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# New Zealand Orange Roughy Fishery
## Certificate No: MSC-F-31281

# 4th Surveillance Report

| | |
|---|---|
| Conformity Assessment Body (CAB) | MRAG Americas, Inc. |
| Assessment team | Andre Punt, Amanda Stern-Pirlot, Robert J Trumble |
| Fishery client | Deepwater Group Limited (DWG) |
| Assessment type | Fourth Surveillance |
| Author name | Andre Punt, Amanda Stern-Pirlot, Robert J Trumble |
| Date | 18 January 2022 |

# 1 Contents



# 2 Executive summary

This report contains the findings of the 4th surveillance cycle in relation to the New Zealand Orange Roughy Fishery and an update on the fishery since the 3rd surveillance audit. This audit followed the surveillance audit process as defined in the MSC Fishery Certification Requirements v2.0. All conditions were closed prior to this 4th audit, and no new conditions were raised.

MRAG Americas confirms that the New Zealand Orange Roughy Fishery continues to meet the MSC Fisheries Standard and shall remain certified following the completion of this surveillance. No changes in the fishery occurred that would adversely affect the certification of orange roughy.

# 3 Report details

## 3.1 Surveillance information

**Table 1 Surveillance information**

| | | |
|---|---|---|
| 1 | Fishery name | |
| | New Zealand Orange Roughy | |
| 2 | Surveillance level and type | |
| | Level 4, off-site audit, due to pandemic-related travel restrictions | |
| 3 | Surveillance number | |
| | 1st Surveillance | |
| | 2nd Surveillance | |
| | 3rd Surveillance | |
| | 4th Surveillance | X |
| | Other (expedited etc.) | |
| 4 | Team leader | |
| | Amanda Stern-Pirlot | |
| 5 | Team members | |
| | André Punt and Bob Trumble<br><br>A discussion between team members regarding conflict of interest and biases was held and none were identified. | |
| 6 | Audit/review time and location | |
| | Remotely via video conference on Nov 1-4, 2021 held in conjunction with the reassessment site visit. | |
| 7 | Assessment and review activities | |
| | The surveillance reviewed changes in science and management since the last annual audit. | |

## 3.2 Background

Update on the fishery since the 3rd surveillance audit.

### 3.2.1 Target stocks update

#### 3.2.1.1 Updated stock assessments - general

A new stock assessment for ORH 3B ECSR was conducted during 2020 (Cordue, 2021; FNZ, 2021) that updated the assessments conducted in 2018 and 2019 (Dunn and Doonan, 2018; Cordue, 2018) (FNZ, 2021a). The 2020 assessment did not, however, contain new abundance or composition data because the acoustic biomass surveys of the Chatham Rise scheduled for June/July 2020 were not undertaken, principally due to intervention of COVID-19 and reduced access to survey platforms. Rather, the update assessment included new catch information, with the last estimate of abundance being from 2016. The acoustic biomass surveys for the Chatham Rise were undertaken during June/July 2021 (Anon, 2021). The surveys took place aboard the FV *Amaltal Apollo*. Surveying was completed on the NWCR and had commenced in ESCR when engine problems meant the vessel had to return to port before survey completion. Two other vessels in the area, *Amaltal Mariner* and *San Waitaki*, subsequently undertook acoustic snapshots of the key spawning aggregations in ESCR, some of which have been assessed as being acceptable for biomass estimation once their echosounders have been calibrated. The provisional results from the surveys were reported to FNZ's Deep Water Working Group It has been agreed that the two surveys should be repeated during June-July 2022.

An assessment of ORH 3B NWCR was planned to be undertaken during 2021, but this did not take place. Assessments for ORH 3B NWCR and ESCR are planned for May 2022. The next assessment of ORH7A is scheduled for 2023 (FNZ, 2021b).

#### 3.2.1.2 Catches and Management changes

The 2019-20 orange roughy catch for ORH 3B NWCR was 223[1]t (TACC 1,150t), that for ORH 3B ESCR was 4,769[2]t (TACC 4,775t), and that for ORH 7A was 1,897t (TAC 2,058t). Unstandardized catch rates (t/tow) are not used in the assessment but are reported for information purposes, and previous assessments have reported standardized catch rates. The unstandardized catch rates for the 2019-20 fishing season in ORH 3B ESCR were well below (<50%) their 10-year averages for several fishing grounds (Andes, Spawning Box, Big Chief, and Rekuho), with no fishing ground having a catch rate markedly higher than the 10-year average (FNZ, 2021a). These catch rates should be interpreted with some caution owing to the small numbers of tows for some areas and years. However, the decline in catch rate for Rekuho is noteworthy given the large proportion of the total ORH 3B ECSR catch from this area. There would be value for next assessment in reporting changes in standardized catch rate given the trends in unstandardized catch rate are unexpected for a stock that is estimated to have been increasing over the last 10 years. CPUE data are not available for ORH 7A.

During 2020, Fisheries New Zealand provided advice to set the TACC for 2020-21 based on Option 3 as agreed by the Minister of Fisheries in 2018 (FNZ, 2020a). 1,935 comments on the options for the changes in TACC were received, including from the Deep Sea Conservation Coalition, Deepwater Group Ltd, Fisheries Inshore New Zealand Ltd, the Iwi Collective Partnership, Mike Currie, Ours Sea Our Future, Sealord Group Ltd, Te Awawa Fisheries, Te Kupenga o Maniapoto Limited, and Te Ohu Kaimoana (FNZ, 2020b). Several of the commenters noted that the lack of a 2020 survey. The Minister agreed with the recommendation from FNZ and set the TAC for ORH 3B to 8,355t (TACC 7,967t), with catch limits of 1,150t for the NWCR and 5,970t for the ESCR (Minister of Fisheries, 2020). The TACC selected by the Minister was larger than the presented in FNZ (2020a) owing to an error in calculating the TACCs from the HCR (FNZ, 2020b).

#### 3.2.1.3 Updated stock assessments – ORH 3B

The most recent stock assessment for ORH 3B ECSR was conducted during 2020 (Cordue, 2020), which updated assessments conducted in 2018 and 2019 (Dunn and Doonan, 2018; Cordue, 2018) (FNZ, 2021a). The 2020 and earlier stock assessments were based on CASAL (Bull *et al.*, 2012). These assessments were based on a single-sex, age-structured model that tracked mature and immature animals separately. There were four fisheries (Spawning Box & flats, Eastern Hills, Andes, and South Rise) in the 2020 assessment. Given lack of data for the South Rise, selectivity for the fishery on the South Rise was assumed to be the same as that for the fishery on the Andres. Spawning was assumed to occur after 75% of natural mortality and 100% of mature fish were assumed to spawn each year. The 2020 assessment

[1] 342t according to the Plenary Report which is based on estimated catches.
[2] 4,684t according to the Plenary Report which is based on estimated catches.

estimated year-class strengths from 1930 to 2002. Natural mortality was set to 0.045yr$^{-1}$ and stock-recruit steepness to 0.75.

The model was fitted to biomass estimates from Old-plume (in the Spawning Box; 2002-2014; 2016), Rekohu (2011-2014; 2016), and the Crack (2012, 2013, and 2016), trawl survey indices of biomass; age-frequencies from the spawning areas (2012, 2013, and 2016); length-frequencies from the trawl surveys; and catch length-frequencies. Acoustic surveys of orange roughy have been conducted in the ECSR region since 1996, but there has been a lack of consistency. Therefore, the time-series for the Old plume were only included in the assessment from 2002. Time-series of acoustic estimates of biomass are available for the Rekohu plume (only first noticed in 2010 and first surveyed in 2011) and the Crack. Rekohu and the Crack need to be surveyed using a towed-body or trawl-mounted system whereas the Old plume can be surveyed using a hull-mounted system. The estimates used in the 2014, 2018, 2019 and 2020 assessments were all obtained using 38 kHz transducers for comparability.

A key question evaluated in 2014 assessment was how long the Rekohu plume had been in existence – if it had always existed the Old plume index would be a consistent index of biomass but if it formed recently survey catchability for the Old plume would be time-varying. The assessment is based on the assumption that the Old plume cannot be relied on to provide a consistent index of abundance. Thus, the acoustic estimates (Table 2) were treated as follows:

- The estimates for 2011, 2012 and 2016 were summed to provide a combined index. The prior for the acoustic $q$ was based on the assumption that “most” (80%) of the spawning biomass was surveyed, leading to a prior $q_1 \sim$ LN(0.8, 0.19).
- The 2012 and 2014 estimates for Rekohu and the Old plume were summed to provide two comparable indices. The prior for acoustic $q$, $q_2 \sim$LN(0.7, 0.30) for these indices was based on the proportion of total biomass in 2011, 2012 and 2016 in these areas and that 80% of the biomass was surveyed in these years across all three areas.
- The Old plume indices for 2002-2010 were each assigned a prior. These priors were based on assuming that the mean of the prior for survey $q$ for 2002 was 0.7 (the Rekohu plume did not exist and excluding biomass on the Crack) and the mean for the survey $q$ prior in 2010 was 0.3, with a linear change in the mean of the acoustic $q$ prior between 2002 and 2010. The CV for these priors was 0.3.

The trawl indices for the Spawning Box (1986-1994) were computed based on a consistent area. The indices for each vessel were assigned a separate $q$ (with uninformative priors) and treated as independent indices. The surveys in 2004 and 2007 covered a wider area (from the western edge of the Spawning Box to around the northern edge of the Andes) but did not survey the Old plume, the Northeast Hills or the Andres. These indices were also fitted as measures of relative biomass with uninformative priors on $q$.

**Table 2 Acoustic estimates (and CVs in parenthesis) of average pluming spawning biomass in the three main spawning areas as used in the assessment of ORH3B ESCR (all estimates were obtained from surveys on FV San Waitaki from 38 kHz transducers; each estimate is the average of several snapshots) and the trawl survey indices of abundance. (Source: Cordue, 2021)**

| Year | Old plume | Rekohu | Crack | Trawl surveys |
|---|---|---|---|---|
| 1984 | | | | 130,000 (0.17)[1] |
| 1985 | | | | 111,000 (0.15)[1] |
| 1986 | | | | 77,000 (0.16)[1] |
| 1987 | | | | 60,000 (0.15)[1] |
| 1988 | | | | 73,000 (0.25)[2] |
| 1989 | | | | 54,000 (0.18)[2] |
| 1990 | | | | 34,000 (0.19)[2] |
| 1992 | | | | 22,000 (0.34)[3] |
| 1994 | | | | 61,000 (0.67)[3] |
| 2002 | 63,950 (0.06) | | | |
| 2003 | 44,316 (0.06) | | | |
| 2004 | 44,968 (0.08) | | | 16,878 (0.10)[4] |
| 2005 | 43,968 (0.04) | | | |
| 2006 | 47,450 (0.10) | | | |
| 2007 | 34,427 (0.05) | | | 17,000 (0.13)[4] |
| 2008 | 31,668 (0.08) | | | |
| 2009 | 28,199 (0.05) | | | |
| 2010 | 21,205 (0.07) | | | |
| 2011 | 16,422 (0.08) | 28,113 (0.18) | 6,794 (0.21) | |
| 2012 | 19,392 (0.07) | 27,212 (0.10) | | |
| 2013 | 15,554 (0.14) | 33,348 (0.10) | 5,471 (0.16) | |
| 2014 | 19,360 (0.18) | 44,421 (0.25) | | |
| 2016 | 11,192 (0.13) | 27,027 (0.13) | 5,341 (0.10) | |

1: *FV Otago Buccaneer*; 2: *FV Cordella*; 3: *FV Tangaroa. FV Tangaroa* wide-area surveys

### 3.2.1.3.1 Assessment results

The assessment involved a base model run and several sensitivity tests. The base model (denoted the 'updated model' by FNZ [2021a]) thus matches the assumptions of the 2018 base model. Two sensitivity analyses are reported in FNZ (2021a). The 'q-ratio model' places a prior on the ratio $q_1/q_2$ of LN(1.14=0.8/0.7,0.075) to encourage the $q_1/q_2$ ratio to exceed 1. This model only considered a single fishery. There was no agreement in the DWWG as to whether the updated base model or the q-ratio model was to be preferred (FNZ, 2021a). The second sensitivity analysis ('Low *h*-high *q*') involved increasing the means of the priors for acoustic *q* by 20% and reducing the value of *M* by 20% (from 0.045yr$^{-1}$ to 0.036yr$^{-1}$).

