	528	12%
	SCI 6A only		1,409	320	23%

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

[42] Defined as statistical areas 016 and 017.

[43] 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 2018/19 and 2019/20 fishing years for Tier 1 deepwater species by area. Ticks or crosses indicate whether sampling targets (as set out in the 2019/20 and 2019/20 AOPs) were met.

Species		Area/method		Number of length frequency samples				Number of fish measured		Number of otoliths collected			
				2018/19		2019/20		2018/19	2019/20	2019/18		2019/20	
Jack mackerel	*Trachurus declivis*	JMD 3		61	-	**46**	-	1,770	**872**	302	-	**271**	-
		JMD 7		388	✓	**372**	✓	32,113	**32,234**	2,311	✓	**2,996**	✓
	Trachurus murphyi	JMM 3		105	-	**74**	-	3,415	**4,575**	531	-	**441**	-
		JMM 7		164	×	**92**	×	2,031	**1471**	596	×	**467**	×
	Trachurus novaezelandiae	JMN 3		-	-	**4**	-	-	**111**	-	-	**20**	-
		JMN 7		244	✓	**276**	✓	18,661	**21,909**	970	✓	**1,759**	✓
Ling		LIN	BLL	77	✓	**55**	✓	867	**715**	458	✓	**250**	×
		3 & 4	Trawl	155		**157**		2,919	**2,969**	770		**792**	
		LIN	BLL	20	✓	**108**	✓	210	**1,287**	100	✓	**235**	✓
		5 & 6	Trawl	288		**218**		12,634	**11,035**	1,471		**1,211**	
		LIN 7		202	✓	**307**	✓	4,507	**4,129**	1,301	✓	**876**	×
		LIN Cook Strait		30	-	**19**	-	443	**241**	100	-	**47**	-
Hake		HAK 1		43	×	**70**	×	1,379	**2,083**	197	×	**345**	×
		HAK 4		11	×	**21**	×	151	**500**	59	×	**121**	×
		HAK 7		157	×	**204**	✓	3,209	**7,279**	801	×	**1,116**	×
Hoki		Sub-Antarctic[44]		330	×	**402**	×	18,935	**23,276**	2,504	✓	**2,684**	✓
		Chatham Rise		419	✓	**505**	✓	38,822	**48,803**	4,014	✓	**5,312**	✓
		WCSI	>46 m	522	✓	**624**	✓	52,515	**57,594**	5,060	✓	**6,259**	✓
			<46 m	99	×	**155**	×	8,767	**16,260**	1,000	✓	**1,075**	✓
		Cook Strait		99	×	**70**	×	10,546	**5,915**	991	×	**687**	×
		ECNI		20	-	**143**	-	1,556	**12,443**	-	-	**665**	-

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

Orange roughy		ORH 1	A = -	×	**A= 1**	×	A = -	**A= 30**	A = -	**-**	**20**	-
			B = 12	×	**B = 15**	×	B = 553	**B = 866**	B = 129	**-**	**85**	-
			C = -	×	**C = -**	×	C = -	**C = -**	C = -	**-**	**-**	-
			D = 1	×	**D = -**	×	D = 11	**D = -**	D = 5	**-**	**-**	-
			Total = 13		**Total=16**		Total = 564	**Total= 896**	Total = 134		**105**	
		ORH 2A (North)	4	-	**2**	-	178	**99**	56	**-**	**15**	-
		ORH 2A (South)	9	-	**2**	-	275	**40**	74	**-**	**24**	-
		ORH 3B (NW Chatham Rise)	21	×	**19**	×	932	**794**	274	×	**95**	×
		ORH 3B (E&S Chatham Rise)	78	✓	**61**	✓	5,024	**4,018**	1,314	✓	**976**	✓
		ORH 3B (Sub-Ant & Puysegur)	19	×	**3**	×	1,181	**260**	309	✓	**40**	×
		ORH 7A & Westpac Bank	30	×	**40**	×	2,170	**2,629**	310	✓	**527**	✓
Oreo	Black	BOE 1	1	-	**-**	-	20	**-**	15	**-**	**-**	**-**
		BOE 3A	37	✓	**9**	×	2,268	**278**	288	×	**49**	×
		BOE 4	6	-	**13**	-	522	**388**	53	**-**	**73**	**-**
		BOE 6	19	-	**3**	-	1,596	**260**	178	**-**	**29**	**-**
	Smooth	SSO 1	46	-	**-**	-	3,140	**-**	338	**-**	**-**	**-**
		SSO 3A	41	✓	**14**	×	3,232	**967**	358	**-**	**101**	**-**
		SSO 4	52	✓	**38**	×	2,959	**2554**	355	✓	**305**	✓
		SSO 6	-	-	**6**	-	-	**120**	-	**-**	**25**	**-**
	Spiky	SOR 3A	1	-	**-**	-	20	**-**	5	**-**	**-**	**-**
		SOR 4	4	-	**2**	-	80	**40**	20	**-**	**5**	**-**
Scampi		SCI 1	55	✓	**53**	✓	2,927	**3112**	N/A			
		SCI 2	4	×	**29**	×	200	**1969**				
		SCI 3	142	✓	**-**	×	16,473	**-**				
		SCI 4A	21	×	**21**	×	2,683	**1054**				

	SCI 6A	274	✓	**213**	✓	19,092	**18,757**				
Southern blue whiting	SBW 1	-	-	**3**	-	-	**60**	-	-	**15**	-
	SBW 6I	263	✓	**164**	✓	**40,414**	**24,585**	**3,941**	✓	**2,653**	✓
	SBW 6B	8	×	**10**	×	**1,384**	**1,500**	**216**	×	**194**	×
	SBW 6R	58	-	**15**	-	**7,717**	**372**	**995**	-	**85**	-
	SBW 6A	13	-	**26**	-	**251**	**512**	**64**	-	**166**	-
Squid (all species combined)	SQU 1T	1,252	-	-	-	**129,373**		N/A			
	SQU 6T	421	-	-	-	**44,350**					

Table 10: Numbers of length frequency samples and otoliths collected by observers during the 2018/19 and 2019/20 fishing years for Tier 2 deepwater stocks

Species	QMA	Number of length frequency samples		Number of fish measured		Pairs of otoliths collected	
		2018/19	2019/20	2018/19	2019/20	2018/19	2019/20
Barracouta	BAR 4	44	**74**	2,815	**4,817**	358	**396**
	BAR 5	356	**528**	13,848	**22,710**	1,943	**2,366**
	BAR 7	236	**278**	8,017	**10,566**	1,217	**1,394**
Alfonsino	BYX 1	1	-	20	-	5	-
	BYX 2	2	-	35	-	10	-
	BYX 3	21	-	971	-	110	-
	BYX 7	1	-	20	-	5	-
Cardinal fish	CDL 2	1	**2**	20	**128**	5	**10**
	CDL 3	-	**6**	-	**271**	-	**30**
	CDL 5	1	-	100	-	5	-
Blue (English) mackerel	EMA 3	2	**3**	40	**41**	12	**10**
	EMA 7	145	**127**	4,185	**3,033**	727	**653**
Frostfish	FRO 3 & 4	2	**1**	30	**20**	10	**5**
	FRO 5	-	-	-	-	-	-
	FRO 7 - 9	227	**118**	5,372	**2,413**	1,119	**580**
Giant spider crab	GSC 3	1	**9**	20	**182**	N/A	
	GSC 5	44	**105**	1,043	**2086**		
	GSC 6A	113	**229**	1,987	**4,662**		

Species	QMA	Number of length frequency samples		Number of fish measured		Pairs of otoliths collected	
		2018/19	2019/20	2018/19	2019/20	2018/19	2019/20
	GSC 6B	2	**2**	41	**40**		
Dark ghost shark	GSH 4	12	**1**	309	**20**	N/A	
	GSH 5	7	**4**	290	**81**		
	GSH 6	5	**3**	100	**62**		
Pale ghost shark	GSP 1	16	**51**	311	**979**	N/A	
	GSP 5	1	**11**	12	**207**		
	GSP 7	1	**-**	9	**-**		
Lookdown dory	LDO 1	4	**4**	80	**65**	10	**-**
	LDO 3	2	**14**	40	**277**	-	**-**
Prawn killer	PRK 1	14	**-**	278	**-**	N/A	
Patagonian toothfish	PTO 1	-	**-**	-	**-**	-	**-**
Redbait	RBT 3	43	**52**	2,084	**1,565**	212	**245**
	RBT 7	8	**2**	101	**43**	16	**9**
Rubyfish	All	5	**4**	170	**24**	20	**5**
Ribaldo	RIB 3 & 4	34	**8**	601	**165**	155	**29**
	RIB 5 & 6	-	**1**	-	**20**	-	**5**
	RIB 7	2	**10**	40	**176**	8	**44**
Gemfish	SKI 3	126	**102**	2,634	**1,474**	604	**462**
	SKI 7	89	**160**	1,632	**3,107**	446	**769**
Spiny dogfish	SPD 4	2	**-**	40	**-**	N/A	
	SPD 5	13	**-**	334	**-**		
Sea perch	SPE 3	3	**18**	60	**360**	14	**86**
	SPE 4	35	**17**	604	**330**	174	**82**
	SPE 5	-	**5**	-	**78**	-	**14**
	SPE 7	3	**-**	45	**-**	10	**-**
Silver warehou	SWA 1	24	**29**	901	**750**	120	**141**
	SWA 3	217	**195**	6,176	**6,157**	1,083	**1026**
	SWA 4	517	**277**	13,026	**7,859**	2,532	**232**
White warehou	WWA 3 & 4	9	**13**	156	**256**	51	**63**
	WWA 5B	35	**18**	1,792	**940**	186	**98**
	WWA 7	-	**1**	-	**20**	-	**5**

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 Fisheries New Zealand Fisheries Research Services. 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 2019/20 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 2019/20 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 publicly 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 2019/20 financial year and current status (as of January 2020). Table 11 also includes deepwater fisheries research projects from 2018/19 that were planned to be initiated in 2019/20.

Project code	Title	Status
HAK2019-01	Stock assessment of hake in HAK4	complete
HOK2019-01	Estimation of spawning hoki biomass in Cook Strait using acoustic surveys	complete
HOK2019-02	Land based catch sampling of hoki	complete
HOK2019-03	Stock assessment of hoki in HOK1	in progress
LIN2019-03	Stock assessment of ling in LIN7	complete
MID2019-02	Routine age determination of middle depth and deepwater species from commercial fisheries and resource surveys	in progress
ORH2019-02	Estimation of the abundance of orange roughy using acoustic surveys (ORH3B Northwest Rise and East and South Chatham Rise)	cancelled
SBW2019-01	Biomass estimation of the Campbell Island southern blue whiting stock using acoustic surveys	complete
SBW2019-03	Stock assessment of southern blue whiting in SBW6I	in progress
SCI2019-01	Estimation of the abundance of scampi in SCI3 using photographic surveys	in progress
SCI2019-02	Stock assessment of scampi in SCI6A	in progress

Project code	Title	Status
BAR2017-02	Update of abundance indices for BAR 4 & 7	complete
DAE2018-01	Catch composition in deepwater fisheries (this is a multi-year project that will look at the JMA trawl fishery in 2019/20)	in progress[45]
DAE2018-04	Taxonomic identification of benthic samples	in progress
DEE2017-01	Stock assessment of blue mackerel	in progress
JMA2017-01	Stock assessment of jack mackerel in JMA7	complete
MID2018-01	Estimation of hoki and middle depth fish abundance using trawl surveys (this is a multi-year project, the trawl survey scheduled for 2019/20 is the Chatham Rise trawl survey, which will commence in Jan 2020)	survey complete
OEO2018-02	Development of an approach for monitoring oreos in OEO3A	cancelled
SBW2018-01	Estimation of southern blue whiting biomass using acoustic methods (Bounties Platform)	complete
SCI2017-03	Evaluation of potential management strategies for scampi	in progress
SCI2017-04	Characterisation and CPUE of scampi in SCI4	complete
SQU2017-01	Stock assessment of arrow squid	cancelled

Table 12: Aquatic Environment and Biodiversity research planned for the 2019/20 financial year and current status. Table 12 only includes ongoing Aquatic Environment and Biodiversity research projects relevant to deepwater fisheries.

Project code	Title	Status
BEN2019-01	Monitor the extent and intensity of bottom contact by trawl and dredge fishing in the Territorial Sea and Exclusive Economic Zone	in progress
BEN2019-04	A spatially explicit benthic impact assessment for inshore and deepwater fisheries in New Zealand	in progress
BEN2019-05	Towards development of a spatial decision support tool development for managing the impacts of bottom fishing on in-zone, particularly vulnerable or sensitive habitats.	in progress
PMM2019-10	Update Campbell Island New Zealand sea lion Population Sustainability Threshold estimation	Draft

[45] JMA bycatch work behind schedule

PRO2019-01	Preparation and documentation of a standardised linked dataset -- including commercial effort reporting, fisheries observer data, and protected species captures	Draft
PRO2019-02	Maintenance of PSC (protected species captures) website displaying updated observed commercial fisheries captures, and total estimated captures for selected species	in progress
PRO2019-09	Spatial distribution modelling of at-risk seabirds in New Zealand commercial fisheries	in progress
PRO2019-10	Refine spatially explicit fisheries risk assessment (SEFRA) model parameterisation for at-risk protected species	in progress
PSB2019-01	Estimation of total captures of seabirds using standardised estimation methods	in progress
PSB2019-02	Distributional study of Antipodean Albatross using satellite reporting GPS tags	in progress
PSB2019-04	Black petrel population monitoring and distribution study	in progress
PSB2019-09	Aerial survey of white-capped albatross on the Auckland Islands	in progress
SAM2019-02	Development of imaging analysis technology to determine ages from otoliths	in progress
ZBD2019-01	Quantifying benthic biodiversity part 2	in progress
ZBD2019-04	Plastics and marine debris across the ocean floor in New Zealand waters	in progress
ZBD2019-11	Development of Electronic Automated Reporting System (EARS) to improve seabird bycatch monitoring	in progress

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

Project code	Title	Status
PMM2018-07	Updated spatially explicit fisheries risk assessment for New Zealand marine mammal populations	in progress
PMM2018-08	Update SEFRA risk assessment tool - build observer coverage/digital monitoring optimisation function	cancelled
PSB2018-10	Deepwater net capture analysis	in progress

Project code	Title	Status
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: Mainland and Stewart Island NZ sea lions	in progress
PRO2017-01B	Research into the demographic parameters for at-risk seabirds as identified by the RA (Southern Buller's/Snares)	complete

3.2.1 RESEARCH REPORTS

Final research reports from previously contracted work that were published in the 2019/20 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 2019/20 financial year of relevance to deepwater fisheries.

Annual documents	
2020 May Plenary	Fisheries New Zealand (2020). Fisheries Assessment Plenary, May 2020: stock assessments and stock status. Volume 1: Introduction and covers alfonsino to hake. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
	Fisheries New Zealand (2020). Fisheries Assessment Plenary, May 2020: stock assessments and stock status. Volume 2 covers hoki to redbait. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
	Fisheries New Zealand (2020). Fisheries Assessment Plenary, May 2020: stock assessments and stock status. Volume 3 covers red cod to yellow-eyed mullet. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1655 p.
2019-20 AEBAR	Ministry for Primary Industries (2020) Aquatic Environment and Biodiversity Annual Review 2019-20. Compiled by the Fisheries Science Team, Ministry for Primary Industries, Wellington, New Zealand. 765 p.
Aquatic Environment and Biodiversity Reports (AEBRs)	
241	Finucci, B.; Anderson, O.F.; Edwards, C.T.T. (2020). Non-target fish and invertebrate catch and discards in New Zealand ling longline fisheries from 2002–03 to 2017–18.
240	Stephenson, F.; Goetz, K.; Mouton, T.; Beets, F.; Hailes, S.; Roberts, J.; Pinkerton, M.; MacDiarmid A. (2020). Spatial distribution modelling of New Zealand cetacean species.
239	Bowden, D.A.; Rowden, A.A.; Chin, C.; Hempel, S.; Wood, B.; Hart, A.; Clark, M.R. (2020). Best practice in seabed image analysis for determining taxa, habitat, or substrata distributions.
237	Richard,Y.;Abraham,E.; Berkenbusch,K.(2020).Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–07to2016–17.
234	Abraham,E.R.; Berkenbusch,K.(2019). Preparation of data for protected species capture estimation, up dated to 2017–18.
232	Nelson, W.A.; Twist, B.A.; Neill, K.F.; Sutherland, J.E. (2019). Coralline algae of New Zealand: a summary of recent research and the current state of knowledge.

231	Thompson, D.R.; Sagar, P.M. (2019). Population studies of southern Buller's albatrosses on The Snares
229	Baird, S.J.; Mules, R. (2019). Extent of bottom contact by New Zealand commercial trawl fishing for deepwater Tier 1 and Tier 2 target species determined using Catch Mapper software, fishing years 2008–17.
228	Thompson, D.R. (2019). Data collection of demographic, distributional and trophic information on selected seabird species to allow estimation of effects of fishing on population viability: synthesis of population and demographic work.
227	Clark, M.R.; Mills, S.; Leduc, D.; Anderson, O.F.; Rowden, A.A. (2019). Biodiversity of Benthic Protection Areas and Seamount Closure Areas: a description of available benthic invertebrate data, and a preliminary evaluation of the effectiveness of BPAs for biodiversity protection.
226	Abraham, E.R.; Richard, Y. (2019). Estimated capture of seabirds in New Zealand trawl and longline fisheries to2016–17. New Zealand Aquatic Environment and Biodiversity Report No. 226. 85p.
225	Middleton, D.A.J. (2019). Simulating sea lion dives to assess the probability of post-exit drowning for sea lions exiting SLEDs.
224	Large, K.; Roberts, J.; Francis, M.; Webber, D.N. (2019). Spatial assessment of fisheries risk for New Zealand sea lions at the Auckland Islands.
222	Meyer, S. (2019). Desktop estimation of New Zealand sea lion cryptic mortality in trawls using SLEDs.
221	Bowden, D.A.; Rowden A.A.; Anderson O.F.; Clark, M.R.; Hart, A.; Davey, N.; Carter, M.; Chin, C. (2019). Quantifying benthic diversity: developing a dataset of benthic invertebrate faunal distributions from seabed photographic surveys of Chatham Rise.
220	Anderson, O.F.; Edwards, C.T.T.; Ballara (2019). Non-target fish and invertebrate catch and discards in New Zealand hoki, hake, ling, silver warehou, and white warehou trawl fisheries from 1990–91 to 2016–17.
218	Graham, B.S.; Bury, S.J. (2019). Marine isoscapes for trophic and animal movement studies in the southwest Pacific Ocean.
Fisheries Assessment Reports (FARs)	
2019-19 MID2018-02	O'Driscoll, R.L.; Ballara, S.L. (2019). Trawl and acoustic survey of hoki and middle depth fish abundance on the west coast South Island, July–August 2018
2020-13 SCI2019-02	Tuck, I.D.; Parkinson, D.; Armiger, H.; Smith, M.; Miller, A.; Drury, J.; Spong, K. (2020). Estimating the abundance of scampi in SCI 6A (Auckland Islands) in 2019.
2020-10 ORH2017-01	Ryan, T.; Downie, R.; Tilney, R. (2020). Biomass surveys of orange roughy spawning aggregations in Mid-East Coast (ORH 2A South) in June 2017 using a net attached acoustic optical system.
2020-07	Horn, P.L.; Ó Maolagáin, C. (2020). Age determination protocols for jack mackerels (*Trachurus* spp.) in New Zealand waters.
2020-06 SCI2018-01	Tuck, I.D. (2020). Characterisation and length-based population model for scampi (*Metanephrops challengeri*) in the Bay of Plenty (SCI 1) and Hawke Bay–Wairarapa (SCI 2).
2020-04 SCI2017-04	Tuck, I.D. (2020). Characterisation and CPUE standardisation of scampi in SCI 4A.
2020-03	Langley, A.D. (2020). Fishery characterisation, CPUE analysis and preliminary modelling of gemfish in SKI 3 and SKI 7.
2019-71	MacGibbon, D.J.; Ballara, S.L.; Schimel, A.C.G.; O'Driscoll, R.L. (2019). Trawl survey of hoki and middle depth species in the Southland and Sub-Antarctic, November–December 2018 (TAN1811).
2019-70	Holmes, S.J. (2019). Stock assessment of ling (*Genypterus blacodes*) on the Chatham Rise (LIN 3&4) for the 2018-19 fishing year.

2019-68 HOK2018-01	McKenzie, A. (2019). Assessment of hoki (*Macruronus novaezelandiae*) in 2019
2019-67 ORH2018-02	Dutilloy, A.; Horn, P.L.; Ó Maolagáin, C. (2019). Age composition of orange roughy on the southwest Challenger Plateau (ORH 7A) and Westpac Bank in 2018.
2019-66 HAK2018-01	Kienzle M.; McGregor, V.; Dunn, M.R. (2019). Stock assessment of hake (*Merluccius australis*) on the west coast of South Island (HAK 7) for the 2018–19 fishing year.
2019-63 MID2017-01	Horn, P.L.; Sutton, C.P. (2019). Catch-at-age for hake (*Merluccius australis*) and ling (*Genypterus blacodes*) in the 2017–18 fishing year and from research trawl surveys in 2018, with a summary of all available data sets from the New Zealand EEZ.
2019-62 SCI2017-02	Tuck, I.D. (2019). Characterisation and a length-based assessment model for scampi (*Metanephrops challengeri*) on the Mernoo Bank (SCI 3).
2019-60 DEE2016-16	McGregor, V.L. (2019). Silver warehou (*Seriolella punctata*) western Chatham Rise preliminary stock assessment.
2019-59	McGregor,V.L.(2019). Fishery characterisation and standardised CPUE analyses for silver warehou (*Seriolella punctata*) in SWA3 and 4,1989–90to2015–16.
2019-55	Finucci, B. (2019). Descriptive analysis and a catch-per-unit-effort (CPUE) analysis of the West Coast South Island (HAK 7) fishery for hake (*Merluccius australis*).
2019-53 LIN2018-01	Dutilloy, A. (2019). A descriptive analysis of all ling (*Genypterus blacodes*) fisheries, and CPUE for ling longline fisheries for LIN 3&4 from 1990 to 2018.
2019-52 HAK2017-01	Dunn, M.R. (2019). Stock assessment of Sub-Antarctic hake (part of HAK 1) for 2018.
2019-49 LIN2017-01	Ballara, S.L. (2019). A descriptive analysis of all ling (*Genypterus blacodes*) fisheries, and CPUE for ling fisheries in LIN 5&6, from 1990 to 2017
2019-48 HOK2018-01	Ballara, S.L.; O'Driscoll, R.L. (2019). Catches, size, and age structure of the 2017–18 hoki fishery, and a summary of input data used for the 2019 stock assessment.
2019-44 SBW2019-01	Roberts, J.; Hanchet, S.M. (2019). Southern blue whiting (*Micromesistius australis*) stock assessment for the Campbell Island Rise for 2017
2019-43 JMA2017-01	Horn, P.L.; Ó Maolagáin, C.; Hulston, D. (2019). Commercial catch sampling for species proportion, sex, length, and age of jack mackerels in JMA 7 in the 2017–18 fishing year, with a summary of all available data sets.
2019-40 LIN2019-03	Dunn, M.R.; Ballara, S.L. (2019). Fishery description and stock assessment for ling off the West Coast South Island (LIN 7) to the 2015–16 fishing year.
2019-33 ORH2018-02	Cordue, P.L. (2019). A 2019 stock assessment of ORH 7A including Westpac Bank.
2019-30 LIN2017-01	Masi, M. (2019). Stock assessment of ling (*Genypterus blacodes*) in the Sub-Antarctic (LIN 5&6) for the 2017–18 fishing year.
2019-29	Horn, P.L.; Ó Maolagáin, C. (2019). A comparison of age data of orange roughy (*Hoplostethus atlanticus*) from the central Louisville Seamount Chain in 1995 and 2013–15.
2019-28 DEE2016-06	Cordue, P.L. (2019). A 2018 stock assessment of smooth oreo in OEO 4.
2019-27 DEE2017-01	Horn, P.L.; Ó Maolagáin, C. (2019). The length and age composition of the commercial trawl catch of blue mackerel (*Scomber australasicus*) in EMA 7 during the 2017–18 fishing year, with a summary of all available data sets.
2019-22	McKenzie, A. (2019). Assessment of hoki (*Macruronus novaezelandiae*) in 2018.

HOK2017-03	
2019-20 DEE2016-21	Cordue, P.L. (2019). A 2017 stock assessment of ORH 3B Puysegur.
2019-18 SCI2017-01	Tuck, I.D.; Parkinson, D.; Armiger, H.; Smith, M.; Miller, A.; Rush, N.; Spong, K. (2019). Estimating the abundance of scampi in SCI 1 (Bay of Plenty) and SCI 2 (Wairarapa / Hawke Bay) in 2018.
Conservation Services Programme (Department of Conservation) reports	
POP2017-04	Rexer-Huber K., Elliott G., Walker K., Thompson D., Parker G.C. 2020. Gibson's albatross and whitecapped albatross in the Auckland Islands 2019–20. Final report to the Conservation Services Programme, Department of Conservation. Parker Conservation, Dunedin. 30 p.
BCBC2018-01	Goad, D., Kellian, D. and Kiddie, B. 2020. Development of underwater line setters for bottom longlines. BCBC2018-01 final report for the Conservation Services Programme, Department of Conservation. 41 p
POP2019-04	Thompson, D. & Sagar, P. 2020. Southern Buller's albatross, Snares Island/Tini Heke population project 2019/20. POP2019-04 final annual report prepared by NIWA for the Conservation Services Programme, Department of Conservation. 24 p
POP2017-03	Thompson, D., Sagar, P., Briscoe. D., Parker, G., Rexer-Huber, K. and Charteris, M. 2020. Salvin's albatross Bounty Islands population project. POP2017-03 final report prepared by NIWA for the Conservation Services Programme, Department of Conservation. 23 p.
MIT2019-02	Eayrs, S., Craig, T. and Short, K. 2020. Review of mitigation techniques to reduce benthic impacts of trawling. MIT2019-02 final report prepared by Terra Moana Limited for the Conservation Services Programme, Department of Conservation. 135 p.
POP2018-01	Anderson, O., Stevenson, F. Behrens, E. 2020. Improved habitat suitability modelling for protected corals in New Zealand waters. POP2018-01 final report prepared by NIWA for the Conservation Services Programme, Department of Conservation. 108 p.
POP2018-03	Melidonis, M.C. and Childerhouse, S. 2020. New Zealand Sea Lion (Rāpoka) Monitoring on the Auckland Islands for the 2019/20 Season: Field Research Report. Prepared for the Department of Conservation (DOC). 23p.
POP2019-05	Rexer-Huber K., Parker G.C. 2020. Bounty Islands drone trials: feasibility for population assessment of NZ fur seal. POP2019-05 final report for the Conservation Services Programme, Department of Conservation. Parker Conservation, Dunedin. 18 p
MIT2018-01	Tidswell, P. 2020. Protected species engagement project. Final Report prepared by Port Group for the Conservation Services Programme, Department of Conservation. 16p.
POP2018-05	Waugh, S., Barbraud, C., Delord, K., Simister, K., Baker, G., Hedley G., Wilson, K., Rands, D. 2019. Changes in population density and response to storm damage for Westland petrels 2007 – 2019. Report prepared for the Conservation Services Programme, Department of Conservation.
INT2015-03	Tracey, D., Macpherson, D., Mills, S. (2019). Identification and storage of cold-water coral bycatch specimens: 1 July 2018- 30 June 2019. Final Annual Report prepared by NIWA for the Conservation Services Programme, Department of Conservation. INT2015-03. NIWA Client Report 2019362WN. 39 p.
POP2018-04	Crowe, P.; Bell, M. 2019. Flesh-footed shearwater population monitoring and estimates: 2018/19 season. Report prepared by Wildlife Management International Limited for the New Zealand Department of Conservation, Wellington. 32 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.[46]

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 VI.