The models fitted the data well (FNZ, 2021a; Cordue, 2021), although the posterior for the ratio $q_1/q_2$ for the base model was 0.39, which seems unlikely. Nevertheless, adding a prior on $q_1/q_2$ does not lead to markedly more optimistic results ($B_{2020}/B_0$ of 0.38 [95% CI 0.32-0.44] compared 0.36 [0.30-0.41]) (

Table 3). The estimate of $B_0$ from the updated assessment is (as expected) essentially identical to that from the 2018 and 2014 assessments, although the updated model suggests a further increase in biomass (a posterior for $B_{2020}/B_0$ of 0.36 [95% CI 0.30-0.41] compared to a posterior for $B_{2017}/B_0$ of 0.33 [95% CI 0.28-037] from the 2018 assessment and a posterior for $B_{2014}/B_0$ of 0.30 [95% CI 0.25-0.34]). There are, however, no additional data beyond those used in the 2018 assessment.

The spawning biomass shows a decline in biomass from the start of the fishery to around 1991, followed by stability and then an increase in biomass starting around 2010. The stock is assessed never to have dropped below the soft limit of $0.2B_0$ (Figure 1). Fishing intensity was above those corresponding to lower bound of management target range for most of the years from the start of the fishery to 1994 and then again from 2002 to 2009. Fishing intensity since 2011 has been at or below that corresponding to the upper bound of the management range (Figure 2 and Figure 3).

**Table 3 MCMC estimates of virgin biomass (B0) and stock status (B2020 as %B0) for the base model and two sensitivity runs for ORH3B ESCR (source: FNZ, 2021a).**

| Run | $M$ | $B_0$ (1,000t) | $B_{2020}$ (000') | $B_{2020}$ (%$B_0$) |
|---|---|---|---|---|
| Current model | 0.045 | 312 (281-346) | 111 (91-135) | 36 (30-41) |
| q-ratio mode | 0.045 | 354 (331-380) | 135 (109-164) | 38 (32-44) |
| Low $M$-high $q$ | 0.036 | 337 (308-363) | 90 (71-111) | 27 (22-32) |

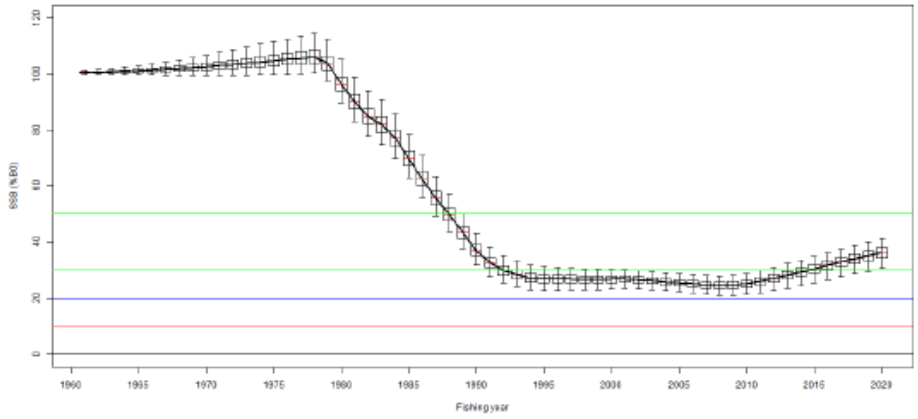


**Figure 1 ESCR current model, MCMC estimated spawning-stock biomass trajectory. The box in each year covers 50% of the distribution and the whiskers extend to 95% distribution. Horizontal lines are plotted at the hard limit (0.1B0), the soft limit (0.1B0), and the biomass target range (0.3-0.5B0). (Source: FNZ, 2021a).**

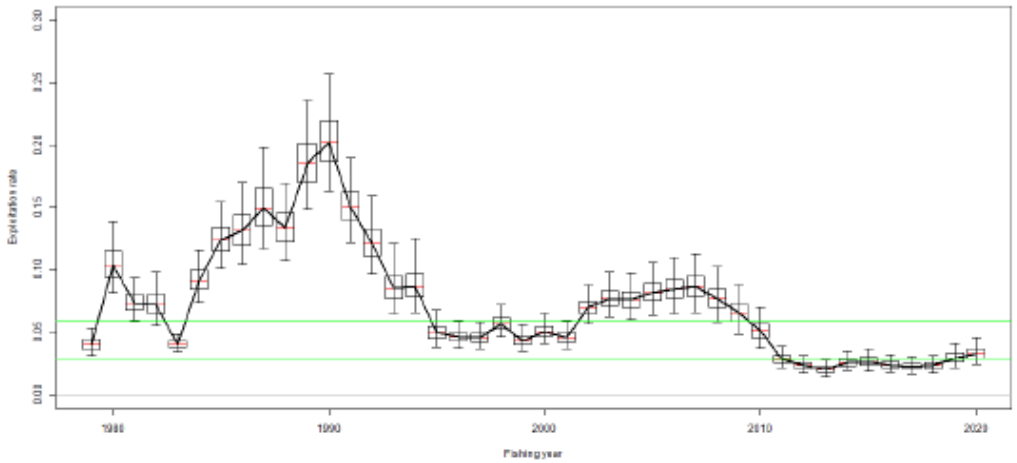


**Figure 2 ESCR current model, MCMC estimated exploitation rates. The box in each year covers 50% of the distribution and the whiskers extend to 95% of the distribution. The exploitation rates associated with the biomass target of 0.3-0.5B0 are marked by horizontal lines at U30%B0 and U50%B0. (Source: FNZ, 2021a).**

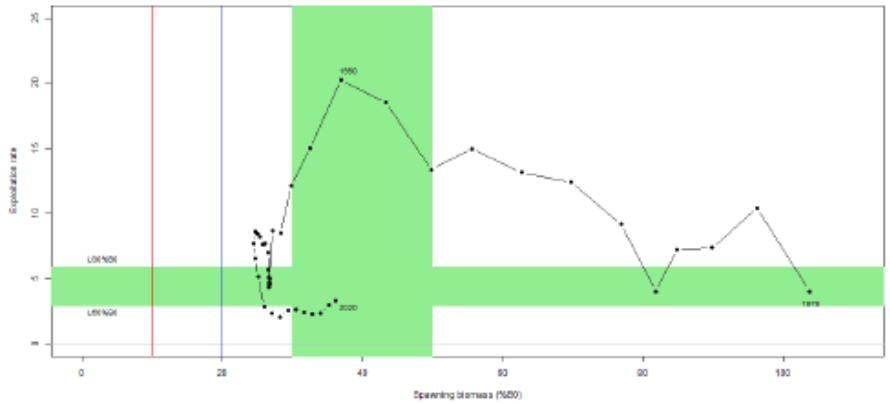

**Figure 3 Historical trajectory of spawning biomass (%B0) and exploitation rate (%) for ESCR (current model, medians of the marginal posteriors). The biomass target range of 0.3-0.5B0 and the corresponding exploitation rate range are marked in green. The soft limit (0.2$B_0$) is marked in blue and the hard limit (0.1$B_0$) in red. (Source: FNZ, 2021a).**

### 3.2.1.3.2 Projections

Projections at the recommended catch limits (plus 5% to allow for incidental mortality) were performed for the update model and the q-ratio model. The highest of the two catch limits was used in a projection for the Low *M*-high *q* model. Projections were done over 8 years because the HCR is meant to be applied every four years. Random recruitment was brought in from 1991 by resampling from the last ten years of estimated year class strengths (1981–1990). Both projections led to a predicted increase in biomass from 2020 to 2019 (FNZ, 2021b).

### 3.2.1.3.3 Application of the HCR

The orange roughy HCR was applied to results of the updated base model and the q-ratio model (Table 4). The resulting catch limits are quite similar as the higher exploitation rate for the q-ratio model is balanced by a lower vulnerable biomass.

**Table 4 The estimated stock status in 2019–20, the catch-weighted vulnerable biomass at the start of 2020–21, and the associated exploitation rate and recommended catch limit from the HCR for the current model and the q-ratio model. (Source: FNZ, 2021a)**

| Model | Stock status (%$B_0$) | Exploitation rate | Vulnerable biomass (t) | Catch limit (t) |
|---|---|---|---|---|
| Update model | 36 | 0.04050 | 156,735 | 6,348 |
| q-ratio | 38 | 0.4274 | 146,977 | 6,283 |

### 3.2.1.4 Recommendations:

Provide the catch-rate trends for ORH7A in future reports.

## Principle 1 References

Anon. 2021. Voyage Programme: Acoustic Biomass Surveys of Orange Roughy and benthic biodiversity camera trials in ORH 3B North Chatham Rise. 20pp,

Bull, B, Francis, R.I C.C, Dunn, A., McKenzie, A., Gilbert, D.J., Smith, M.H., Bian, R. & Fu, D (2012). CASAL (C++ algorithmic stock assessment laboratory): CASAL user manual v2.30-2012/03/21. *NIWA Technical Report 135*. 280 pp.

Cordue, P.L. (2018) A brief update of the ORH3B ESCR and NWCR stock assessments to the end of the 2016–17 and 2017–18 fishing years with application of the Harvest Control Rule in both years. ISL Client Report for Deepwater Group Ltd. 59 p. (Unpublished report held by Fisheries New Zealand, Wellington.)
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Dunn, M.R. & Doonan, I.J. (2018). Assessment of the Chatham Rise orange roughy stocks for 2017. *New Zealand Fisheries Assessment Report 2018/59*. 60pp.
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FNZ (2020b). Review of Sustainability Measures for selected stocks for 1 October 2020. Fisheries New Zealand Decision Paper. 287pp.
FNZ. (2021a). Orange Roughy, Chatham Rise and Southern New Zealand (ORH 3B). Fishery Assessment Plenary. May 2021 Stock Assessments and Stock Status. Volume 2: Hoki to Redbait. pp. 869-907.
FNZ. (2021b). Orange Roughy, Challenger Plateau (ORH7A). Fishery Assessment Plenary. May 2021 Stock Assessments and Stock Status. Volume 2: Hoki to Redbait. pp. 869-907.
Minister of Fisheries (2020). Changes to sustainability measures and other management controls for 1 October 2020. 18 p.