Overall, 147 interim trip reports relating to observed trips on deepwater vessels[47] were completed in the 2019/20 financial year (Table 15). Observers answered 87% of questions with a rating of 'A', 2.3% of questions with a rating of 'B', 10.3% of questions with a rating of 'N/A' and less than 1% of questions with a rating of 'C'. Of the 147 interim trip reports completed during the 2019/20 financial year, only three trips had one (or more) of the questions receive a 'C' rating by observers.

Table 15: Summary of interim trip reports where a 'C' rating was given for the 2019/20 financial year.

Factor	Number of 'C' ratings
QMS species are discarded only after correct estimation and authorisation[48]	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[49]	1
Fish is cut in accordance with the Conversion Factors Notice	0
Non-fish by-catch recorded and reported accurately	0
Offal management was adequate (if VMP on board, meets specifications)[50]	0
Appropriate bird mitigation devices were deployed and in working condition for duration of trip	0
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

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

[47] 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.

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

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

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

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 2019/20 fishing year and Figure 3 shows the total amount levied for both deepwater, and all, stocks between the 2006/07 and 2019/20 fishing years. Species specific cost recovery levies are provided in Appendix V.

Table 16: The total levied for the 2019/20 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		5,670,159	13,436,806
Registry		1,676,387	3,972,603
Observers	MPI	2,061,003	3,167,911
	DOC	456,400	510,970
Research	MPI	5,382,962	13,001,319
	DOC	573,118	726,602
Under & Overs	MPI	-559,797	-1,387,178
	DOC	63,035	198,265
Total		**15,323,266**	**33,627,298**

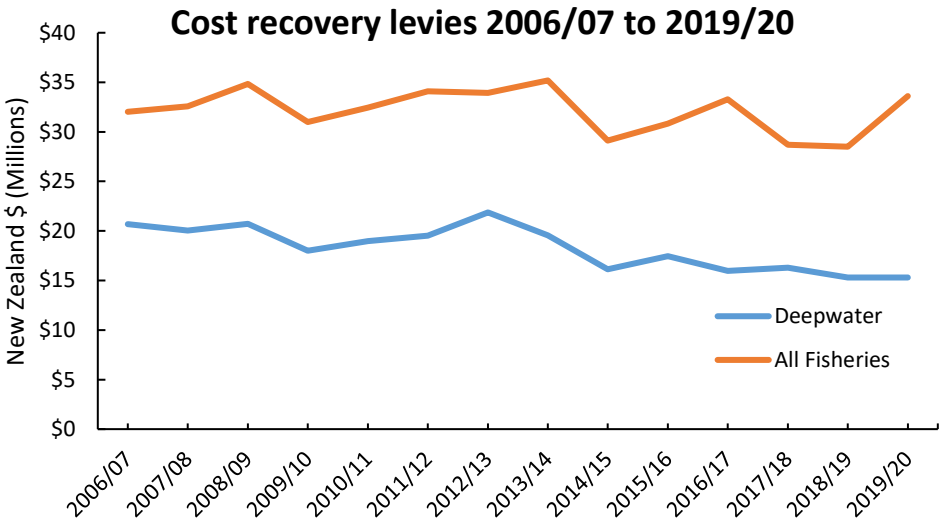

Figure 3: Total amount recovered by cost recovery levies between 2006/07 and 2019/20. Separate totals are shown for deepwater species and all species combined.[51]

[51] The decline in deepwater levies cost recovered from 2013/14 onwards is in part due to 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 2019/20 fishing year. Fisheries-specific environmental interactions are reported in Appendix I. Please note that all 2019/20 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 2019/20 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[52]	159	15	9%
2019/20	146	142	120	18	13%

[52] 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 appropriate 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 2019/20 VMP-related issues that required follow-up by DWG were identified following 18 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 12 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 2019/20 fishing years.

Type of issue	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Administrative	2	0	2	2	2	3
Seabird trigger not reported	2	1	0	2	0	0
Seabird scaring devices	8	5	6	3	2	3
Offal management issues	13	12	13	9	11	12
Total	**25**	**18**	**21**	**16**	**15**	**18**

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 are considered relevant to both VMPs and MMOPs. During the 2019/20 fishing year there were 12 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 2019/20 fishing years.

Type of issue	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
General offal management	7	9	4	6	7	6
Net cleaning/time in water	3	0	1	2	2	4
Floor wash	2	1	4	1	2	2
Breakdown procedures	1	2	4	0	0	0
Total	**13**	**12**	**13**	**9**	**11**	**12**

4.2 BOTTOM LONGLINE OPERATIONAL PROCEDURES

During the 2019/20 fishing year, Fisheries New Zealand observers audited the performance of twelve vessels against the bottom longline operational procedures. Follow up actions were required after six trips in relation to either offal management or 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.[53] 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 2019/20 fishing year.[54]

Table 20: Observed seabird captures for the 2019/20 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		2019/20		
Common name	Species Code	Alive	Dead	Total
Albatrosses (Unidentified)	XAL	6	6	12
Black-browed albatross	XKM	1	-	1
Buller's albatross	XBM	3	12	15
Buller's and Pacific albatross	XPB	2	6	8
Cape petrels	XCP	1	-	1
Common diving petrel	XDP	-	1	1
Great albatrosses	XGA	1	1	2
Grey petrel	XGP	1	2	3
Mid-sized Petrels & Shearwaters	XPM	7	2	9
Petrel (Unidentified)	XPE	2	1	3
Petrels, Prions and Shearwaters	XXP	2	2	4
Procellaria petrels	XPC	15	8	23

[53] 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.

[54] 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.

Royal albatrosses	XRU	1	-	1
Salvin's albatross	XSA	9	41	50
Seabird (unspecified)	UNI	-	2	2
Shearwaters	XSA	-	4	4
Smaller albatrosses	XMA	1	2	3
Sooty shearwater	XSA	4	47	51
Southern royal albatross	XRA	5	1	6
Westland petrel	XWP	-	1	1
White-capped albatross	XWM	26	76	102
White-chinned petrel	XWC	60	174	234
Total		**147**	**389**	**536**

Table 21 summarises the proportion of observed seabird captures released alive on the deepwater trawl fleet between the 2014/15 and 2019/20 fishing years. Table 22 summaries the capture method of observed seabird captures on deepwater trawl vessels between the 2014/15 and 2019/20 fishing years. Table 23 shows industry reported seabird captures between the 2014/15 and 2019/20 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 2019/20 fishing years.

Fishing year	Percentage released alive
2014/15	55%
2015/16	31%
2016/17	25%
2017/18	36%
2018/19	27%
2019/20	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[55]			Warp captures			Other[56]		
	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	-
2019/20	334	141	6	29	-	-	14	4	-

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

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

Table 23: Industry-reported seabird[57] interactions between the 2014/15 and 2019/20 fishing years from the core deepwater fleet.[58]

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**
2019/20	115	216	331	163	441	604	**935**

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 2019/20 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	8,216	3,874	47%	123	3.18
Hake	260	205	79%	2	0.98
Ling (LIN 3 – 7)	1331	341	26%	15	4.40
Squid	5,213	4,146	80%	412	9.94
Southern blue whiting	348	348	100%	12	3.45
Jack mackerel	1,737	1,355	78%	1	0.07
Scampi	4,562	528	12%	9	1.70
Deepwater (ORH/OEO/CDL/BYX)	4612	1476	32%	1	0.07
Barracouta	1054	938	89%	28	2.99
Warehou species	362	212	59%	6	2.83
Total	**27,695**	**13,423**	**48%**	**609**	**-**

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

[58] 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 25: Observed and estimated[59] seabird captures from deepwater ling bottom longline fisheries (LIN 3 – LIN 7) between 2014/15 and 2019/20.

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	-	-
2019/20	19,213,033	3,271,623	17%	57	0.017	-	-

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.

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). Through ER, Fisheries Management can independently monitor trigger points and identify discrepancies between the ER data and what was notified to DWG.

There were nineteen trigger point activations for seabird captures in the 2019/20 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 2015/16 and 2019/20 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		2015/16	2016/17	2017/18	2018/19	2019/20
	Captures in any 24 hr period	Captures in any 7 day period					
Seabirds - large	3 or more	10 or more of any species	8	3	6	6	4
Seabirds - small	5 or more		3	8	7	1	15

[59] Estimated captures for the 2018/19 or 2019/20 year not available at the time of publication.

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 2017/18 and 2019/20 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 2017/18 and 2019/20 fishing years.[60] Observed records involving decomposing carcasses have not been included.

Species	Observed captures						Fisher-reported captures					
	Alive			Dead			Alive			Dead		
	17/18	18/19	19/20	17/18	18/19	19/20	17/18	18/19	19/20	17/18	18/19	19/20
Common dolphin	-	-	-	1	-	-	-	-	-	1	-	5
Dusky dolphin	-	-	-	-	-	2	-	-	-	1	2	2
NZ fur seal	3	7	2	68	56	52	8	12	12	108	81	105
NZ sea lion	1	-	1	6	9	-	2	-	1	7	9	2
Seals and sea lions	-	-	-	-	-	-	-	-	-	1	1	-
Pilot whale	-	-	-	1	-	1	-	-	-	1	-	1
Orca	-	-	-	1	-	-	-	-	-	1	-	-
Baleen whales	-	-	-	-	-	-	-	-	-	-	1	-
Southern right whale	-	-	-	-	-	-	-	-	-	-	-	1

[60] 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.

Table 28: Observed NZ fur seal captures from New Zealand deepwater and middle-depth trawl fisheries for the 2019/20 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	8,216	3,874	47%	18
Hake	260	205	79%	-
Ling (LIN 3 – 7)	1331	341	26%	2
Squid	5,213	4,146	80%	23
Southern blue whiting	348	348	100%	8
Jack mackerel	1,737	1,355	78%	-
Scampi	4,562	528	12%	1
Deepwater (ORH/OEO/CDL/BYX)	4612	1476	32%	-
Barracouta	1054	938	89%	1
Warehou species	362	212	59%	1
Total	**27,695**	**13,423**	**48%**	**54**

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 13 trigger point activations for marine mammal captures during the 2019/20 fishing year. These are summarised in Table 29 below.

Table 29: Marine mammal trigger point activations between the 2015/16 and 2019/20 fishing years.

Species	Trigger Points		2015/16	2016/17	2017/18	2018/19	2019/20
	Captures in any 24 hr period	Captures in any 7 day period					
NZ fur seal	2	5	6	5	6	8	6
Common dolphin	1	-	2	0	1	0	1
NZ sea lion	1	-	3	3	8	9	2
Other marine mammal [61]	1	-	0	1	2[62]	2[63]	4[64]

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

[62] One orca and one unidentified dolphin.

[63] 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.

[64] Four capture events, two involving two dusky dolphins, one involving two unidentified dolphins and one involving a pilot whale

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.[65] The management of sharks in New Zealand is guided by the National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks 2013), which was under review at the time this ARR was published. 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 the objective 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.

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; eleven basking shark triggers were reported during the 2019/20 fishing year. Table 31 shows the number of observed and industry reported protected shark captures in deepwater fisheries between the 2015/16 and 2019/20 fishing years.

[65]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 31: Observed and industry reported captures of protected shark species from the core deepwater fishing fleet between the 2015/16 and 2019/20 fishing years.[66]

Species	Observed Captures					Industry-reported				
	15/16	16/17	17/18	18/19	19/20	15/16	16/17	17/18	18/19	19/20
Basking shark	1	5	1	7	11	5	8	1	7	12
White pointer shark	1	3	5	3	9	1	4	5	3	9

Sharks are classified as: rays and skates, sharks and dogfish, and chimaeras. Within these three classifications, some species are protected, some are managed under 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 2019/20 fishing year.

Table 32: Reported landings of sharks from the core deepwater fishing fleet in 2019/20 (tonnes).

Species	Chimaeras[67]	Rays & Skates	Sharks & Dogfish	Total
Generic reporting code	1	6	230	237
QMS species	1,086	642	3,733	5,461
Other	131	40	1,064	1,235
Total	**1,218**	**688**	**5,027**	**6,933**

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 2015/16 and 2019/20 fishing year (as a percent of total reported shark landings/catches) by the core deepwater fleet.

Year	% industry-reported landings with generic codes	% of observed shark catches with generic codes
2015/16	6%	3%
2016/17	5%	1%
2017/18	3%	1%
2018/19	4%	1%
2019/20	3%	1%

[66] Observed captures and Industry-reported captures 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).

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

Details of QMS shark landings by the core deepwater fleet during 2019/20 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).

Table 34: Details of QMS shark species landed by the core deepwater fleet during the 2019/20 fishing year (tonnes).

Species	Total landings [68]	Landed green	Landed processed (exc MEA)	Mealed	Discarded under observer approval	Returned dead (6TH schedule)	Returned alive (6th schedule)	Accidental loss
Blue shark	4	-	-	<1	<1	4	<1	-
Elephant fish	7	-	5	<1	<1	-	-	-
Ghost shark	445	25	334	43	43	N/A	N/A	<1
Mako shark	15	-	-	<1	<1	12	2	-
Pale ghost shark	659	5	495	151	8	N/A	N/A	<1
Porbeagle shark	18	-	-	-	<1	14	4	-
Rig	17	4	11	2	<1	N/A	N/A	-
Rough skate	245	59	86	80	<1	-	17	
School shark	180	-	139	18	17	-	3	<1
Smooth skate	355	13	232	56	10	-	40	1
Spiny dogfish	3,050	14	108	1,048	1	1,859		20
Total	4,550	120	1,410	1,399	96	29[69]	67[70]	22

[68] 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).

[69] Does not include spiny dogfish returns.

[70] See above.

4.6 TIER 3 SPECIES

Tier 3 species are non-QMS species that are caught during fishing activity. 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.[71]

Table 35: Landings (tonnes) of the top 40 Tier 3 species by the core deepwater fleet between the 2014/15 and 2019/20 fishing year.

Species code	Common name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
RAT	Rattails	3,682	3,630	5,069	4,539	3,758	2,864
JAV	Javelinfish	4,234	4,300	5,366	6,102	3,905	2,554
NCB	Smooth red swimming crab	186	143	491	245	214	326
SDO	Silver dory	231	230	192	295	739	324
OSD	Other sharks and dogfish	189	291	268	248	301	288
SND	Shovelnose dogfish	251	429	377	492	484	247
SSI	Silverside	123	134	169	589	219	213
STU	Slender tuna	235	177	209	628	291	155
SLK	Slickhead	107	115	166	191	127	108
BSH	Seal shark	87	81	139	113	100	92
ETB	Baxter's lantern dogfish	290	253	309	325	297	73
HCO	Hairy conger	63	90	80	53	89	61
CSQ	Leafscale gulper shark	123	178	127	195	161	57
RHY	Common roughy	116	67	64	160	237	55
MOD	Morids	62	63	99	53	23	50
WSQ	Warty squid	89	84	173	140	117	42
HJO	Johnson's cod	20	34	61	55	73	42
FHD	Deepsea flathead	105	99	100	147	106	41
SFI	Starfish	48	73	70	96	85	41
CRB	Crab (unspecified)	37	80	57	68	39	40
CAR	Carpet shark	60	46	48	32	37	40
CDO	Capro dory	58	34	28	48	31	33
LCH	Long-nosed chimaera	111	128	138	157	138	32
SRH	Silver roughy	63	25	33	49	39	26
BBE	Banded bellowsfish	39	31	19	81	41	20
NSD	Northern spiny dogfish	50	27	29	27	45	17
BEL	Bellowsfish	53	56	106	71	54	16
DWD	Deepwater dogfish	68	70	71	79	46	14
CYP	Longnose velvet dogfish	10	20	26	34	31	10
OPE	Orange perch	10	24	15	13	42	9
DWE	Deepwater eel (unspecified)	16	22	40	55	31	9
LAN	Lanternfish	3	6	6	14	24	6

[71] 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.

Species code	Common name	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
BEN	Scabbardfish	44	50	90	133	122	5
RUD	Rudderfish	57	47	46	39	39	5
THR	Thresher shark	31	23	32	34	31	4
ETL	Lucifer dogfish	32	34	36	52	56	3
YBO	Yellow boarfish	8	6	8	16	88	2
POP	Porcupine fish	31	26	31	28	28	2
TOA	Toadfish	28	15	27	32	27	2
SUN	Sunfish	20	13	12	27	23	1

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 2017/18 and 2019/20 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 2017/18 and 2019/20 fishing years (excludes catches from outside the EEZ).

Common name	Observed			Industry-reported		
	17/18	18/19	19/20	17/18	18/19	19/20
Anemones	18,463	7,773	5,064	5,754	4,275	9,249
Corals	240	631	2,656	82	163	35
Corals (generic codes)	2,166	8,141	1,024	3,902	27,922	1,769
Hydroids	23	18	65	-	-	-
Sea pens	169	104	125	-	-	-
Sponges	47,692	18,752	30,639	89,535	78,622	37,493

4.7.2 TRAWL FOOTPRINT

The most recent (2021) iteration of the deepwater trawl footprint[72] estimated the extent of bottom contact by trawl vessels targeting Tier 1 and Tier 2 species between 1990 and 2019.[73] The reporting is based on all relevant reporting data and is reviewed each year through the Aquatic Environment Working Group. The TCER[74], TCEPR[75], and ERS[76] data provide tow-by-tow information that can be used to generate annual trawl footprints that represent the area of the seafloor contacted by trawl gear.

[72] The 2019/20 deepwater trawl footprint report was not published before this ARR, therefore details in this report (though unlikely) may be subject to change

[73] The Latest trawl footprint (between 2018/19 and 2019/20 fishing years) utilises ERS data as it allows for more precision in locating start and end positions

[74] Trawl Catch Effort Processing Return
[75] Trawl Catch Effort Return
[76] Electronic Reporting System

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 trawl footprint between 1990 and 2019 was 351,684km^2. This represents almost 9% of the seafloor between the coastline and the outer boundary of the EEZ and 25% of the seafloor that is open to bottom trawling.
- In 2019 the trawl footprint for both tier 1 and tier 2 species was 43,841km^2, the lowest annual footprint for the past 30 years.
- During 2019, hoki trawls contacted 45% of the cells[77] making up the deepwater trawl footprint while orange roughy contacted 18%. Trawling for scampi, squid, and jack mackerels accounted for 11%, 10%, and 7% of the 2019 footprint area, respectively.

The spatial distribution analysis of where the footprint contacted the seafloor in one year but not in the next suggests that over recent years there has been very little expansion beyond the regularly fished areas, other than in the Challenger area off the west coast of the South Island.[78]

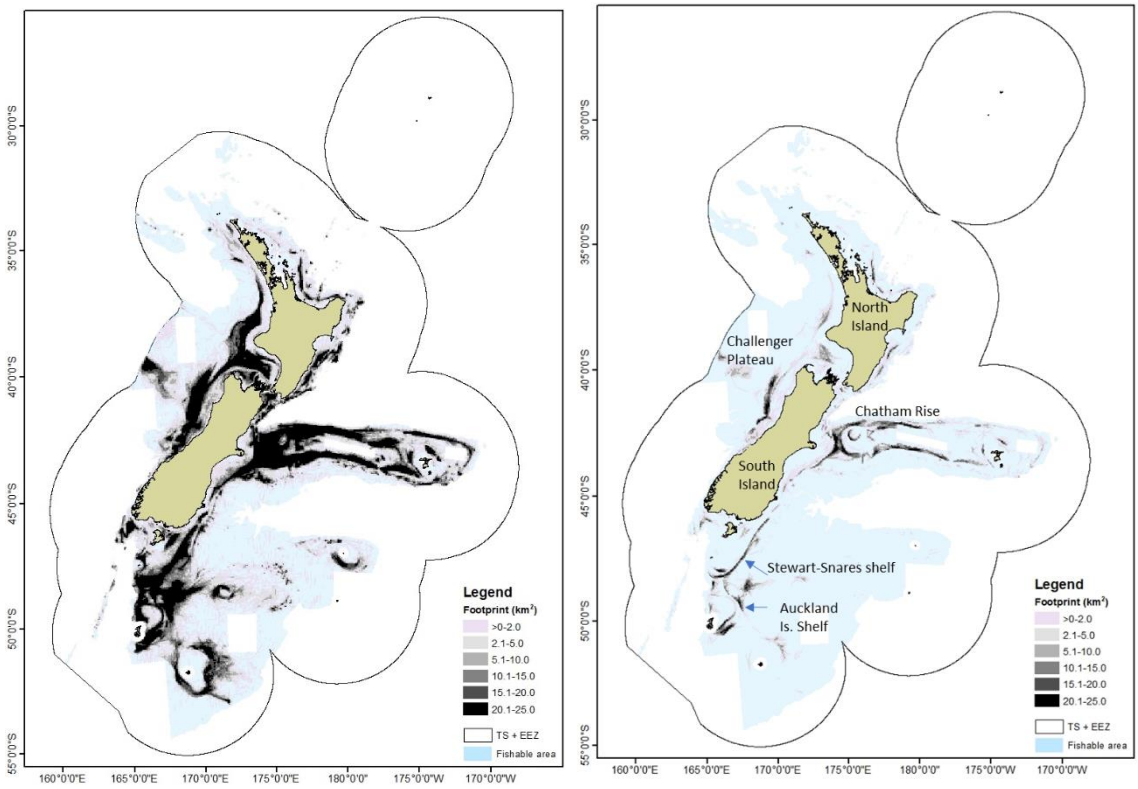

Figure 4: Distribution of the deepwater fishstocks trawl footprint cumulative between 1990 and 2019 (left) and the 2019 year alone (right)

[77] 25km^2 cells are used as reference points. A cell is considered 'contacted' if any part of the cell is trawled
[78] This is not displayed in figure 4

Appendix I: Summaries of Deepwater Fisheries for 2019/20

ALFONSINO (TIER 2) BYX

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
BYX 1	3	304	300	2	2	0
BYX 2	1673	1,575	1,575	-	-	-
BYX 3	713	1,010	1,010	-	-	-
BYX 7	3	81	81	-	-	-
BYX 8	<1	20	20	-	-	-

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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$1
BYX 3								$0
BYX 7								$0
BYX 8								$0
BYX 2		**100-110%**	**110-130%**	**130-150%**	**150-170%**	**170-190%**	**190%+**	**2019/20 Actual**
		$2.20	$2.64	$3.08	$3.52	$3.96	$4.40	$304,044

Environmental indicators		
Benthic interactions[79] (fishable area trawled)	2019/20: 321km^2 (<0.1%)	[80]1990 to 2019: 3,847km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 86.9 m
Export earnings 2020[81]	$NZ 12.5m FOB [82](includes catch taken outside the EEZ)

[79] Trawl footprint statistics include all tows when the species is targeted only.
[80] 1990-2019 trawl footprint is cumulative without accounting for overlap between years.
[81] All export earnings are provisional only and are subject to change.
[82] 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. Note that since export data presented in these tables is for the calendar year, it does not completely align with fishing effort and landings data, which are reported for the fishing year.