### 3.2.2 Ecosystem update

**Retained species and bycatch**

QMS stocks are considered as “primary species” when they have reference point management. “Secondary species” are QMS species with no reference point management and for non-QMS species. The assessment team considered main species as those that make up ≥5% of the total catch in a UoA, except for vulnerable species that reach or exceed 2% of the total catch; in an effort to accommodate stakeholder requests during the original assessment (MRAG Americas, 2016), the assessment team made an additional exception for shark species, which are considered main at ≥1% of the total catch. Species less abundant than main species but ≥0.5% of the catch are considered as minor species. Species less than 0.5% are considered *di minimis* and not considered further, because the catch amounts to a few tens of tons. Species < 0.05% of the total catch are presented in the aggregate, not individually.

Catch composition by weight for each of the three UoAs was determined based on observer sampling data sourced from FNZ for the five-year period 2015-16 to 2019-20. The observer catches may be scaled up to estimated total catch by dividing by the observer coverage rate.

MPI provided updated catch compositions of QMS and non-QMS catches for the ORH 3B ESCR, ORH 3B NWCR, and ORH 7A fisheries.

**ORH 3B NWCR**.

Targeted orange roughy trawl tows in the NWCR account for 54.2% of the total estimated catch by weight (**Table 5**). The elasmobranch with the highest catch is Baxter’s lantern dogfish (*Etmopterus baxteri)* = southern lanternshark *(Epmotterus granulosus*) at 1.0%, the only elasmobranch to reach Main status. Smooth oreo (QMS), unidentified rattails (a non-QMS fish), and Johnson’s cod (a non-QMS fish) exceeded 5% to reach Main status. Several species reached Minor status (**Table 5**). Smooth oreo is a Primary species, and the others Secondary species.

**Primary Species**
**Smooth Oreo**. An assessment of Smooth Oreo (*Pseudocyttus maculatus*; reporting code SSO) for the OEO4 management area, which overlaps the NWCR and ESCR UoAs, was conducted in. a 2019 and estimated $B_{2018}$ at $0.4B_0$ for the base model (FNZ, 2021). The assessment was based on a CASAL age-structured population model with Bayesian estimation, incorporating stochastic recruitment, life history parameters, and catch history up to 2017–18 (FNZ 2021). $B_{2018}$ is ‘About as Likely as Not (40-60%)’ to be at or above the management target of $0.4B_0$. Stock projections indicate there would be little change in biomass over the next

five years at annual catches of 2,300 – 3,000 t (Cordue, 2019). The catch limit for SSO in OEO4 is currently 2,600 t (DWG, 2021).

For the base model, and all of the sensitivities, $B_0$ for *OEO4* was estimated at about 140,000 t with 95% CIs ranging from about 110,000 t to 210m000 t. Current stock status is estimated to be at the target level of 40% for the base case. However, it is estimated to be just above $0.3B_0$ for the LowM-Highq and Fixed M runs ( Table 6). For all of the runs the estimated probability of current stock status being below the soft limit of $0.2 B_0$ is less than 5%. The probability of current stock status being below the hard limit of $0.1B_0$ was estimated at 0 for all runs (Table 6).

The spawning biomass trajectory for the base model shows a decreasing trend from the start of the fishery in the 1980s with a flattening off in 2015–16 when catches were substantially reduced (Figure 4). Current stock status is estimated to be at the target biomass although the 95% CIs are very wide (Figure 4; Table 6).

**Secondary Species**

**Baxter's lantern dogfish**. Baxter's lantern dogfish is a small deepwater shark (to 88 cm total length), with a widespread but patchy distribution in the Southern Hemisphere (IUCN Redlist https://www.iucnredlist.org/species/116856245/3120311). It occurs on upper continental and insular slopes, and seamounts at depths of 220-1,500 m, but is more common at depths >600 m. Population size and trends for this species are unknown across most of its range, but the species is considered to have a relatively large population size in New Zealand, where recent data shows no trends in biomass indices (IUCN Redlist https://www.iucnredlist.org/species/116856245/3120311). Baxter's lantern dogfish is taken incidentally in benthic trawl and longline artisanal and commercial fisheries throughout its range. At this time, there are no species-specific management actions in place for Baxter's lantern dogfish; however, fisheries closures and restrictions in the Tasman Sea may indirectly offer this species some refuge, particularly in deeper waters. There is nothing to infer population decline at this time and the species is assessed as Least Concern by IUCN.

Baxter's lantern dogfish has a high overlap with the New Zealand deepwater trawl fisheries for Orange Roughy and Smooth Oreo. It is strongly associated with seamounts, potentially increasing its susceptibility to capture. A qualitative risk assessment for New Zealand's chondrichthyans (FNZ 2018) ranked this species as one of the highest species at risk from commercial fishing that is not managed by the Quota Management System (QMS) , and a semi-quantitative risk assessment for chondrichthyan bycatch species taken in the Southeast Shark and Scalefish Fishery ranked this species with moderate risk from commercial fishing.

New Zealand mid-and deep-water trawl surveys cover areas outside of the fishing grounds and also collect length and maturity stage data for deepwater sharks and other non-QMS species (Stevens *et al.,* 2018). In spite of the low-medium productivity of deepwater sharks (e.g., PSA Productivity score = 2.57 for Baxter's dogfish), Blackwell (2010) reviewed trawl survey data to conclude that deepwater sharks appear to be relatively resilient to the levels of fishing effort associated with the target hoki and orange roughy fisheries on the Chatham Rise.

Blackwell (2010) reviewed research trawl survey estimates for core hoki depths (600-800 m) and deeper waters (750-1,500 m) on the Chatham Rise. Over the course of the 1990s to 2006, Baxter's lantern dogfish ranged in annual estimated abundance from 6,000 to 12,000 t, consisting of 800-2,000 t in the core hoki depth, 200-700 t on the Northwest Chatham Rise, 200-700 t on the Northeast Chatham Rise, and 5,000-10,000 t on the South Chatham rise. Stevens *et al.* (2018) reported similar amounts in the hoki core depth and the deep zone, excluding the South Chatham Rise, and present figures of trawl estimates of abundance for several deepwater dogfish, including Baxter's dogfish, that show no temporal pattern (Figure 5). Stevens *et al.* (2018) further demonstrate that the length frequency of these dogfish extends up to lengths expected for the adult sizes. For example, observed Baxter's dogfish reach lengths at and beyond 75 cm, the theoretical expected maximum length for the species. This demonstrates that the adult component has not been fished down. The lower lengths observed, to 20 cm, demonstrate that recruiting year classes are entering the stock.

**Rattails**. The IUCN has graded rattails in gerneral as Least Concern (https://www.iucnredlist.org/search?query=Rattails&searchType=species). This grading includes the four-rayed rattail, *Corphaenoides subserrulatus* (https://www.iucnredlist.org/species/154890/115249673), which is commonly found in trawl surveys in New Zealand. This species is known to be of minor commercial importance; however, it does comprise a large percentage of by-catch in some regions. In combination with the deep-water nature of this species, these threats are not known across the entire distribution range and so are not likely to be causing a significant population decline at present due the broad range of distribution beyond the fishing areas. Monitoring of the harvest levels of this species is needed so that any potential change in conservation status can be noted.

The genus Coryphaenoides includes some of the most commercially important species of Macrouridae. This species is of minor commercial importance; however, it does comprise a large percentage of the by-catch in areas such as Tasmania, Australia. Intense exploitation of fishery resources off the coast of Argentina may have impacted this species there. While this species may have undergone declines in parts of its range, these threats are unlikely to have significantly impacted the global population of this broad ranging species.

Relative abundance of four-rayed Bollon's rattails, as observed in the trawl surveys showed no temporal patterns (Figure 6).

**Johnson's cod**. *Halargyreus johnsonii* is circumglobally distributed, with an anti-tropical distribution in the Atlantic and Pacific Oceans. It is found at depths ranging from 450 to 3,000 m over both hard and soft substrates, and has been associated with seamounts. There is little species-specific population information available. This species is taken as bycatch in mixed demersal trawl fisheries that operate within its depth distribution, however there are no indications that this is affecting the population. *Halargyreus johnsonii* is listed as Least Concern by the IUCN (https://www.iucnredlist.org/species/18126404/45142052). There are no known species-specific threats to *H. johnsonii*. It is taken as bycatch in deepwater demersal trawls. Landings of Johnson's cod are often combined with other species of Moridae.

Relative abundance of Johnson's cod, as observed in the Chatham Rise trawl surveys also showed no temporal patterns (Figure 7).

**Table 5. NWCR UoA composition of QMS and non-QMS catch based on observer data, 2015-16 to 2019-20 (R. Tinkler, FNZ pers. comm.). Only catches ≥0.5% of the total are provided. Shading represents Main, Minor (not main but more than 0.5%).**