BARRACOUTA (TIER 2) BAR

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
BAR 4	1,532	-	3,019	-	-	-
BAR 5	8,826	8,370	8,200	3	2	165
BAR 7	6,831	-	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
BAR 7	$0.12	$0.24	$0.29	$0.34	$0.38	$0.43	$0.48	$0

Stock	**100-110%**	**110-120%**	**120%+**	**2019/20 Actual**
BAR 4	$0.25	$0.50	$1.00	$0
BAR 5				$0

Environmental indicators and observer coverage[83]			
Observer coverage	2017/18: 88% tows observed	2018/19: 82% tows observed	2019/20: 89% tows observed
Seabirds	2017/18: 19 observed captures; 26 estimated	2018/19: 24 observed captures	2019/20: 28 observed capture
Fur seals	2017/18: 2 observed captures	2018/19: 1 observed capture	2019/20: 1 observed capture
Benthic interactions (fishable area trawled)	2019/20: 2,082km^2 (0.15%)	1990 to 2019: 35,422km^2	

Economic indicators (calendar years)	
Quota value 2019	$NZ 83.3 m (includes BAR 1 holdings)
Export earnings 2020	$NZ 30 m FOB[84]

[83] Trawl vessels greater than 28 m in length targeting all barracouta stocks.
[84] All BAR stocks

BLACK CARDINALFISH (TIER 2) CDL

2019/20 Landings, catch limits and allowances (in tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
CDL 1	2	1,320	1,200	0	0	120
CDL 2	341	460	440	0	0	20
CDL 3	103	196	196	0	0	0
CDL 4	8	66	66	0	0	0
CDL 5	2	22	22	0	0	0
CDL 6	1	1	1	0	0	0
CDL 7	7	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

2019/20 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2019/20 Actual**
		100%+		
CDL 1 CDL 6 CDL 7 CDL 8 CDL 9	$0.15	$0.30		$0.30 $115 $0 $0 $0
CDL 5	$0.27	$0.30		$0
Stock	**Interim rate**	**100-120%**	**120%+**	**2019/20 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	2017/18: 0% tows observed	2018/19: 10% tows observed	2019/20: 0% tows observed
Seabirds	2017/18: 0 observed captures; 0 estimated	2018/19: 0 observed captures	2019/20: 0 observed captures
NZ fur seal	2017/18: 0 observed captures	2018/19: 0 observed captures	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)	2019/20: 70km^2 (<0.1%)		1990 to 2019: 2,213km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 5.9 m
Export earnings 2020	$NZ 1.04 m FOB

DARK GHOST SHARK (TIER 2) GSH

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
GSH 4	147	370	370	0	0	0
GSH 5	55	109	109	0	0	0
GSH 6	35	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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 $60 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 0 km^2 (<0.1%)	1990 to 2019: 89 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 7.9 m (includes GSH 1, GSH 2, GSH 3, GSH 7, GSH 8 & GSH 9 holdings)
Export earnings 2020	$NZ 0.4 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

2019/20 Landings, catch limits and allowances [85] (tonnes) (only shown for stocks where catches > 0.1 t were taken)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
KIC 3	0.1	10	10	0	0	0
KIC 5	0.1	10	10	0	0	0
KIC 6	0.5	10	10	0	0	0
GSC 3	11	15	14	0	0	1
GSC 5	86	20	19	0	0	1
GSC 6A	167	165	148	0	0	17
GSC 6B	0.4	250	237	0	0	13
CHC 1	3	10	10	0	0	1

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

2019/20 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)**						**2019/20 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	$0 $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 $12,235 $1,901 $0
CHC 1	$1.62	$1.80	$2.16	$2.52	$2.88	$3.24	$3.60	$0

Economic indicators (calendar year)	
Quota value 2019	$NZ 0.4 m (GSC only)
Export earnings 2020	No export information specific to deepwater crabs is currently available

[85] All catch information is based on the April fishing year (1 April 2019 – 31 March 2020).

BLUE (ENGLISH) MACKEREL (TIER 2) EMA

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
EMA 3	12	392	390	1	1	0
EMA 7	2,409	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
EMA 3	$0.13	$0.26	$0.31	$0.36	$0.42	$0.47	$0.52	$0.36
EMA 7								$0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 24 km^2 (<0.1%)	1990 to 2019: 570 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 26.3 m (includes EMA 1 & EMA 2 holdings)
Export earnings 2020	$NZ 12.7 m FOB (includes all stocks)

FROSTFISH (TIER 2) FRO

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
FRO 3	7	176	176	0	0	-
FRO 4	16	28	28	0	0	-
FRO 5	5	135	135	0	0	-
FRO 6	<1	11	11	0	0	-
FRO 7	931	2,625	2,623	1	1	-
FRO 8	434	649	649	0	0	-
FRO 9	247	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

2019/20 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual rate for catch in excess of ACE[86]**	**2019/20 Actual**
FRO 3	$0.17	$0.34	$0
FRO 4	$0.22	$0.24	$0
FRO 5	$0.08	$0.15	$0
FRO 6			$0
FRO 7			$0
FRO 8	$0.14		$0
FRO 9			$16,621

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 68 km^2 (<0.1%)	1990 to 2019: 1,032 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 6.4 m (includes FRO 1 & FRO 2 holdings)
Export earnings 2020	No export information specific to frostfish is currently available

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

GEMFISH (TIER 2) SKI

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SKI 3	514	606	599	0	1	6
SKI 7	937	606	599	0	1	6

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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$25 $388,419

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 15 km^2 (<0.1%)	1990 to 2019: 2,579 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 19.1 m (includes SKI 1 & SKI 2 holdings)
Export earnings 2020	$NZ 2 m FOB (includes all stocks)

HAKE (TIER 1) HAK

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
HAK 1	1,062	3,701	3,701	-	-	-
HAK 4	137	1,818	1,800	0	0	18
HAK 7	2,063	2,300	2,272	0	5	23

Reference points and current status (as per Harvest Strategy Standard defaults)			
Target	40% B_0	HAK Sub-Antarctic[87]	B_{2018} estimated to be 49% B_0. 'Very Likely' (>90%) to be at or above the target
		HAK Chatham Rise[88]	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)

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$88 $0 $0

Environmental indicators and observer coverage[89]				
Observer coverage		2017/18: 99% tows observed	2018/19: 91% tows observed	2019/20: 79% tows observed
Seabirds		2017/18: 1 observed capture; 1 estimated	2018/19: 0 observed captures	2019/20: 2 observed captures
Marine mammals	NZ fur seal	2017/18: 0 observed captures	2018/19: 1 observed capture	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)		2019/20: 374km^2 (<0.1%)	1990-2019: 21,049 km^2	

Economic indicators (calendar year)	
Quota value 2019	$NZ 75.3 m
Export earnings 2020	$NZ 12.8 m FOB

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

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

[89] Trawl vessels >28 m in length.

HOKI (TIER 1) HOK

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
HOK1	107,709	116,190	115,000	20	20	1,150

Reference points and current status			
Target range	35-50% B_0	Eastern stock[90]	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[91]	B_{2019} estimated to be either 56% B_0 (two stock) or 29% B_0 (west focus).[92] '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

2019/20 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2019/20 Actual**
		100-102%	**102%+**	
HOK 1	\$0.45	\$0.90	\$1.30	\$0

Environmental indicators and observer coverage				
Observer coverage		2017/18: 35% tows observed	2018/19: 29% tows observed	2019/20: 47% tows observed
Seabirds		2017/18: 143 observed captures; 334 estimated	2018/19: 70 observed captures	2019/20: 123 observed captures
Marine mammals	NZ fur seal	2017/18: 41 observed captures	2018/19: 22 observed captures	2019/20: 18 observed captures
	NZ sea lion	2017/18: 1 observed capture	2018/19: 1 observed capture	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)		2019/20: 24,392km^2 (1.75%)	1990 to 2019: 167,649km^2	

Economic indicators (calendar year)	
Quota value 2019	\$NZ 1,251 m
Export earnings 2020	\$NZ 165.3 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 separate catch limits apply to each stock since 2001/02. For the 2019/20 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 2019/20 fishing year.

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

[91] 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.

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

Table 37: Catch limits and actual catch estimates for 2019/20 fishing year (tonnes).

Stock	Catch limit	Catch within agreement (from FishServe)	Estimated catch (all fishers)
Eastern stock	60,000	55,070	52,778
Western stock	55,000	53,030	49,818

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 stongly advised not 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 2012/13 and 2019/20 fishing years.

To allow for a period of undisturbed spawning, all trawlers, regardless of size are strongly advised not 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.

Table 38: Summary of HMA fishing activity by trawl vessels >28 m in length between the 2012/13 and 2019/20 fishing years.

Fishing year	Number of vessels that fished in HMA	Number of HOK target tows[93]	Number of non-HOK target tows	Reported estimated catch of HOK (t)	Estimated catch of all species (t)
Canterbury Banks					
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
2019/20	16	2	262	257	3,441
Mernoo Bank					
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
2019/20	20	0	495	217	3,582
Puysegur Bank					
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
2019/20	11	0	92	99	908
Cook Strait[94]					
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
2019/20	0	0	0	0	0

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

[94] 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

2019/20 Landings, Catch limits and Allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
JMA 3	5,354	9,000	8,780	20	20	180
JMA 7	31,451	32,537	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	**Interim rate**	**100-105%**	**105-120%**	**120%+**				
	$0.18	$0.20	$0.25	$0.30				$7

Environmental indicators and observer coverage				
Observer coverage		2017/18: 86% tows observed	2018/19: 79% tows observed	2019/20: 78% tows observed
Seabirds		2017/18: 10 observed captures; 11 estimated	2018/19: 3 observed captures	2019/20: 1 observed capture
Marine mammals	NZ fur seal	2017/18: 3 observed captures	2018/19: 0 observed captures	2019/20: 0 observed captures
	Common dolphin	2017/18: 1 observed capture	2018/19: 0 observed captures	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)		2019/20: 2,825 km^2 (0.2%)	1990 to 2019: 46,698 km^2	

Economic indicators (calendar year)	
Quota value 2019	$NZ 153 m (includes JMA 1 holdings)
Export earnings 2020	$NZ 66.6 m FOB (for all stocks)

LING (TIER 1) LIN

2019/20 Landings, Catch limits and Allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
LIN 3	1,684	2,060	2,060	0	0	0
LIN 4	1,778	4,200	4,200	0	0	0
LIN 5	4,662	4,834	4,735	1	1	97
LIN 6	3,967	8,590	8,505	0	0	85
LIN 7	3,215	3,458	3,387	1	2	68

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[95]	B_{2018} estimated to be 75%-101% B_0. 'Virtually Certain' (>99%) to be above the target
		LIN 6B[96]	B_{2006} estimated to be 61% B_0. 'Very Likely' (>90%) to be at or above the target.
		LIN 7[97]	B_{2017} estimated to be 54%-79% B_0. 'Very Likely' (>90%) to be at or above the target.
		LIN CS[98]	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

2019/20 Deemed value rates (per kg) and charges					
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**			**2019/20 Actual**
		100-102%	**102-120%**	**Annual 120%+**	
LIN 3 LIN 4 LIN 5 LIN 6	$1.20	$2.38	$3.40	$6.00	$0 $0 $7 $0
LIN 4[99]	$0.56	$1.12			$0
LIN 7	$2.14	$2.38			$0

Environmental indicators and observer coverage (LIN 3 – LIN 7 only)				
Observer coverage	Trawl (>28 m)	2017/18: 51% tows observed	2018/19: 38% tows observed	2019/20: 26% tows observed
	Longline	2017/18: 27% hooks observed	2018/19: 11% hooks observed	2019/20: 17% hooks observed
Seabirds	Trawl (>28 m)	2017/18: 14 observed captures; 33 estimated	2018/19: 5 observed captures	2019/20: 15 observed captures
	Longline	2017/18: 23 observed captures; 335 estimated	2018/19: 18 observed captures	2019/20: 57 observed captures
NZ fur seals	Trawl (>28 m)	2017/18: 1 observed capture	2018/19: 1 observed capture	2019/20: 2 observed captures

[95] Excluding the Bounty Plateau.

[96] Bounty Plateau.

[97] Excluding Cook Strait.

[98] Cook Strait.

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

	Longline	2017/18: 0 observed captures	2018/19: 0 observed captures	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)	2019/20: 1,645 km^2 (0.12%)		1990 to 2019: 27,852 km^2	
Economic indicators (calendar year)				
Quota value 2019	$NZ 554.3 m (includes LIN 1 & LIN 2 holdings)			
Export earnings 2020	$NZ 51.2 m FOB[100]			

LOOKDOWN DORY (TIER 2) LDO

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
LDO 1	121	168	168	0	0	0
LDO 3	277	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

2019/20 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual rate for catch in excess of ACE**	**2019/20 Actual**
LDO 1	$0.38	$0.42	$0
LDO 3	$0.21		$0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 90 km^2 (<0.1%)	1990 to 2019: 1,113 km^2
Economic indicators (calendar year)		
Quota value 2019	$NZ 2.6 m	
Export earnings 2020	This species is not individually listed in export statistics	

[100] Includes all stocks

OREO (TIER 1) OEO

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
OEO1	604	2,500	2,500	0	0	0
OEO3A	2,730	3,518	3,350	0	0	168
OEO4	2,951	3,780	3,600	0	0	180
OEO6	1,446	-	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

2019/20 Deemed value rates (per kg) and charges								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$0
OEO 4	$0.82	$0.90	$1.08	$1.26	$1.44	$1.62	$1.80	$0

Environmental indicators and observer coverage				
Observer coverage		2017/18: 41% tows observed	2018/19: 54% tows observed	2019/20: 37% tows observed
Seabirds		2017/18: 2 observed captures; 4 estimated	2018/19: 1 observed capture	2019/20: 0 observed captures
Marine mammals	NZ fur seal	2017/18: 0 observed captures	2018/19: 1 observed capture	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)		2019/20: 301km^2 (<0.1%)	1990 to 2019: 17,481km^2	

Economic indicators (calendar year)	
Quota value 2019	$NZ 106.7 m (includes all species)
Export earnings 2020	Black oreo - $NZ 3.7 m FOB Smooth oreo - $NZ 2.7 m FOB Oreo, other - $NZ 7.0 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 2019/20 (t)	Industry reported catch (t)	Sum of catch reported via ERS (t)
Southland (*smooth oreo only*)	400	336	30
OEO 1 (*all species*)	2,500	604	604

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	1,236	1,195
Smooth oreo	1,650	1,494	1,425
Totals	3,350	2,730	2,621

OEO 4

Species	Catch limit (t)	Industry reported catch (t)	Sum of estimated catch reported via ERS (t)
Smooth oreo	2,600	2,414	2,364
Black oreo *(includes spiky and warty oreo)*	N/A	536	529
OEO 4 *(all species)*	3,600	2,951	2,893

ORANGE ROUGHY (TIER 1) ORH

2019/20 Landings, catch limits, and allowances (tonnes)							
Stock			**2019/20 Catch**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
ORH 1			679	1,470	1,400	-	-	70
ORH 2A			376	512	488	-	-	24
ORH 2B			61	63	60	-	-	3
ORH 3A			138	186	177	-	-	9
ORH 3B			5,624	7,116	6,772	-	5	339
ORH 7A			1,897	2,163	2,058	-	2	103
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[101]	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[102]	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								

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

[102] Includes the Westpac Bank.

Harvest Control Rule for: ORH 3B NW Chatham Rise, ORH 3B E&S Chatham Rise & ORH 7A	Based on an F_{mid} of 4.5%.[103] 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, *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							
2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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%+**	**2019/20 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%+**			**2019/20 Actual**
ORH 3B	$2.50	$5.00			$6.25			$0
ORH 7A								$0
ORH 7B	$1.60	$3.20			$5.00			$0
Environmental indicators and observer coverage								
Observer coverage		2017/18: 20% tows observed			2018/19: 25% tows observed			2019/20: 33% tows observed
Seabirds		2017/18: 2 observed captures; 11 estimated			2018/19: 3 observed captures			2019/20: 1 observed capture
Marine mammals	NZ fur seal	2017/18: 0 observed captures			2018/19: 0 observed captures			2019/20: 0 observed captures
Benthic impacts (fishable area trawled)		2019/20: 3,008km^2 (0.2%)			1990 to 2019: 41,175km^2			
Economic indicators (calendar year)								
Quota value 2019		$NZ 547.5 m						
Export earnings 2020		$NZ 32.6 m FOB (includes catch from outside the EEZ)						

Table 39: 2019/20 sub-area catch limits and estimated catch for orange roughy stocks (tonnes).

Stock	Sub-area	Agreed catch limit	Industry reported catch	2019/20 Catch (reported via ERS)
ORH 1	Area A	530	136	137
	Area B	530	494	467
	Area C	470	0	0
	Area D	470 (incl. 30 t bycatch limit in the MC Box)	33	45
ORH 2A	ORH 2A North	200	171	142
	ORH 2A South	288	205	194
ORH 3B	NW Chatham Rise	1,150	229	74
	E&S Chatham Rise	4,775	4,776	4,251
	Puysegur	347	359	284
	Sub-Antarctic	500	260	247

[103] *F* refers to a fishing exploitation rate calculated using the harvest control rule

PALE GHOST SHARK (TIER 2) GSP

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
GSP 1	468	1,208	1,150	0	0	58
GSP 5	193	477	454	0	0	23
GSP 7	195	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

2019/20 Deemed value rates (per kg) and invoices			
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**	**2019/20 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 2019	$NZ 2.3 m
Export earnings 2020	$NZ 0.4 m FOB (includes both pale and dark ghost shark, Export statistics are not provided for individual ghost shark species)

PATAGONIAN TOOTHFISH (TIER 2) PTO

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 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

2019/20 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2019/20 Actual**
		100-110%	**110%+**	
PTO 1	$13.50	$15.00	$25.00	$0

Economic indicators (calendar year)	
Quota value 2019	Not available
Export earnings 2020	$NZ 2.3 m FOB[104]

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

PRAWN KILLER (TIER 2) PRK

2019/20 Landings, Catch limits and Allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
PRK 1	<1	25.7	24.5	0	0	1.2
PRK 2	0	3.7	3.5	0	0	0.2
PRK 3	<1	1	1	0	0	0
PRK 4A	0	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[105]**	**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			$0

Economic indicators (calendar year)	
Quota value 2019	Not available
Export earnings 2020	Prawn killer does not feature as an individual species in export statistics; any exports are likely to be reported under the category other crustacea.

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

REDBAIT (TIER 2) RBT

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2018/19 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RBT 1	2	20	19	0	0	1
RBT 3	2,459	2,305	2,190	0	0	115
RBT 7	22	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 Actual**
		100-120%	**120-140%**	**140-160%**	**160-180%**	**180-200%**	**200%+**	
RBT 1	$0.25	$0.50	$0.60	$0.70	$0.80	$0.90	$1.00	$0
RBT 7								$0
RBT 3	$0.45							$160,834

Environmental indicators		
Benthic impacts (fishable area trawled)	2019/20: 9 km^2 (<0.1%)	1990 to 2019: 441 km^2

Economic indicators (calendar year)	
Quota value 2019	NZ$ 11.2 m
Export earnings 2020	Redbait does not feature as an individual species in export statistics; any exports are likely to be reported under the category finfish-product state-other

RIBALDO (TIER 2) RIB

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RIB 3	180	394	394	0	0	0
RIB 4	264	357	357	0	0	0
RIB 5	38	52	52	0	0	0
RIB 6	110	231	231	0	0	0
RIB 7	182	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

2019/20 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%+**	**2019/20 Actual**
RIB 3	$0.15	$0.30	$0.36	$0.42	$0.48	$0.54	$0.60	$0
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%+**		**2019/20 Actual**
RIB 7	$0.72	$0.80		$1.20		$2.50		$0

Environmental indicators		
Benthic impacts (fishable area trawled)	2019/20: 0 km^2 (0%)	1990 to 2019: 104 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 3.3 m (includes RIB 1, RIB 2 & RIB 9 holdings)
Export earnings 2020	No export information specific to ribaldo is currently available; any exports are likely to be reported under the category finfish-product state-other

RUBYFISH (TIER 2) RBY

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
RBY1	302	318	300	1	2	15
RBY2	207	435	433	1	1	0
RBY3	<1	32	30	0	0	2
RBY4	59	19	18	0	0	1
RBY5	<1	0	0	0	0	0
RBY6	0	0	0	0	0	0
RBY7	1	33	33	0	0	0
RBY8	<1	6	6	0	0	0
RBY9	3	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$1
RBY 2								$0
RBY 3								$2
RBY 4								$19,373
RBY 5								$19
RBY 6								$0
RBY 8								$0
RBY 9								$0
Stock	**Interim rate**	**100%+**						**2019/20 Actual**
RBY 7	$0.38	$0.42						$0

Environmental indicators		
Benthic impacts (fishable area trawled)	2019/20: 72 km^2 (<0.1%)	1990 to 2019: 1,564 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 1.9 m
Export earnings 2020	Rubyfish does not feature as an individual species in export statistics; any exports are likely to be reported under the category finfish-product state-other

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	123	126	120	0	0	6
SCI 2	152	161	153	0	0	8
SCI 3	369	428	408	0	0	20
SCI 4A	123	126	120	0	0	6
SCI 5	<1	42	40	0	0	2
SCI 6A	207	321	306	0	0	15
SCI 6B	<1	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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		2017/18: 13% tows observed	2018/19: 16% tows observed	2019/20: 12% tows observed
Seabirds		2017/18: 19 observed captures; 130 estimated	2018/19: 17 observed captures	2019/20: 9 observed captures
Marine mammals	NZ fur seal	2017/18: 0 observed captures	2018/19: 0 observed captures	2019/20: 1 observed capture
	NZ sea lion	2017/18: 2 observed captures	2018/19: 1 observed capture	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)		2019/20: 4,598km^2 (0.3%)	1990 to 2019: 20,938km^2	

Economic Indicators (calendar year)	
Quota value 2019	$NZ 547.2 m
Export earnings 2020	$NZ 40.6 m[106]

[106] Scampi is not specified in the collated export statistics through Seafood New Zealand. The figure given is the best estimate, calculated through various crustacea exports

SEA PERCH (TIER 2) SPE

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SPE 3	497	1,022	1,000	11	11	0
SPE 4	442	956	910	0	0	46
SPE 5	15	38	36	1	1	0
SPE 6	1	9	9	0	0	0
SPE 7	57	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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$0 $0
SPE 4 SPE 5 SPE 6	$0.36	$0.40	$0.48	$0.56	$0.64	$0.72	$0.80	$0 $27 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 247 km^2 (<0.1%)	1990 to 2019: 4,877 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 7.6 m (includes SPE 1 & SPE 2 holdings)
Export earnings 2020	$NZ 1.2 m FOB (includes all stocks)

SILVER WAREHOU (TIER 2) SWA

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SWA 1	460	3,003	3,000	2	1	0
SWA 3	3,352	-	3,280	-	-	-
SWA 4	3,954	-	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

2019/20 Deemed value rates (per kg) and invoices					
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**			**2019/20 Actual**
		100-110%	**110-130%**	**130%+**	
SWA 1	\$0.50	\$1.22	\$1.74	\$3.00	\$0
SWA 3 SWA 4	\$0.63	\$0.70	\$0.70	\$2.00	\$68,249 \$19,159

Environmental indicators and observer coverage			
Observer coverage	2017/18: 60% tows observed	2081/19: 66% tows observed	2019/20: 59% observed
Seabirds	2017/18: 11 observed captures	2018/19: 16 observed captures	2019/20: 6 observed capture
NZ fur seal	2017/18: 0 observed captures	2018/19: 0 observed captures	2019/20: 1 observed capture
Benthic interactions (fishable area trawled)	2019/20: 958 km^2 (<0.1%)	1990 to 2019: 26,149 km^2	

Economic indicators (calendar year)	
Quota value 2019	\$NZ 195.7 m
Export earnings 2020	\$NZ 19.6 m FOB

SOUTHERN BLUE WHITING (TIER 1) SBW

Landings, catch limits and allowances as of 1 April 2020 (tonnes)						
Stock	**2019/20 Landings[107]**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SBW 1	39 (39)	100	98	0	0	2
SBW 6A	182 (38)	1,640	1,640	0	0	0
SBW 6B	788 (1,100)	3,209	3,145	0	0	64
SBW 6I	26,517 (11,982)	40,000	39,200	0	0	800
SBW 6R	3,631 (<1)	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[108]
		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

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$0
Stock		**100-102%**		**102-150%**		**150%+**		**2019/20 Actual**
SBW 6A SBW 6B SBW 6I SBW 6R		$0.46		$0.60		$0.92		$244 $0 $0 $0

Environmental indicators and observer coverage				
Observer coverage		2017/18: 100% tows observed	2018/19: 100% tows observed	2019/20: 100% tows observed
Seabirds		2017/18: 6 observed captures	2018/19: 3 observed captures,	2019/20: 12 observed captures
Marine mammals	NZ fur seals	2017/18: 17 observed captures	2018/19: 11 observed captures	2019/20: 8 observed captures
	NZ sea lion	2017/18: 2 observed captures	2018/19: 0 observed captures	2019/20: 1 observed captures
Benthic interactions (fishable area trawled)		2019/20: 757km^2 (<0.1%)	1990 to 2019: 23,348km^2	

Economic indicators (calendar year)	
Quota value 2019	$NZ 205.1 m
Export earnings 2020	$NZ 17.1 m FOB

SPINY DOGFISH (TIER 2) SPD

2019/20 Landings, catch limits and allowances (tonnes)

[107] 2019/20 landings from the 1 April 2019 – 30 March 2020 fishing year. Figures in brackets indicate landings for the 2020 'season' (the 2020/21 fishing year).
[108] F refers to a fishing mortality rate calculated using the harvest control rule.

Stock	2019/20 Landings	TAC	TACC	Recreational	Customary	Other fishing related mortality
SPD 4	907	1,662	1,626	10	10	20
SPD 5	1060	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

2019/20 Deemed value rates (per kg) and invoices			
Stock	**Interim**	**Annual rate for catch in excess of ACE[109]**	**2019/20 Actual**
SPD 4 SPD 5	$0.05	$0.10	$0 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 0 km^2 (0%)	1990 to 2019: 1,428 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 12.7 m (includes SPD 1, SPD 3, SPD 7 & SPD 8 holdings)
Export earnings 2020	$NZ 0.07 m FOB (includes all SPD stocks)

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

SQUID (TIER 1) SQU

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
SQU 1J	<1	5,030	5,000	10	10	10
SQU 1T	25,639	44,741	44,741	0	0	0
SQU 6T	16,393	-	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.

2019/20 Deemed value rates (per kg) and invoices								
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**						**2019/20 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	$0 $2 $0

Environmental indicators and observer coverage[110]				
Observer coverage		2017/18: 94% tows observed	2018/19: 88% tows observed	2019/20: 80% tows observed
Seabirds		2017/18: 256 observed captures; 276 estimated	2018/19: 347 observed captures	2019/20: 412 observed captures
Marine mammals	NZ fur seals	2017/18: 14 observed captures	2018/19: 25 observed captures	2019/20: 23 observed captures
	NZ sea lion	2017/18: 3 observed captures	2018/19: 7 observed captures	2019/20: 0 observed captures
Benthic interactions (fishable area trawled)			2019/20: 3,926km^2 (0.3%)	1990 to 2019: 41,848km^2

Economic indicators (calendar years)	
Quota value 2019	$NZ 149.4 m
Export earnings 2020	$NZ 192.9 m FOB

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

WHITE WAREHOU (TIER 2) WWA

2019/20 Landings, catch limits and allowances (tonnes)						
Stock	**2019/20 Landings**	**TAC**	**TACC**	**Recreational**	**Customary**	**Other fishing related mortality**
WWA 1	<1	4	4	0	0	0
WWA 2	3	75	73	1	1	0
WWA 3	185	585	583	1	1	0
WWA 4	72	332	330	1	1	0
WWA 5B	336	2,621	2,617	2	2	0
WWA 7	47	129	127	1	1	0
WWA 8	0	1	1	0	0	0
WWA 9	0	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

2019/20 Deemed value rates (per kg) and invoices				
Stock	**Interim rate**	**Annual differential rate for excess catch (% of ACE)**		**2019/20 Actual**
		100%+		
WWA 1 WWA 2 WWA 8 WWA 9	$0.27	$0.54		$36 $0 $0 $0
Stock	**Interim rate**	**100-110%**	**110%+**	**2019/20 Actual**
WWA 3 WWA 4 WWA 5B WWA 7	$0.52	$1.03	$2.00	$0 $0 $26 $0

Environmental indicators		
Benthic interactions (fishable area trawled)	2019/20: 112 km^2 (<0.1%)	1990 to 2019: 3,689 km^2

Economic indicators (calendar year)	
Quota value 2019	$NZ 21.6 m
Export earnings 2020	$NZ 0.81 m FOB[111]

[111] Information in export statistics for "Warehou, Other" is warehou other than blue or silver, therefore it's assumed to be white warehou.