| QMS species (excl. elasmobranchs) | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orange roughy | 162044 | 67.1% | 52568 | 35.3% | 165718 | 56.0% | 66075 | 45.3% | 138109 | 61.2% | **116902.8** | **55.2%** |
| Hoki | 2297 | 1.0% | 5590 | 3.8% | 13354 | 4.5% | 5334 | 3.7% | 1269 | 0.6% | **5568.8** | **2.6%** |
| Smooth oreo | 27872 | 11.5% | 12312 | 8.3% | 7983 | 2.7% | 4871 | 3.3% | 18710 | 8.3% | **14349.6** | **6.8%** |
| Hake | 911 | 0.4% | 1475 | 1.0% | 1915 | 0.6% | 718 | 0.5% | 250 | 0.1% | **1053.8** | **0.5%** |
| Cardinalfish | 132 | 0.1% | 9256 | 6.2% | 26 | 0.0% | 10 | 0.0% | 65 | 0.0% | **1897.8** | **0.9%** |
| Others <0.5% | | | | | | | | | | | **1218.0** | **0.6%** |
| **Sector totals** | **193867** | **80.3%** | **83843** | **56.3%** | **190790** | **64.5%** | **77174** | **52.9%** | **159280** | **70.5%** | 140990.8 | 66.6% |
| | | | | | | | | | | | | |
| **Elasmobranchs** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Baxters lantern dogfish | 5530 | 2.3% | 2572 | 1.7% | 1578 | 0.5% | 2 | 0.0% | 830 | 0.4% | **2102.4** | **1.0%** |
| Seal shark | 1282 | 0.5% | 494 | 0.3% | 1284 | 0.4% | 1648 | 1.1% | 2360 | 1.0% | **1413.6** | **0.7%** |
| Long-nosed chimaera | 1178 | 0.5% | 1708 | 1.1% | 3018 | 1.0% | 2504 | 1.7% | 996 | 0.4% | **1880.8** | **0.9%** |
| Widenosed chimaera | 738 | 0.3% | 1340 | 0.9% | 2303 | 0.8% | 89 | 0.1% | 815 | 0.4% | **1057** | **0.5%** |
| Shovelnose spiny dogfish | 521 | 0.2% | 1083 | 0.7% | 1832 | 0.6% | 1088 | 0.7% | 1493 | 0.7% | **1203.4** | **0.6%** |
| Deepwater dogfish | 126 | 0.1% | 3602 | 2.4% | 2525 | 0.9% | 1712 | 1.2% | 225 | 0.1% | **1638** | **0.8%** |
| Others <0.5% | | | | | | | | | | | **6881.0** | **2.3%** |
| **Sector totals** | **12153** | **5.0%** | **16778** | **11.3%** | **22278** | **7.5%** | **7987** | **5.5%** | **11173** | **4.9%** | 14073.8 | 6.6% |
| | | | | | | | | | | | | |
| **Non-QMS finfish** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Rattails - unidentified | 8572 | 3.5% | 19550 | 13.1% | 38776 | 13.1% | 40924 | 28.0% | 11244 | 5.0% | **23813.2** | **11.3%** |
| Johnson's cod | 7885 | 3.3% | 7790 | 5.2% | 12614 | 4.3% | 8089 | 5.5% | 17389 | 7.7% | **10753.4** | **5.1%** |
| Slickhead | 8854 | 3.7% | 15718 | 10.5% | 7782 | 2.6% | 5383 | 3.7% | 3722 | 1.6% | **8291.8** | **3.9%** |
| Smallscaled brown slickhead | 92 | 0.0% | | 0.0% | 4190 | 1.4% | | 0.0% | 1081 | 0.5% | **1072.6** | **0.5%** |
| Morid cods | 1415 | 0.6% | 75 | 0.1% | 3304 | 1.1% | 1062 | 0.7% | 512 | 0.2% | **1273.6** | **0.6%** |
| Javelin fish | 436 | 0.2% | 375 | 0.3% | 1527 | 0.5% | 1208 | 0.8% | 7506 | 3.3% | **2210.4** | **1.0%** |
| Others <0.5% | | | | | | | | | | | **1746.8** | **0.8%** |
| **Sector totals** | **28900** | **12.0%** | **44883** | **30.1%** | **70825** | **23.9%** | **57510** | **39.4%** | **43691** | **19.3%** | 49161.8 | 23.2% |
| | | | | | | | | | | | | |
| **Molluscs** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Warty squid | 983 | 0.0041 | 2427 | 0.016 | 3500 | 0.0118 | 734 | 0.005 | 1788 | 0.008 | **1886.4** | **0.9%** |
| Others <0.5% | | | | | | | | | | | **63.6** | **0.0%** |
| **Sector totals** | **996** | **0.0041** | **2480** | **0.017** | **3682** | **0.0124** | **751** | **0.0051** | **1841** | **0.008** | 1950 | 0.9% |
| | | | | | | | | | | | | |
| **Crustaceans** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | 33.42 | 0.0% |
| **Sector totals** | **6.1** | **0.0%** | **38** | **0.0%** | **32** | **0.0%** | **0** | **0.0%** | **91** | **0.0%** | **33.42** | **0.0%** |
| | | | | | | | | | | | | |
| **Other invertebrates** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Starfish | 3130 | 1.3% | 318 | 0.2% | 35 | 0.0% | 730 | 0.5% | 7440 | 3.3% | **2330.6** | **1.1%** |
| Others <0.5% | | | | | | | | | | | **785.4** | **0.4%** |
| **Sector totals** | **3514** | **1.5%** | **636** | **0.4%** | **3031.1** | **1.0%** | **818** | **0.6%** | **7581** | **3.4%** | 3116.0 | 1.5% |
| | | | | | | | | | | | | |
| **Coral** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **0** | **0.0%** |
| **Sector totals** | **99.4** | **0.0%** | **11.0** | **0.0%** | **7.2** | **0.0%** | **6** | **0.0%** | **5.3** | **0.0%** | 26 | 0.0% |
| | | | | | | | | | | | | |
| **Miscellaneous** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Rocks stones | 1944 | 0.8% | 317.3 | 0.2% | 4848 | 1.6% | 1720 | 1.2% | 2163 | 1.0% | 2198.5 | 1.0% |
| Others <0.5% | | | | | | | | | | | 117.9 | 0.1% |
| **Sector totals** | **1957** | **0.8%** | **377.8** | **0.3%** | **5338.5** | **1.8%** | **1734** | **1.2%** | **2174.5** | **1.0%** | 2316.4 | 1.1% |
| | | | | | | | | | | | | |
| **Grand Total** | **241492.5** | **100%** | **149047** | **100%** | **295984** | **100%** | **145980** | **100%** | **225837** | **100%** | 211668 | 100% |

**Table 6**. Bayesian estimates of M, $B_0$, and current stock status ($B_{18}/B_0$) for the smooth oreo base model and sensitivities (the median and 95% CIs are given). The probability of current stock status being below 10% or 20% $B_0$ is also given (FNZ, 2021).

| | M ($yr^{-1}$) | $B_0$ (000 t) | $ss_{18}$ (%$B_0$) | P($ss_{18}$ < 10%) | P($ss_{18}$ < 20%) |
|---|---|---|---|---|---|
| **Base** | 0.079 (0.057–0.01) | 138 (111–184) | 40 ((23–59) | 0.00 | 0.01 |
| **LowM-Highq** | 0.0632 | 138 (118–173) | 31 ( 19–46) | 0.00 | 0.04 |
| **HighM-Lowq** | 0.0948 | 146 (111–208) | 50 ( 33–67) | 0.00 | 0.00 |
| **Incl. LFs** | 0.085 (0.067–0.011) | 133 (111–172) | 42 ( 26–60) | 0.00 | 0.00 |
| **Fixed M** | 0.063 | 143 (121–184) | 33 ( 21–50) | 0.00 | 0.02 |

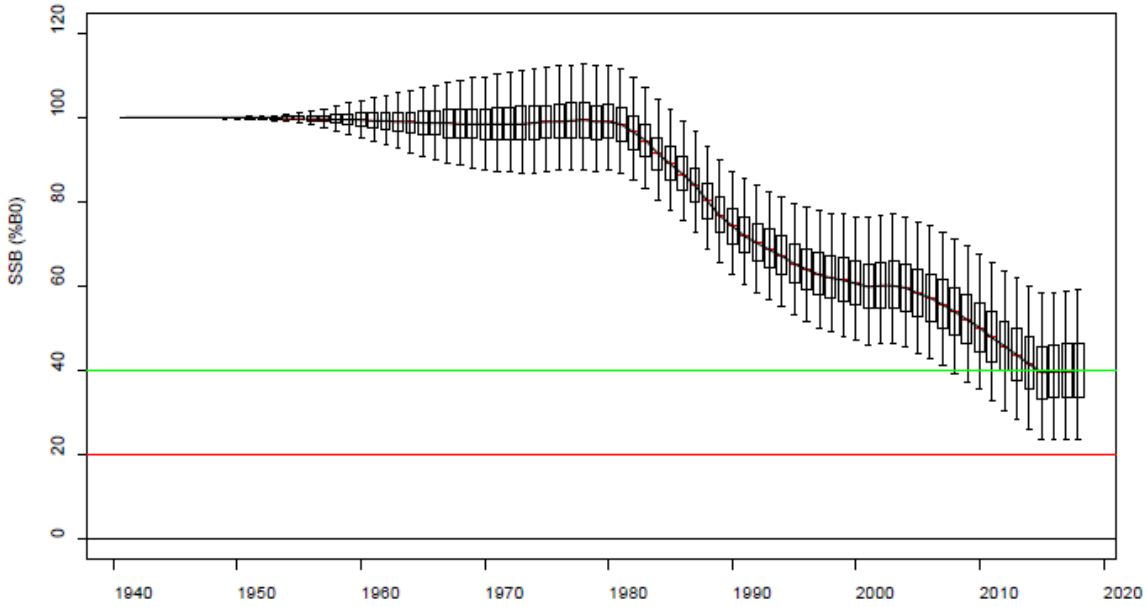



**Figure 4.** Base, MCMC-estimated Chatham Rise smooth oreo spawning-stock biomass trajectory. The box in each year covers 50% of the distribution and the whiskers extend to 95% of the distribution. The soft limit (red) and target biomass (green) are marked by horizontal lines (FNZ, 2021).

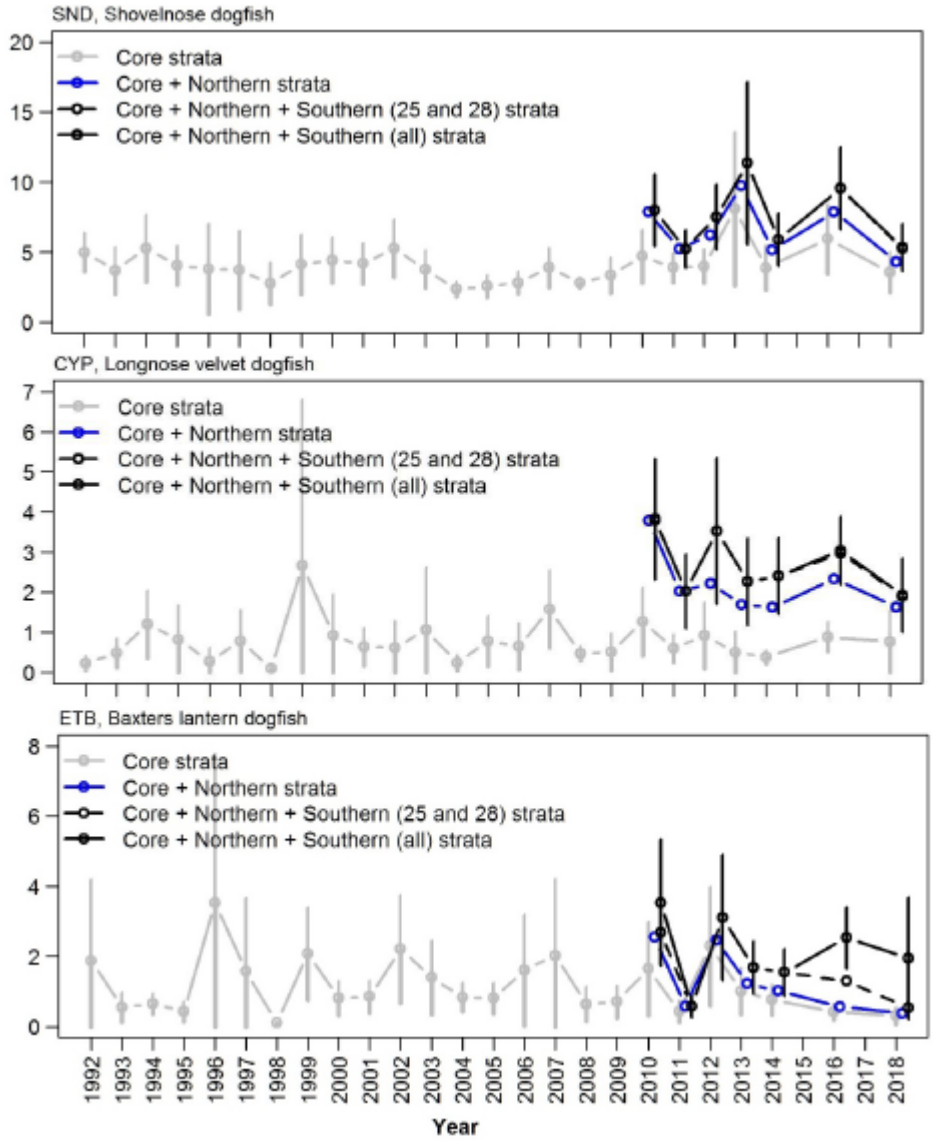



**Figure 5** Relative biomass estimates (thousands of tonnes) of selected deepwater dogfish sampled by annual trawl surveys of the Chatham Rise, January 1992–2018. Black lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1,300 m) strata. Error bars show ± 2 standard errors (Stevens *et al.*, 2018).

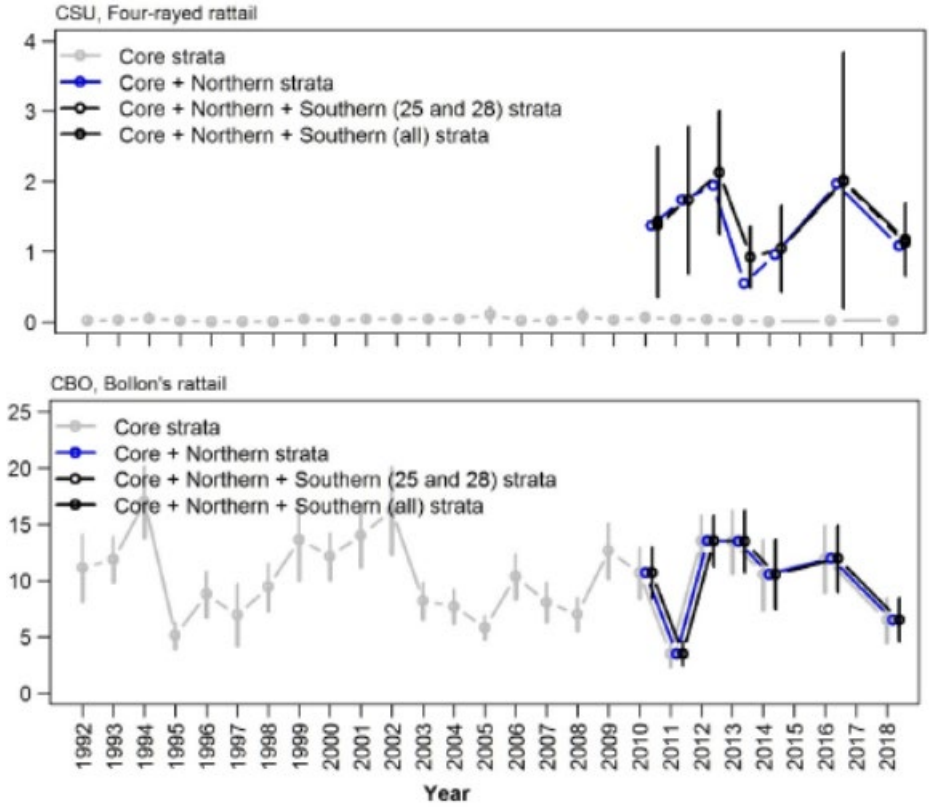



**Figure 6.** Relative biomass estimates (thousands of tonnes) of selected rattail sampled by annual trawl surveys of the Chatham Rise, January 1992–2018. Black lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1,300 m) strata. Error bars show ± 2 standard errors (Stevens *et al.*, 2018).

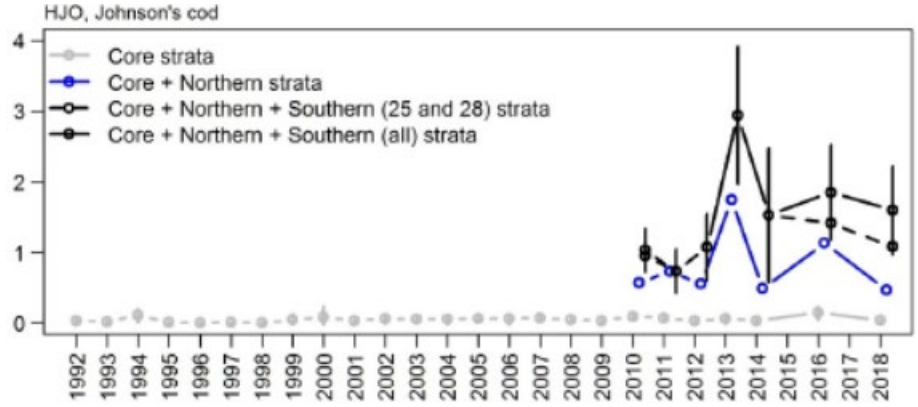



**Figure 7.** Relative biomass estimates (thousands of tonnes) of Johnson's cod sampled by annual trawl surveys of the Chatham Rise, January 1992–2018. Black lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1,300 m) strata. Error bars show ± 2 standard errors (Stevens *et al.*, 2018).

**ORH 3B ESCR**.

Orange roughy in targeted orange roughy trawl tows for the ESCR account for 83.3% of the total estimated catch by weight (**Table 7**). The next-most abundant QMS species is smooth oreo at 8.8% of the catch, followed by black oreo at 0.9%. No other QMS species make up more than 0.5% of the catch. Other species reaching at least 0.5% are other sharks and dogfish, slickheads, and Johnson's cod, all below the threshold for Main species (**Table 7**). No other single species exceeds 0.5% of the overall catch.

**Table 7. ESCR UoA composition of QMS and non-QMS catch based on observer data, 2015-16 to 2019-20 (R. Tinkler, FNZ pers. comm.). Only catches ≥0.05% of the total are provided. Shading represents Main, Minor, not minor but more than 0.05%.**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Observer coverage | 0.56 | | 0.27 | | 0.03 | | 0.28 | | 0.3 | | | |
| | | | | | | | | | | | | |
| QMS species (excl. elasmobranchs) | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Orange roughy | 1814528 | 75.8% | 962163 | 75.6% | 468397 | 97.9% | 2076191 | 89.9% | 1551389 | 86.5% | 1374534 | 83.3% |
| Smooth oreo | 361762 | 15.1% | 165862 | 13.0% | 102 | 0.0% | 120539 | 5.2% | 74415 | 4.1% | 144536 | 8.8% |
| Black oreo | 47269 | 2.0% | 4013 | 0.3% | 46 | 0.0% | 14899 | 0.6% | 10070 | 0.6% | 15259 | 0.9% |
| Others <0.5% | | | | | | | | | | | 179304 | 1.2% |
| Sector totals | 2234799 | 93.4% | 1157243 | 91.0% | 474268 | 99.2% | 2246950 | 97.3% | 1655926 | 92.3% | 1553837 | 94.2% |
| | | | | | | | | | | | | |
| Elasmobranchs | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Other sharks and dogs | 41848 | 1.7% | 2210 | 0.2% | | 0.0% | 7028 | 0.3% | 7019 | 0.4% | 11621 | 0.7% |
| Others <0.5% | | | | | | | | | | | 26736 | 1.6% |
| Sector totals | 88968 | 3.7% | 39208 | 3.1% | 2196 | 0.5% | 32478 | 1.4% | 28934 | 1.6% | 38357 | 2.3% |
| | | | | | | | | | | | | |
| Non-QMS finfish | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Slickhead | 22216 | 0.9% | 22568 | 1.8% | 23 | 0.0% | 6127 | 0.3% | 10185 | 0.6% | 12224 | 0.7% |
| Johnson's cod | 10059 | 0.4% | 30447 | 2.4% | | 0.0% | 6745 | 0.3% | 20015 | 1.1% | 13453 | 0.8% |
| Others <0.5% | | | | | | | | | | | 19966 | 1.2% |
| Sector totals | 55139 | 2.3% | 68061 | 5.3% | 1341 | 0.3% | 26926 | 1.2% | 76750 | 4.3% | 45643 | 2.8% |
| | | | | | | | | | | | | |
| Molluscs | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Others <0.5% | | | | | | | | | | | 6903.6 | 0.4% |
| Sector totals | 2034 | 0.1% | 3512 | 0.3% | 441 | 0.1% | 1262 | 0.1% | 27269 | 1.5% | 6903.6 | 0.4% |
| | | | | | | | | | | | | |
| Crustaceans | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Others <0.5% | | | | | | | | | | | 77 | 0.0% |
| Sector totals | 37 | 0.0% | 142 | 0.0% | | 0.0% | 79 | 0.0% | 127 | 0.0% | 77 | 0.0% |
| | | | | | | | | | | | | |
| Other Invertebrates | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Others <0.5% | | | | | | | | | | | 626.74 | 0.0% |
| Sector totals | 824.2 | 0.0% | 1462.8 | 0.1% | | 0.0% | 691.7 | 0.0% | 155 | 0.0% | 626.74 | 0.0% |
| | | | | | | | | | | | | |
| Corals | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Others <0.5% | | | | | | | | | | | 2252 | 0.1% |
| Sector totals | 10743 | 0.4% | 227 | 0.0% | | 0.0% | 45 | 0.0% | 242 | 0.0% | 2252 | 0.1% |
| | | | | | | | | | | | | |
| Miscellaneous | 2015-16 | | 2016/17 | | 2017/18 | | 2018/19 | | 2019/20 | | 5-yr average | |
| Others <0.5% | | | | | | | | | | | 1646 | 0.1% |
| Sector totals | 539 | 0.0% | 2435 | 0.2% | 0 | 0.0% | 508 | 0.0% | 4746 | 0.3% | 1646 | 0.1% |
| | | | | | | | | | | | | |
| Grand Total | 2393083 | 100.0% | 1272291 | 100% | 478246 | 100% | 2308940 | 100% | 1794149 | 100% | 1649342 | 100% |

## Primary Species

**Smooth Oreo**. Smooth oreo, with 8'8% of the total catch, is the only Main primary species. An assessment of Smooth Oreo for the OEO4 management area, which overlaps the NWCR and ESCR UoAs, was conducted in 2019 and estimated $B_{2018}$ at $0.4B_0$ for the base model (FNZ, 2021). $B_{2018}$ is 'About as Likely as Not (40-60%)' to be at or above the management target of $0.4B_0$. Stock projections indicate there would be little change in biomass over the next five years at annual catches of 2,300 – 3,000 t (Cordue, 2019). The catch limit for SSO in OEO4 is currently 2,600 t (DWG, 2021). The spawning biomass trajectory for the base model shows a decreasing trend from the start of the fishery in the 1980s with a flattening off in 2015–16 when catches were substantially reduced (Figure 4). Current stock status is estimated to be at the target biomass although the 95% CIs are very wide (Figure 4,
Table 6). See ORH 3B NWCR above for details.

Black oreo, at 0.9% of the total catch, is the only minor primary species.

**Secondary Species**
As none of the non-QMS, elasmobranch/chimaerid, invertebrate, or inanimate species or materials reached 5% of the total catch or 2% of the catch for vulnerable species (**Table 7**), so no main secondary species occur in ESCR.