Appendix II: Decisions on sustainability measures for the 2019/20 fishing year

TAC REVIEWS

Species	Stock	Pre-1 Oct 2019 TAC (t)	Pre-1 Oct 2019 TACC (t)	1-Oct-2019 TAC (t)	1 Oct 2019 TACC (t)
Gemfish	SKI 3	300	300	606	599
Gemfish	SKI 7	300	300	606	599
Hake	HAK 7	5,120	5,064	2,300	2,272
Hoki	HOK 1	151,540	150,000	116,190	115,000
Ling	LIN 7	3,144	3,080	3,458	3,387
Orange roughy	ORH 7A	1,680	1,600	2,163	2,058
Orange roughy	ORH 3B	6,413	6,091	7,116	6,772

DEEMED VALUE RATE REVIEW

Species	Stock		Interim deemed value rate $/kg	Standard annual differential rates for excess catch (% of ACE) $/kg					
				100%+					
Cardinal fish	CDL 5	Pre 1 Oct 2019	$0.26	0.52					
	CDL 5	1-Oct-19	$0.27	$0.30					
Jack mackerel	JMA 7	Pre 1 Oct 2019	$0.14	100-120%	120-140%	140-160%	160-180%	180-200%	200%+
				$0.15	$0.18	$0.21	$0.24	$0.27	$0.30
		1-Oct 2019	$0.18	100-105%		105-120%		120%+	
				$0.20		$0.25		$0.30	
Silver warehou	SWA 3	Pre 1 Oct 2019	$1.57	100-110%		110-130%		130%+	
				$1.74		$2.00		$3.00	
	SWA 4	Pre 1 Oct 2019	$0.50	$1.22		$1.74		$3.00	
	SWA 3	1-Oct-19	$0.63	$0.70		$0.70		$2.00	
	SWA 4	1-Oct-19	$0.63	$0.70		$0.70		$2.00	

Appendix III- MSC certified stocks

Important deepwater fisheries are certified by the internationally recognised Marine Stewardship Council (MSC) as meeting high sustainability and environmental standards.

New Zealand certified deepwater fisheries include hoki, hake, ling, southern blue whiting and orange roughy.

Certification gives New Zealanders:

- assurance that these fisheries are being managed sustainably
- access to important international markets for certain species – others can trust our fishing practices.

In the tables below are some (but not all) of the required statistics for the renewal of the MSC certification.

Table 40: Tows observed and percentage of tows observed in the 2018/19 and 2019/20 fishing years within the relevant stocks of HAK, HOK, LIN and SBW target fisheries

Fishery	QMA	2018/19			2019/20		
		observed tows	total tows	% tows observed	Observed tows	total tows	% tows observed
Hake	HAK1	27	29	93%	42	42	100%
	HAK4	1	1	100%	0	0	-
	HAK7	42	131	32%	163	219	74%
Hoki	HOK1	3,486	12,007	29%	3,589	8,216	44%
Ling	LIN3	1	13	8%	3	32	9%
	LIN4	0	45	0%	0	2	0%
	LIN5	150	541	28%	94	542	17%
	LIN6	134	389	34%	191	370	52%
	LIN7	9	197	5%	39	383	10%
Southern blue whiting	SBW6B	152	152	100%	14	14	100%
	SBW6I	596	596	100%	334	334	100%

Table 41: Number of observed hooks and percentage of hooks observed in the 2018/19 and 2019/20 fishing years for line bottom longline fishery (LIN 3- 7).

Fishing year	Hooks set	Observed	
		Hooks observed	% of hooks observed
2018/19	20,836,681	2,375,340	11%
2019/20	19,213,033	3,271,623	17%

Table 42: Industry reported ETP[112] coral catch in the 2018/19 and 2019/20 fishing years for HOK, HAK, LIN and SBW trawl fishery

ETP corals catch	2018/19				2019/20			
	HOK	HAK	LIN	SBW	HOK	HAK	LIN	SBW
Coral catch (kg)	12	4	0	0	2	0	1	0
No. tows with coral	4	4	0	0	2	0	1	0
No. observed tows	3,486	70	294	748	3,589	205	327	348
% tows with coral	0.03%	2.48%	0.00%	0.00%	0.02%	0.00%	0.08%	0.00%
Catch rate (kg/tow)	0.001	0.025	0.000	0.000	0.000	0.000	0.001	0.000

Table 43: Total estimated ling catches (kg) for ling target fisheries in stocks LIN3-7 (including LIN6B) for 2018/19 and 2019/20 fishing year

QMA 2018/19	Trawl	BLL	Other methods	Total
LIN3	1,431	634,440	126,680	762,551
LIN4	39,064	1,105,561	271,176	1,415,801
LIN5	3,002,711	336,231	31,600	3,370,542
LIN6[113]	1,724,024	1,133,684	315	2,858,023
LIN6B	*0*	*199,973*	*0*	*199,973*
LIN7	118,058	1,044,042	0	1,162,100
Total	**4,885,288**	**4,253,957**	**429,771**	**9,569,017**
QMA 2019/20	**Trawl**	**BLL**	**Other methods**	**Total**
LIN3	5,745	554,175	217,782	777,703
LIN4	230	1,047,607	159,436	1,207,273
LIN5	3,110,650	387,296	10,500	3,508,446
LIN6[114]	1,741,905	1,524,295	0	3,266,200
LIN6B	*300*	*208,694*	*0*	*208,994*
LIN7	348,127	1,312,779	25,050	1,685,956
Total	**5,206,658**	**4,826,152**	**412,768**	**10,445,578**

Table 44: Fisher reported incidental capture of non-fish species (excl. benthic) during 2018/19 and 2019/20. (Figures in brackets indicate BLL captures)

Target fishery	2018/19				2019/20			
	Seabirds	Sea lions	Fur seals	Dolphins/ whales	Seabirds	Sea lions	Fur seals	Dolphins/ whales
HAK	0	0	2	0	1	0	0	1
HOK	173	2	60	2	138	1	77	3
LIN *(BLL)*	98 *(75)*	1 (0)	1(0)	0 (0)	246 *(227)*	0 (0)	2 (0)	0 (0)
SBW	7	0	11	0	9	1	8	0
Total	**278**	**3**	**74**	**2**	**394**	**2**	**87**	**4**

[112] Endangered, threatened and protected species
[113] Includes LIN6B catch
[114] Includes LIN6B catch

Table 45: ETP shark capture in the HAK, HOK, LIN and SBW trawl fisheries between 2018/19 and 2019/20 fishing year.

Fishery	2018/19		2019/20	
	BSK	WPS	BSK	WPS
HAK	1	0	0	0
HOK	1	0	2	0
LIN	0	0	1	0
SBW	0	0	0	0

Table 46: Trawl footprint of the HAK, HOK, LIN and SBW trawl fisheries between the 2018/19 and 2019/20 fishing year[115]

Fishery	Trawl footprint (km^2)	
	2018/19	2019/20
HAK	709	374
HOK	29,983	24,392
LIN	1,536	1,645
SBW	744	757

[115] These figures come from a paper which has not yet been published (Extent of bottom contact by commercial trawling and dredging in New Zealand waters, 1989–90 to 2018–19)

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 (Fisheries 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 Fisheries 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 2019/20 financial year

Table 47: Cost recovery levies ($) for deepwater stocks for the 2019/20 fishing year.

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2019/20 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
BAR 4	11,268	3,331	4,700	941	81,242	467	987	159	103,095
BAR 5	30,451	9,003	3,184	622	13,618	1,600	2,352	254	61,084
BAR 7	44,162	13,057	47,411	9,525	14,218	2,081	3,986	1,488	135,928
BYX 1	8,555	2,529	29	0	474	177	-433	0	11,331
BYX 10	275	81	1	0	0	0	-16	0	341
BYX 2	45,308	13,395	11,550	1,445	2,509	939	-2,612	-80	72,454
BYX 3	24,710	7,306	6,981	874	356	0	-3,239	-253	36,735
BYX 7	2,198	650	7	0	122	0	-110	0	2,867
BYX 8	546	161	2	0	30	0	-40	0	699
CDL 1	15,664	4,631	52	0	41	0	-1,221	0	19,169
CDL 10	0	0	0	0	0	0	0	0	0
CDL 2	5,840	1,727	1,523	190	15	26	-341	-12	8,968
CDL 3	2,513	743	8	0	7	0	-192	0	3,079
CDL 4	574	170	2	0	2	0	-67	0	680
CDL 5	208	61	1	0	1	0	-22	0	248
CDL 6	13	4	0	0	0	0	-1	0	16
CDL 7	393	116	1	0	1	0	-40	0	472
CDL 8	0	0	0	0	0	0	0	0	0
CDL 9	56	17	0	0	0	0	-4	0	69
CHC 1	28	8	0	0	0	0	-2	0	35
CHC 10	0	0	0	0	0	0	0	0	0
CHC 2	28	8	0	0	0	0	-2	0	35
CHC 3	11	3	0	0	0	0	-1	0	14
CHC 4	11	3	0	0	0	0	-1	0	14
CHC 5	11	3	0	0	0	0	-1	0	14
CHC 6	11	3	0	0	0	0	-1	0	14
CHC 7	11	3	0	0	0	0	-1	0	14
CHC 8	11	3	0	0	0	0	-1	0	14
CHC 9	11	3	0	0	0	0	-1	0	14
EMA 3	1,902	562	6	0	5	41	-141	-2	2,373
EMA 7	8,649	2,557	8,381	1,686	38,911	187	-1,536	597	59,432
FRO 3	4,071	1,204	14	0	11	0	-279	0	5,020
FRO 4	119	35	0	0	0	0	-10	0	146
FRO 5	516	152	2	0	1	0	-172	0	499
FRO 6	76	22	0	0	0	0	-5	0	94
FRO 7	33,295	9,844	112	0	88	0	-2,323	0	41,015

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2019/20 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
FRO 8	1,513	447	5	0	4	0	-157	0	1,812
FRO 9	610	180	2	0	2	0	-29	0	765
GSC 1	3	1	0	0	0	0	0	0	3
GSC 10	0	0	0	0	0	0	0	0	0
GSC 3	39	12	0	0	0	0	-2	0	49
GSC 5	54	16	0	0	0	0	-3	0	66
GSC 6A	62	18	0	0	0	0	-4	0	77
GSC 6B	669	198	2	0	0	0	-40	0	829
GSH 4	1,692	500	6	0	4	37	-152	-1	2,086
GSH 5	488	144	2	0	8	0	-68	0	573
GSH 6	524	155	2	0	1	0	-54	0	628
GSP 1	6,159	1,821	21	0	16	20	-731	-6	7,300
GSP 5	2,260	668	8	0	6	0	-294	0	2,647
GSP 7	910	269	3	0	2	0	-104	-1	1,080
HAK 1	93,859	27,749	9,035	1,758	4,667	5,975	-11,989	0	131,055
HAK 10	166	49	1	0	0	0	-10	0	206
HAK 4	37,168	10,989	4,480	879	1,848	970	-7,869	363	48,829
HAK 7	93,012	27,499	12,601	2,477	4,625	3,289	-10,853	-627	132,023
HOK 1	1,341,834	396,714	649,875	130,103	66,722	160,950	365,316	23,815	3,135,328
HOK 10	113	33	0	0	0	0	-7	0	140
JMA 3	25,970	7,678	3,727	735	2,922	2,328	-40,297	-3,063	0
JMA 7	82,968	24,530	40,287	8,066	14,182	4,061	-16,719	2,850	160,224
KIC 1	28	8	0	0	0	0	-2	0	35
KIC 10	0	0	0	0	0	0	0	0	0
KIC 2	28	8	0	0	0	0	-2	0	35
KIC 3	28	8	0	0	0	0	-2	0	35
KIC 4	28	8	0	0	0	0	-2	0	35
KIC 5	28	8	0	0	0	0	-2	0	35
KIC 6	28	8	0	0	0	0	-2	0	35
KIC 7	28	8	0	0	0	0	-2	0	35
KIC 8	28	8	0	0	0	0	-2	0	35
KIC 9	28	8	0	0	0	0	-2	0	35
LDO 1	3,460	1,023	12		9	0	-258	0	4,246
LDO 10	21	6	0	0	0	0	-1	0	26
LDO 3	11,104	3,283	37		29	0	-926	0	13,527
LIN 3	79,304	23,446	24,841	4,955	198,169	4,510	-9,846	645	326,024
LIN 4	146,928	43,439	50,884	10,157	4,287	4,287	-11,353	1,291	249,920
LIN 5	157,971	46,704	39,126	7,782	9,144	9,144	-11,692	-648	257,532
LIN 6	297,630	87,994	84,941	16,921	90,575	18,948	6,792	1,399	605,200
LIN 7	105,422	31,168	39,099	7,808	329,277	4,551	-152,456	-1,035	363,834

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2019/20 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
OEO 1	25,152	7,436	3,374	416	14,583	774	-50,544	-1,191	0
OEO 10	101	30	0	0	0	0	-6	0	125
OEO 3A	33,703	9,964	11,813	1,486	74,544	2,070	-51,851	-344	81,385
OEO 4	36,218	10,708	10,597	1,331	77,897	2,812	-135,420	-4,144	0
OEO 6	60,364	17,847	8,095	1,002	18,518	3,109	-4,516	585	105,003
ORH 1	34,877	10,311	12,699	1,599	15,109	2,060	-2,468	-81	74,106
ORH 10	350	103	1	0	0	0	-22	0	433
ORH 2A	20,002	5,914	5,197	653	13,456	1,030	-44,569	-1,683	0
ORH 2B	2,015	596	655	82	11,437	104	-14,703	-186	0
ORH 3A	5,791	1,712	1,972	247	11,850	316	-21,325	-563	0
ORH 3B	208,286	61,580	137,435	17,355	92,322	19,651	-151,799	-49	384,780
ORH 7A	55,649	16,453	40,686	5,141	42,555	250	97,979	1,125	259,837
ORH 7B	18	5	0	0	11,774	0	-11,798	0	0
PRK 1	1,182	349	4	0	3	0	-81	0	1,457
PRK 10	0	0	0	0	0	0	0	0	0
PRK 2	169	50	1	0	0	0	-12	0	208
PRK 3	48	14	0	0	0	0	-3	0	59
PRK 4A	48	14	0	0	0	0	-3	0	59
PRK 5	48	14	0	0	0	0	-3	0	59
PRK 6A	48	14	0	0	0	0	-3	0	59
PRK 6B	48	14	0	0	0	0	-3	0	59
PRK 7	8	2	0	0	0	0	-3	0	7
PRK 8	48	14	0	0	0	0	-3	0	59
PRK 9	48	14	0	0	0	0	-3	0	59
PTO 1	6,981	2,064	23	0	0	0	411	0	9,480
RBT 1	105	31	0	0	0	0	-7	0	129
RBT 10	0	0	0	0	0	0	0	0	0
RBT 3	3,030	896	402	77	8	14	-4,335	-91	0
RBT 7	15,627	4,620	52	0	41	72	-1,070	0	19,342
RBY 1	6,506	1,924	22	0	17	0	-661	0	7,808
RBY 10	0	0	0	0	0	0	0	0	0
RBY 2	1,648	487	397	51	4	7	-92	-3	2,500
RBY 3	109	32	0	0	0	0	-7	0	136
RBY 4	60	18	0	0	0	0	-56	0	22
RBY 5	0	0	0	0	0	0	0	0	0
RBY 6	0	0	0	0	0	0	0	0	0
RBY 7	204	60	1	0	1	0	-14	0	251
RBY 8	96	29	0	0	0	0	-7	0	119
RBY 9	197	58	1	0	1	0	-13	0	243
RIB 3	3,683	1,089	12	0	10	0	-319	0	4,475

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2019/20 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
RIB 4	2,634	779	9	0	119	0	-320	0	3,221
RIB 5	428	126	1	0	1	0	-32	0	525
RIB 6	1,236	366	4	0	3	0	-154	0	1,455
RIB 7	2,635	779	9	0	7	0	-242	0	3,189
RIB 8	10	3	0	0	0	0	-1	0	13
SBW 1	415	123	1	0	1	3	-25	0	518
SBW 6A	9,715	2,872	33	0	33	664	-730	-2	12,584
SBW 6B	24,840	7,344	6,667	1,881	75,929	18,682	-4,141	-606	130,596
SBW 6I	348,307	102,977	123,341	34,894	2,737,784	20,630	69,124	-11,237	3,425,822
SBW 6R	43,440	12,843	15,382	4,354	32	2,573	-71,698	-6,927	0
SCI 1	28,841	8,527	19,339	5,495	2,451	3,197	-5,884	-1,220	60,746
SCI 10	0	0	0	0	0	0	0	0	0
SCI 2	34,741	10,271	23,296	6,621	2,952	3,587	-73	-1,604	79,793
SCI 3	103,209	30,514	57,730	16,388	929,890	11,776	-166,805	-3,568	979,133
SCI 4A	27,387	8,097	18,366	5,218	1,516	4,442	-40,158	-1,079	23,790
SCI 5	7,802	2,307	26	0	432	566	-546	0	10,588
SCI 6A	65,826	19,462	44,140	12,543	156,748	18,622	-8,439	-3,340	305,563
SCI 6B	9,753	2,883	33	0	540	918	-682	-8	13,437
SCI 7	19,568	5,785	66	0	1,084	1,419	-1,314	0	26,608
SCI 8	975	288	3	0	54	71	-68	0	1,323
SCI 9	6,827	2,018	23	0	378	495	-478	0	9,264
SKI 3	5,106	1,510	17	0	14	110	-466	-5	6,286
SKI 7	5,801	1,715	19	0	15	151	-382	-4	7,315
SPD 4	5,963	1,763	20	0		0	-589	128.79492	7,157
SPD 5	8,871	2,623	30	0		0	1,130	191.62647	12,654
SPE 3	9,977	2,950	33	0	157	216	-719	215.50593	12,613
SPE 4	4,157	1,229	14	0	11	108	-534	89.784738	4,985
SPE 5	255	75	1	0	4	0	-14	0	321
SPE 6	67	20	0	0	0	0	-2	0	85
SPE 7	513	152	2	0	1	11	-55	11.083889	624
SQU 10T	161	48	1	0	0	0	-9	0	199
SQU 1J	80,392	23,768	269	0	0	0	-27,242	0	77,187
SQU 1T	772,702	228,450	263,282	74,451	43,363	69,015	145,608	36285.782	1,596,872
SQU 6T	568,366	168,038	191,209	54,063	39,284	144,276	-76,290	26690.236	1,088,947
SWA 1	32,082	9,485	107	0	13,537	842	-55,211	692.988	842
SWA 10	117	35	0	0	0	0	-7	0	145
SWA 3	32,766	9,687	3,818	745	15,648	3,090	-3,206	1538.688	62,548
SWA 4	47,259	13,972	6,593	1,295	16,640	5,521	7,031	2219.2404	98,311
WWA 1	80	24	0	0	11,772	0	-6	0	11,870
WWA 10	0	0	0	0	0	0	0	0	0

Fish stock	Compliance	Registry	Observers		Research		Under/over recovery		2019/20 total
	MPI	MPI	MPI	DOC	MPI	DOC	MPI	DOC	
WWA 2	1,989	588	7	0	11,464	43	-142	42.969557	13,949
WWA 3	13,350	3,947	1,944	380	11,767	348	-964	288.37575	30,773
WWA 4	8,150	2,410	1,085	211	11,723	176	-584	176.05656	23,171
WWA 5B	74,469	22,017	7,665	1,496	11,951	4,645	-7,605	3497.0276	114,638
WWA 7	2,826	836	9	0	11,597	61	-233	61.054225	15,097
WWA 8	21	6	0	0	11,772	0	-2	0	11,798
WWA 9	0	0	0	0	0	0	0	0	0
Grand Total	**5,670,159**	**1,676,387**	**2,061,003**	**456,400**	**5,382,962**	**573,118**	**-559,797**	**63,035**	**15,251,136**

Table 48: Levies by stock as a percent of landed value for the 2019/20 fishing year[116]

Fish stock	Total levies ($)	Landings (kg)	Port price ($/kg)	Landed value ($)	Levies as % landed value
BAR 4	103,095	1,532,408	0.26	405,509	25%
BAR 5	61,084	8,825,688	0.26	2,323,790	3%
BAR 7	135,928	6,831,246	0.28	1,914,487	7%
BYX 1	11,331	3,489	2.02	7,054	161%
BYX 2	72,454	1,672,772	2.04	3,412,300	2%
BYX 3	36,735	712,832	1.73	1,236,051	3%
BYX 7	2,867	3,334	1.94	6,454	44%
CDL 1	19,169	2,010	0.93	1,860	1030%
CDL 2	8,968	340,834	0.94	320,763	3%
CDL 3	3,079	103,226	0.91	93,827	3%
CDL 4	680	8,210	0.62	5,062	13%
CDL 5	248	1,954	0.67	1,308	19%
CDL 7	472	7,178	0.72	5,135	9%
EMA 3	2,373	12,688	0.35	4,387	54%
EMA 7	59,432	2,409,030	0.18	440,984	13%
FRO 3	5,020	6,721	1.64	11,022	46%
FRO 4	146	15,521	0.30	4,689	3%
FRO 5	499	4,793	0.27	1,298	38%
FRO 7	41,015	931,038	0.90	837,934	5%
FRO 8	1,812	434,156	0.17	71,764	3%
FRO 9	765	246,798	0.31	77,404	1%
GSH 4	2,086	146,707	0.32	47,566	4%
GSH 5	573	54,692	0.32	17,349	3%
GSH 6	628	34,572	0.39	13,518	5%
GSP 1	7,300	468,052	0.38	177,734	4%
GSP 5	2,647	193,274	0.35	68,206	4%
GSP 7	1,080	19,487	0.37	7,145	15%
HAK 1	131,055	1,062,020	1.80	1,909,575	7%
HAK 4	48,829	136,607	1.46	200,003	24%
HAK 7	132,023	2,062,838	1.30	2,686,428	5%
HOK 1	3,135,328	107,708,810	0.63	68,316,068	5%

[116] 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
JMA 7	160,224	31,450,718	0.18	5,686,308	3%
LDO 1	4,246	121,496	1.46	177,436	2%
LDO 3	13,527	277,324	1.28	355,590	4%
LIN 3	326,024	1,684,606	2.73	4,598,247	7%
LIN 4	249,920	1,778,345	2.48	4,410,979	6%
LIN 5	257,532	4,662,472	2.37	11,029,032	2%
LIN 6	605,200	3,966,920	2.48	9,842,821	6%
LIN 7	363,834	3,215,016	2.43	7,802,376	5%
OEO 3A	81,385	2,730,937	0.71	1,948,050	4%
OEO 6	105,003	1,445,981	0.71	1,031,457	10%
ORH 1	74,106	678,573	1.77	1,198,590	6%
ORH 3B	384,780	5,624,134	2.42	13,636,106	3%
ORH 7A	259,837	1,897,413	2.47	4,679,103	6%
RBT 1	129	1,553	0.39	606	21%
RBT 7	19,342	21,740	0.39	8,479	228%
RBY 1	7,808	301,613	1.54	463,789	2%
RBY 2	2,500	206,509	0.27	55,722	4%
RBY 7	251	1,125	0.44	492	51%
RBY 8	119	602	1.14	686	17%
RBY 9	243	3,113	0.73	2,288	11%
RIB 3	4,475	179,648	0.66	119,064	4%
RIB 4	3,221	264,233	0.52	138,231	2%
RIB 5	525	38,370	0.58	22,382	2%
RIB 6	1,455	109,889	0.38	41,699	3%
RIB 7	3,189	182,220	0.57	103,181	3%
SBW 1	518	38,776	0.30	11,633	4%
SBW 6A	12,584	182,078	0.42	76,473	16%
SBW 6B	130,596	787,684	0.56	441,103	30%
SBW 6I	3,425,822	26,517,401	0.63	16,705,963	21%
SCI 1	60,746	123,029	17.04	2,096,553	3%
SCI 2	79,793	152,249	16.10	2,451,178	3%
SCI 3	979,133	368,574	17.94	6,610,694	15%
SCI 4A	23,790	122,561	16.18	1,983,267	1%

Fish stock	Total levies ($)	Landings (kg)	Port price ($/kg)	Landed value ($)	Levies as % landed value
SCI 5	10,588	24	13.83	332	3190%
SCI 6A	305,563	207,178	15.25	3,159,987	10%
SCI 7	26,608	787	18.50	14,559	183%
SKI 3	6,286	513,542	1.98	1,016,899	1%
SKI 7	7,315	937,230	1.37	1,284,900	1%
SPD 4	7,157	907,026	0.26	235,827	3%
SPD 5	12,654	1,060,100	0.17	180,217	7%
SPE 3	12,613	497,198	0.71	351,709	4%
SPE 4	4,985	441,989	0.32	143,142	3%
SPE 5	321	14,928	0.50	7,488	4%
SPE 7	624	57,259	0.44	25,405	2%
SQU 1T	1,596,872	25,638,639	1.22	31,395,444	5%
SQU 6T	1,088,947	16,392,800	1.24	20,408,478	5%
SWA 1	842	459,822	0.76	348,650	0%
SWA 3	62,548	3,352,080	0.71	2,374,057	3%
SWA 4	98,311	3,953,874	0.82	3,239,322	3%
WWA 1	11,870	84	1.41	118	10026%
WWA 2	13,949	2,905	1.93	5,613	249%
WWA 3	30,773	184,590	1.62	299,705	10%
WWA 4	23,171	72,276	1.75	126,569	18%
WWA 5B	114,638	336,303	2.02	678,525	17%
WWA 7	15,097	46,584	1.58	73,510	21%

Appendix VI: Observer interim trip report template

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