**ORH 7A**

Targeted orange roughy trawl tows account for 90.6% of the total estimated catch by weight (**Table 8**). The next-most abundant QMS species is spiky oreo (*Neocyttus rhomboidalis*) at 1.8% of the catch followed by ribaldo (*Moro moro*) at 1.0% and hake at 0.5%.

The largest non-QMS finfish component is the rattail species complex, which makes up 1.1% of the catch followed by other sharks and dogfish at 0.9%. No other species met the requirements for minor species (**Table 8**).

**Table 8. 7A/WB UoA composition of QMS and non-QMS catch based on observer data, 2015-16 to 2019-20 (R. Tinkler, FNZ pers. comm.). Only catches ≥0.05% of the total are provided. Shading represents Main or P1, Minor, not minor but more than 0.05%.**

| Observer coverage | 0.43 | | 0.29 | | 0.56 | | 0.23 | | 0.35 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **QMS species (excl. elasmobranchs)** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Orange roughy | 599858 | 90.0% | 639342 | 87.9% | 1196028 | 88.6% | 691905 | 96.5% | 584015 | 0.916 | **742230** | **90.6%** |
| Spiky oreo | 16900 | 2.5% | 6181 | 0.8% | 37215 | 2.8% | 8618 | 1.2% | 5285 | 0.8% | **14840** | **1.8%** |
| Ribaldo | 7876 | 1.2% | 9398 | 1.3% | 13674 | 1.0% | 4346 | 0.6% | 6535 | 1.0% | **8366** | **1.0%** |
| Hake | 1241 | 0.2% | 7847 | 1.1% | 7606 | 0.6% | 811 | 0.1% | 3150 | 0.5% | **4131** | **0.5%** |
| Others <0.5% | | | | | | | | | | | **2083** | **0.3%** |
| **Sector Totals** | **629964** | **94.5%** | **663664** | **91.2%** | **1258612** | **93.3%** | **706369** | **98.6%** | **599635** | **94.0%** | **771649** | **94.2%** |
| | | | | | | | | | | | | |
| **Elasmobranchs** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Other sharks and dogs | 4317 | 0.6% | 8590 | 1.2% | 15887 | 1.2% | 385 | 0.1% | 345 | 0.1% | 5904.8 | 0.7% |
| Others <0.5% | | | | | | | | | | | 18392.8 | **2.2%** |
| **Sector Totals** | **23546** | **3.5%** | **29889** | **4.1%** | **45733** | **3.4%** | **6650** | **0.9%** | **15670** | **2.5%** | **24297.6** | **3.0%** |
| | | | | | | | | | | | | |
| **Non-QMS finfish** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Rattails | 4005 | 0.6% | 10102 | 1.4% | 25127 | 1.9% | 518 | 0.1% | 7198 | 1.1% | **9390** | **1.1%** |
| Others <0.5% | | | | | | | | | | | **11889** | **1.5%** |
| **Sector Totals** | **11391** | **1.7%** | **30355** | **4.2%** | **42210** | **3.1%** | **3057** | **0.4%** | **19384** | **3.0%** | **21279** | **2.6%** |
| | | | | | | | | | | | | |
| **Molluscs** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **1113.4** | **0.1%** |
| **Sector Totals** | **418** | **0.1%** | **1695** | **0.2%** | **1503** | **0.1%** | **193** | **0.0%** | **1758** | **0.3%** | **1113.4** | **0.1%** |
| | | | | | | | | | | | | |
| **Crustaceans** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **64.42** | **0.0%** |
| **Sector Totals** | **96** | **0.0%** | **15** | **0.0%** | **185** | **0.0%** | **2.1** | **0.0%** | **24** | **0.0%** | **64.42** | **0.0%** |
| | | | | | | | | | | | | |
| **Other invertebrates** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **839.8** | **0.1%** |
| **Sector Totals** | **392.9** | **0.1%** | **1719.1** | **0.2%** | **1382.5** | **0.1%** | **30.2** | **0.0%** | **674.3** | **0.1%** | **839.8** | **0.1%** |
| | | | | | | | | | | | | |
| **Corals** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **17.24** | **0.0%** |
| **Sector Totals** | **12.1** | **0.0%** | **33.1** | **5E-05** | **11.4** | **0.0%** | **21.7** | **0.0%** | **7.9** | **0.0%** | **17.24** | **0.0%** |
| | | | | | | | | | | | | |
| **Miscellaneous** | **2015-16** | | **2016/17** | | **2017/18** | | **2018/19** | | **2019/20** | | **5-yr Average** | |
| Others <0.5% | | | | | | | | | | | **297.2** | **0.0%** |
| **Sector Totals** | **508.1** | **0.1%** | **154** | **0.0%** | **47.7** | **0.0%** | **346** | **0.0%** | **430.2** | **0.1%** | **297.2** | **0.0%** |

## ETP Species

All fishing vessels are required by law to report all captures of Endangered, Threatened and Protected (ETP) species to the Ministry for Primary Industries on Non-Fish Protected Species forms (FNZ, 2019).

Information on incidental captures of ETP species, reported by vessels and by MPI observers, is summarised in the Aquatic Environment and Biodiversity Annual Review report (FNZ, 2020c), and for ETP species other than corals on MPI's Protected Species website (MPI, 2021). The latter provides open access to multi-year records of ETP species captures by fishery sector and fishing method, based on MPI observer data, and is updated annually through FNZ's Science Working Group process.

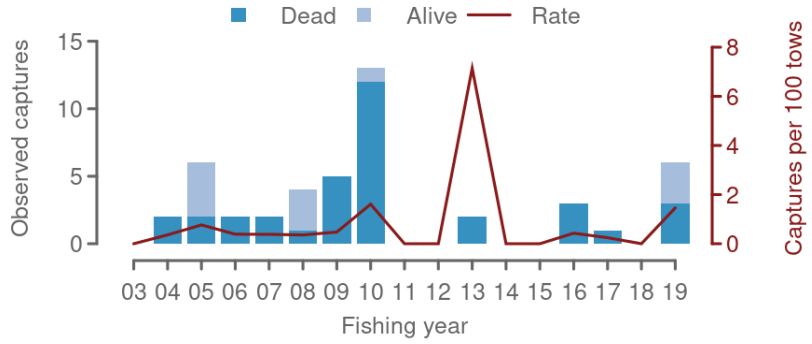
In addition to MPI's scientific observer programme, a range of management measures, including some industry-led, non-regulatory initiatives, are employed to monitor environmental interactions in deep water fisheries and to reduce the risk of any adverse effects on protected species populations. Responsibilities relating to the mitigation and monitoring of ETP species are described in DWG's Operational Procedures (DWG, 2021) and Vessel Management Plans for mitigating seabird captures. Ministry Operational Plans additionally prescribe mitigation requirements for application in fisheries at high risk of capturing ETP species. DWG employs an Environmental Liaison Officer (ELO) who visits factory vessels and fresh fish trawlers involved in all deepwater fisheries to provide assistance in assuring vessels comply with regulatory and non-regulatory requirements (Cleal, 2019, 2020). The orange roughy trawl fisheries are deemed to be low-risk in relation to captures of ETP seabirds, marine mammals and sharks.

*Seabirds and Marine mammals*
Orange roughy fishing vessels in the three orange roughy UoA catch relatively few seabirds or marine mammals (FNZ, 2020). All orange roughy fishing vessels >28 m are required to comply with regulations that ban the use of net sonde cables and require the deployment of devices to keep birds away from the fishing gear (FNZ, 2020). Industry standards, supported by MPI, require all orange roughy vessels to agree to a Vessel Management Plan that specifies the management of the disposal of fish waste to minimise it as an attractant to seabirds (DWG, 2020).

**Seabirds**
The NPOA Seabirds 2020 (https://www.mpi.govt.nz/dmsdocument/3962/direct#:~:text=The%20National%20Plan%20of%20Action,of%20seabirds%20in%20our%20fisheries.&text=The%20NPOA%20Seabirds%202020%20is,a%20national%20plan%20of%20action) is New Zealand's third iteration of a national plan of action. NPOA Seabirds 2020 focuses on education, partnering to find innovative solutions to bycatch mitigation, and ensuring that all fishers know how and are taking all practicable steps to avoiding seabird bycatch.

The orange roughy fisheries have a negligible impact on seabird populations (MPI, 2021), with only ten observed captures in the Chatham Rise UoAs and three observed captures in the ORH 7A UoA over the most recent 5-year period. In 2018–19 the six observed seabird captures in the ORH 3B UoAs were four Chatham Island albatross (of which two were released alive), one white-chinned petrel, and one common diving petrel (released alive). In 2018–19 there were no observed captures of seabirds in the ORH 7A UoA and no estimates of total captures were made (Figure 8).

**ORH 3B Chatham Rise**




**ORH 7A**

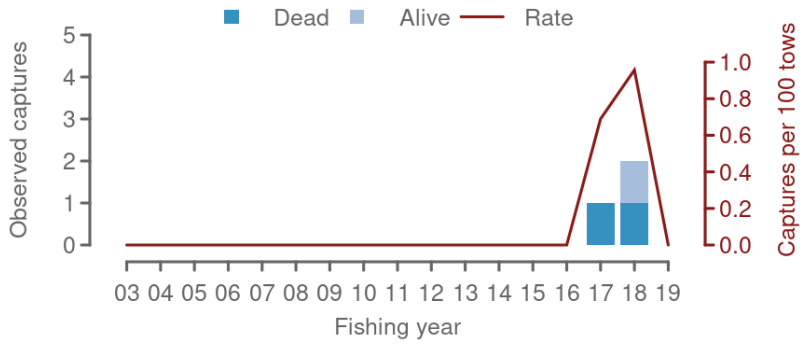



**Figure 8. Observed seabird captures in the ORH 3B UoAs on the Chatham Rise (top) and in the ORH 7A UoA (bottom), (MPI, 2021).**

**Marine Mammals**

Marine mammals of concern for the deepwater fisheries focus on New Zealand fur seals. Trawlers targeting orange roughy, oreo, and black cardinalfish occasionally catch New Zealand fur seal (which were classified as “Not Threatened” under the New Zealand Threat Classification System in 2010; FNZ, 2021). Between 2002–03 and 2007–08, there were 15 observed captures of New Zealand fur seal in deepwater (orange roughy, oreo, and black cardinalfish) trawl fisheries. There has been one observed capture in the period between 2008–09 and 2017–18 (Figure 9), during which time the average level of annual observer coverage was 26.7%.

Across the different target fisheries, the highest relative fur seal capture rates were in mackerel and southern blue whiting fisheries, with the lowest capture rate in trawl fisheries targeting deepwater species (Abraham *et al*., 2021). No orange roughy vessels have records of capture of whales, dolphins, or sea turtles during the period 2003-03 to 2018-19.

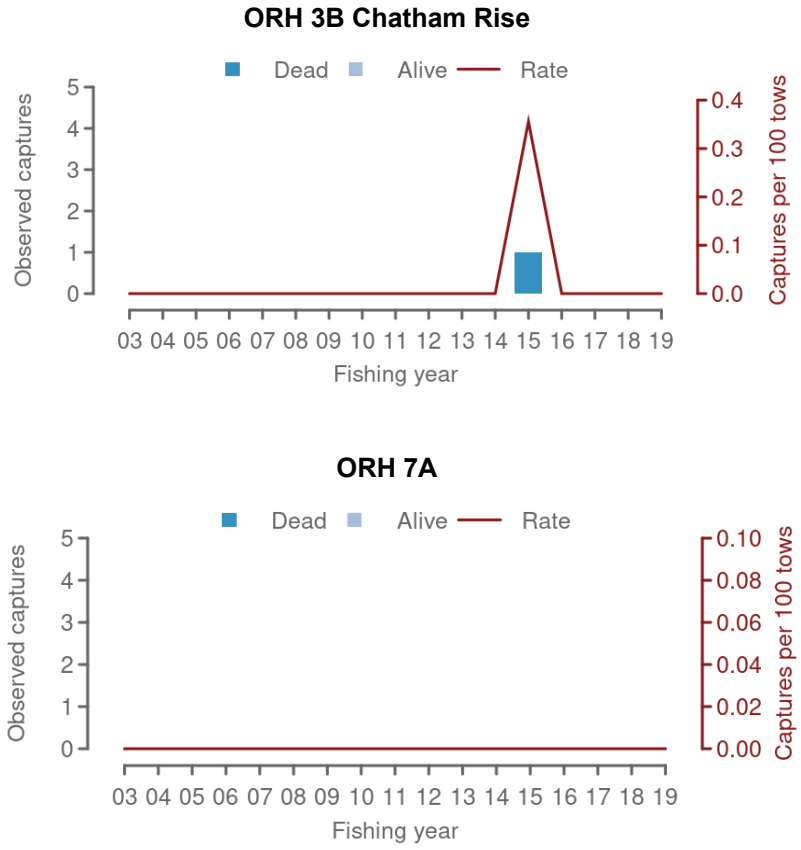


**Figure 9. Observed New Zealand fur seal captures by orange roughy trawl fisheries on the Chatham Rise (top) and in ORH 7A (bottom), 2002-03 to 2018-19 (MPI, 2021).**

*Protected Corals*

Table 9 provides the weight of observed coral captures in certified orange roughy UoAs for the 2019-2020 season (R. Tinkler, FNZ, pers. comm).

**Table 9. Observed coral captures from tows targeting orange roughy and oreo during the 2019-2020 fishing year (From R. Tinker, FNZ, pers. comm).**

| UoA | Observed Coral Capture (kg) | Total Tows | No. Observed Tows | Estimated coral catch per 100 tows (kg) | Total estimated coral catch (kg) |
|---|---|---|---|---|---|
| ORH 3B NWCR | 7 | 171 | 61 | 11.5 | 19.6 |
| ORH 3B ESCR | 64 | 1358 | 472 | 13.6 | 184.1 |
| ORH 7A | 29 | 555 | 193 | 15.0 | 83.4 |

The coral species most abundant in NWCR catches continue to be Scleractinian stony corals, particularly *Solenosmilia variabilis*. In ESCR, the main species encountered in the 2019-2020 fishing year were the stony coral *Solenosmilia platypus* and Gorgonian bamboo corals (R. Tinkler FNZ, 2020 pers. comm).

Analysis of coral capture data by UoA and by habitat type shows the following (Black and Easterbrook-Clark 2021):

- Overall, between 3% - 6% of all tows resulted in coral capture
- On UTF habitat, between 2% - 7% of tows resulted in coral capture
- On flat habitat, between 4% - 6% of tows resulted in coral capture
- The proportion of coral catch taken on UTF habitat was variable between 10% in NWCR, to 19% in ORH7A-WB and 68% in ESCR

This is summarized in Table 6

**Table 10. Average annual numbers of coral tows and coral capture (kg) reported by observers and vessels by habitat type and UoA over the period 2017-18 to 2019-20 (from Black and Easterbrook-Clark 2021)**

| Category | ORH7A - WB | ORH3B NWCR | ORH3B ESCR |
|---|---|---|---|
| Average annual coral catch (kg) | 15.36 | 33.58 | 511.13 |
| Annual average no. coral tows | 25 | 12 | 43 |
| % of tows that caught coral | 6% | 4% | 3% |
| Annual average coral catch on UTFs (kg) | 2.95 | 3.33 | 349.25 |
| % of coral catch on UTFs | 19% | 10% | 68% |
| Annual average no. coral tows on UTFs | 3 | 1 | 19 |
| % of tows that caught coral on UTFs | 7% | 2% | 3% |
| Annual average coral catch on flat (kg) | 12.41 | 30.24 | 161.88 |
| % of coral catch on flat | 81% | 90% | 32% |
| Average annual no. coral tows on flat | 22 | 11 | 24 |
| % of tows that caught coral on flat | 6% | 5% | 4% |

There is continuing research through the NZ Department of Conservation's (DOC) Conservation Services Program aimed at improved understanding of fishery impacts on protected corals, including the following new projects since the previous surveillance audit:

In 2020-21, a new project has been developed aimed at identifying gaps in mitigation technology/practice towards achieving reductions of protected coral species bycatch (DOC, 2020):

- Project MIT2020-03 – mitigation gaps analysis towards reducing protected species bycatch.

For 2021-22, two new protected coral-related projects are planned (DOC, 2021). These are:

- Project INT2021-02 – characterization of protected coral interactions towards an improved understanding of coral bycatch across multiple fisheries and fishing methods and to inform the development of a risk assessment for protected corals
- Project POP2021-02 – identification of protected coral hotspots based on analysis of towed camera transects and application of these data in species distribution models towards an improved understanding of the historical effects of fishing on coral distribution and relative abundance.

**Habitat and Ecosystem**

The orange roughy fishery operates over two main habitat types, Underwater Topographical Features (UTFs) and 'slope' within the three orange roughy UoA areas and across the New Zealand EEZ as a whole, as characterized and described in the Public Certification Report.

Regarding trawl footprint changes, Table 11 shows the results of analyses for the orange roughy and oreo target fisheries in the three UoC areas since 2005-06. The footprint remains small, and the assessment team is monitoring the small increases that have occurred in recent years for possible correlation with increases in the orange roughy TACCs as stocks continue to increase. The slight change in footprint does not change the conclusion from the full assessment PCR regarding potential impact of these UoAs on habitats.

The trawl footprint of orange roughy and oreo fisheries is monitored annually to assess the extent of their interactions with the benthic habitat (Black and Easterbrook-Clark 2021; Baird & Wood, 2018; Baird & Mules, 2019; Black & Tilney, 2017, Black *et al.*, 2013).

ORH/OEO trawl footprints indicate that the fisheries have traversed between 4.2% and 7.6% of UoA fishable grounds (i.e. 800-1,600 m depths) over the most recent three years, (Black and Esterbrook-Clark 2021;Table 11). New area trawled in 2017-18 to 2019-20 (3 years) amounted to between 2.4% and 3.5% of the fishable area, much of which has involved 'in-filling' of previously untouched areas within the traditional fishing grounds. In NWCR there has been a trend towards longer tows on slope habitat to the west of the 180 hills in recent years, while in ESCR the fishing effort has remained spread between UTF and slope habitat, as before. In ORH 7A, there has been a marked expansion of the fishery eastwards as of 2015-16, which is reflective of the fishery operating outside of the spawning period (the spawning area is in the extreme western part of ORH 7A).

**Table 11 ORH/OEO trawl footprint by UoA for the periods 2005-06 to 2019-20 and 2017-18 to 2019-20, new footprint area and area closures (km2 and %), (Black & Easterbrook-Clark, 2021).**

| UoA | UoA Habitat 800-1,600 m | Footprint 2005-06 to 2019-20 | | Footprint 2017-18 to 2019-20 | | New Footprint 2017-18 to 2019-20 | | UoA Closed Area | |
|---|---|---|---|---|---|---|---|---|---|
| NWCR | 17,398 | 3,267 | 18.8% | 1,326 | 7.6% | 617 | 3.5% | 52 | 0.3% |
| ESCR | 38,155 | 7,440 | 19.5% | 2,439 | 6.4% | 920 | 2.4% | 1,755 | 4.6% |
| ORH7A-WB | 78,871 | 6,110 | 7.7% | 3,332 | 4.2% | 2,329 | 3.0% | 12,304 | 15.6% |

There continues to be a small amount of new area swept each year. The assessment team continues to monitor this information and more detailed analyses are presented in the report for the ongoing reassessment.

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### 3.2.3 Management update

**Potential or actual changes to the management system**

No substantial changes in the management system have occurred that would adversely affect the certification of the orange roughy resources. The reorganized MPI to separate fisheries as separate Directorate continues.

The National Deepwater Fisheries Plan (National Deepwater Plan) was updated in 2019.

The National Deepwater Plan consists of three parts:

- Fisheries management framework and objectives:
    - Part 1A – strategic direction for deepwater fisheries

- Annual Operational Plan (AOP) – detailing the management actions for delivery during the financial year (FNZ, 2019)
- Annual Review Report (AAR) – reporting on progress towards meeting the five-year plan and on the annual performance of the deepwater fisheries against the AOP (FNZ, 2019a)
    - Part 1B- fishery-specific chapters and management objectives at the fishery level

An updated AOP (2021 https://deepwatergroup.org/newsresources/op-manual/) and AAR (2020 https://www.mpi.govt.nz/dmsdocument/39770-Annual-Review-Report-for-Deepwater-Fisheries-2018-19) were completed. The AOP laid out responsibilities of parties, orange roughy catch limit management, oreo catch limit management, and catch reporting requirements. The AAR laid out progress on management actions; fisheries research, compliance, observer coverage, and cost recovery; and general environmental reporting and adherence to non-regulatory management.

MPI published a Medium Term Research Plan (MTRP) for the period 2021-22 to 2025-26 (https://www.mpi.govt.nz/dmsdocument/21746-medium-term-research-plan-for-deepwater-fisheries). This MTRP outlines the scientific monitoring and research needs to inform management of New Zealand's deepwater fisheries.
The MTRP remains a living document and will be updated regularly to reflect changes in management priorities where these occur, and identification of new areas of research. Annual research plans will be consulted with stakeholders through the National Deepwater Fisheries Plan forums and reported in the Annual Operational Plans (AOP) and Annual Review Reports for deepwater fisheries.

**International management**

The orange roughy stock of ORH7A-WP extends from the New Zealand EEZ into the SPRFMO area. The in-zone portion of the stock is comprised of New Zealand Quota Management Area ORH 7A. New Zealand manages the in-zone portion of the orange roughy stock that straddles the New Zealand EEZ and the Westpac Bank area in the SPRFMO Convention Area. The fishery in this area began in the 1980s with the first catch limit in the area set in 1986 (https://www.sprfmo.int/assets/2020-SC8/SC8-Doc14-New-Zealand-Annual-Report.pdf). New Zealand has completed a number of surveys and stock assessments of the area, most recently presented to SPRFMO in 2019 (https://www.sprfmo.int/assets/2019-SC7/Meeting-Docs/SC7-DW06-A-2019-stock-assessment-of-ORH-7A-including-Westpac-Bank.pdf and https://www.sprfmo.int/assets/2019-SC7/Meeting-Docs/SC7-DW07-rev1-Stock-assessment-and-catch-limit-proposals-for-Westpac-Bank-orange-roughy.pdf), and up until 2019, has set and managed New Zealand's catch limits for the full biological stock. In 2019, SPRFMO established allocation of Westpac Bank to Australia and New Zealand (https://www.sprfmo.int/assets/0-2021-Annual-Meeting/Reports/Annex-7d-CMM-03a-2021-Deepwater-Species.pdf). SPRFMO has set total catch of orange roughy in Westpac Bank in each of the 2020, 2021, 2022, 2023 fishing years to 258 tonnes (based on the assumption that 12.5% of the Southwest Challenger Plateau biomass resides in the Westpac Bank area) but the Commission may review advice from the Scientific Committee based on a stock assessment undertaken by New Zealand and other relevant information. Of the 258 tonnes quota, SPROFMO allocated 13 tonnes to Australia and 245 to New Zealand. (https://www.sprfmo.int/assets/2020-Annual-Meeting/Reports/Annex-7d-CMM-03a-2020-Deepwater-Species.pdf). Although Australia has an allocation on Westpac Bank, its fishermen could not join the certified fishery without invitation to join the Deepwater Group. No request to join DWG has been requested or offered (DWG, pers. comm.).

**Observer coverage**

At the time of the Public Certification Report, observer coverage in the 2013-14 fishing year for the orange roughy fishery had dropped to the lowest levels in the historical coverage pattern due to a priority reallocation of observers onto Foreign Charter Vessels (as orange roughy fisheries are fished by domestic vessels only). Stakeholders expressed concern that the observer coverage at the time of certification no longer provided sufficient information to support management objectives. While observer-reported maturity data for orange roughy are used to assist in the research planning of some surveys, as fisheries-independent research surveys are undertaken to assess spawning stock biomass, little or no observer-derived information is used in the stock assessments for these fisheries. Low seabird and marine mammal incidental capture rates also do not support the need for extensive observer coverage. MPI consultations with the assessment team

demonstrated intent to increase coverage in future years. Observer coverage is fishery-specific, with objectives primarily to enable reliable estimation of protected species interactions and to provide a high level of confidence in fishers' at-sea compliance with regulatory and non-regulatory measures (FNZ, 2019). In general, FNZ considers 30% coverage as being sufficient, but this coverage level may increase or decrease depending upon the fisheries-specific objectives, up to100% coverage for fisheries where management may identify a need, such as in fisheries considered to pose high-risks to ETP species (e.g. squid and southern blue whiting trawl fisheries where operations overlap with foraging sea lions).

MPI's Scientific Observer Programme (SOP) collects data from fisheries, including ETP incidental capture information. Monitoring of interactions with ETP species is primarily the role of the Department of Conservation (DOC), in conjunction with MPI. For deepwater fisheries, the costs of observers are recovered through levies on quota owners, or directly from vessel owners for specific deployments. All observer deployments are managed by the SOP. The level of observer coverage for the different fisheries/sectors is tailored to suit the data and information requirements, including for stock assessment, compliance monitoring and ETP species captures. Performance delivery against targeted observer coverage in previous years is reviewed in their Annual Review Report (https://www.mpi.govt.nz/dmsdocument/39770-Annual-Review-Report-for-Deepwater-Fisheries-2018-19).

MPI and DOC consult to distribute the available observer days: MPI prioritizes fisheries coverage and DOC prioritizes protected species coverage (MPI, T. Bock, *pers. comm.*). As a result of the low level of protected species interactions in the orange roughy fisheries, the DOC share of observer coverage is $\leq$ 10% of the total. The high level of compliance in the orange roughy fisheries provides good information on ETP interactions and warrants lower than average observer coverage. However, FNZ has prescribed coverage $\geq$30%, and up to 40-50%, for the MSC UoAs to obtain sufficient biological data (e.g., age structures). Coverage levels for the 2015-16 to 2019-2020 fishing year averaging 26% in NWCR, 29% in ESCR and 37% in ORH 7A (Table 12). As a standard permit condition all demersal fishing on the High Seas, including the Westpac Bank area adjacent to New Zealand's EEZ, is required to have 100% observer coverage. Orange roughy on Westpac Bank and in ORH 7A are assessed and managed as a straddling stock.

**Table 12. Observer coverage for orange roughy fishing vessels in the Units of Assessments, 2015-2016 to 2019-2020 (FNZ data).**

| | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 5-year Average |
|---|---|---|---|---|---|---|
| **NWCR** | | | | | | |
| Tows | 392 | 456 | 385 | 220 | 171 | 325 |
| Obs tows | 91 | 100 | 106 | 61 | 61 | 84 |
| % Observed | 23% | 22% | 28% | 28% | 36% | 26% |
| **ESCR** | | | | | | |
| Tows | 1229 | 1179 | 1151 | 1247 | 1358 | 1233 |
| Obs tows | 690 | 324 | 30 | 350 | 411 | 361 |
| % Observed | 56% | 27% | 3% | 28% | 30% | 29% |
| **ORH7A-WB** | | | | | | |
| Tows | 560 | 533 | 547 | 478 | 555 | 535 |
| Obs tows | 242 | 153 | 304 | 108 | 193 | 200 |
| % Observed | 43% | 29% | 56% | 23% | 35% | 37% |

The observer program achieved 85% and 88% of planned sea day observer coverage (Table 13) for the Chatham Rise and west coast regions for all deepwater fisheries, respectively, from 2016-17 to 2020-21 fishing years (https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/operating-as-a-commercial-

fisher/fisheries-observer-services/#DW-fisheries). The program exceeded the planned number of days once for Chatham Rise and twice for the West coast.

**Table 13. Number of observer sea days planned for the Deepwater Fishery for the Chatham Rise and West Coast and the total delivered from 2016-17 to 21 July 2021. (https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/operating-as-a-commercial-fisher/fisheries-observer-services/#DW-fisheries)**

| Year | Chatham Rise sea days | | West Coast sea days | |
|---|---|---|---|---|
| | Planned | Achieved | Planned | Achieved |
| 2020-21 | 250 | 233 | 60 | 97 |
| 2019-20 | 300 | 266 | 100 | 45 |
| 2018-19 | 220 | 261 | 60 | 21 |
| 2017-18 | 220 | 161 | 40 | 65 |
| 2016-17 | 270 | 146 | 70 | 62 |
| Average | 252 | 213 | 66 | 58 |

## Enforcement

The MRAG assessment team discussed general enforcement issues with Geoff Backhouse (FNZ Enforcement), including performance against the MSC performance indicator for enforcement (PI 3.2.3) and specific areas of compliance risk to monitor in 2020. MPI maintains a comprehensive compliance programme, which includes both encouraging compliance through support and creating effective deterrents.

Mr Backhouse reported that:

- FNZ Enforcement continues to use risk-based enforcement, and that the orange roughy fishery is low risk. FNZ Enforcement coordinates with the Navy and Air Force, and that COVID-19 protocols required cancelling some planned boardings and patrols. Enforcement uses observer reports, such as comparing catch rates from observer and daily electronic vessel reports.

- There is no evidence of shark finning in the fishery, based on in-port inspections and boardings. The orange roughy fishery does not retain much shark.

- The fishery has no serious violations. Orange roughy is not considered an enforcement priority, based on consultations among the science division, the management division, and enforcement.

During the site visit, stakeholders pointed out several reports of deepwater vessels cited for illegal fishing (DSCC, 2021). DSCC reports that owners and or operators of deepwater trawlers *Amaltal Apollo*, *Amaltal Mariner*, *Ocean Dawn*, and *San Waitake* are undergoing prosecution or have been convicted of fishing in closed areas. NZ enforcement detected these violations, demonstrating that the enforcement system works. This issue is under review in the certification re-assessment currently underway for the certified orange roughy fisheries.

Commercial fishermen face prosecution and risk severe penalties, which include automatic forfeiture of vessel and quota upon conviction of breaches of the fisheries regulations (unless the court rules otherwise). Financial penalties are also imposed in the form of deemed values to discourage fishermen from over-catching their ACE holdings.

The extensive regulations governing these fisheries are complemented by additional industry-agreed non-regulatory measures, known as the New Zealand Deepwater Fisheries Operational Procedures. The Minister relies on the effectiveness of both regulatory and non-regulatory measures to ensure the sustainable management of these fisheries.

The MRAG assessment team concludes that enforcement continues at a high level for the orange roughy fishery.

**Changes or additions/deletions to regulations**

There have been no changes in the regulations affecting the fishery since the previous surveillance audit, other than those reported in the enforcement section, above.

**Personnel changes in science, management or industry to evaluate impact on the management of the fishery**

Dan Bolger remains Deputy Director General of MPI and head of FNZ, and Stuart Anderson remains head of Fisheries Management. Tiffany Bock remains head of the Deepwater Management team, within Fisheries Management. The Deepwater Management team added some new members. Fisheries Management added teams for data management, verification and observation, governance and strategy , and digital monitoring.

The CEO of the Deepwater Group, George Clement, remains in place. Aaron Irving has rejoined the Deepwater Group as Deputy CEO.

None of these changes in personnel or organization pose any threat to the integrity of the certification.

**Potential changes to the scientific base of information, including stock assessments**

Digital data collection has been in place for the past three years, enabling more precision in tow location to inform trawl footprint. The 2021 biomass surveys for the Chatham Rise will be used to update stock assessments to be completed by May 2022.

**Traceability Update**

No changes have occurred that affect the traceability or segregation of product from the fishery. The fishery monitoring system remains robust and well suited to confirming traceability.

**P3 References:**

DSCC. 2021. Save deep sea corals. Ban bottom trawling on seamounts. Deep Sea Conservation Coalition. http://www.savethehighseas.org/resources/publications/report-save-deep-sea-corals-ban-bottom-trawling-on-seamounts/

FNZ. 2020.AAR https://www.mpi.govt.nz/dmsdocument/39770-Annual-Review-Report-for-Deepwater-Fisheries-2018-19

FNZ. 2021. AOP https://deepwatergroup.org/newsresources/op-manual/

MPI. 2021. Planned and achieved observer days. https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/operating-as-a-commercial-fisher/fisheries-observer-services/#DW-fisheries

MPI. 2021. Medium term Research Plan. https://www.mpi.govt.nz/dmsdocument/21746-medium-term-research-plan-for-deepwater-fisheries

SPRFMO. 2019.ORH7A-WP stock assessment. https://www.sprfmo.int/assets/2019-SC7/Meeting-Docs/SC7-DW06-A-2019-stock-assessment-of-ORH-7A-including-Westpac-Bank.pdf

SPRFMO. 2019. ORH catch limit proposals for Westpac Bank. https://www.sprfmo.int/assets/2019-SC7/Meeting-Docs/SC7-DW07-rev1-Stock-assessment-and-catch-limit-proposals-for-Westpac-Bank-orange-roughy.pdf

SPRFMO. 2020. New Zealand Annual Report. https://www.sprfmo.int/assets/2020-SC8/SC8-Doc14-New-Zealand-Annual-Report.pdf

SPRFMO. 2021. Orange roughy quota setting for Westpac Bank. https://www.sprfmo.int/assets/0-2021-Annual-Meeting/Reports/Annex-7d-CMM-03a-2021-Deepwater-Species.pdf

## 3.3 Version details

**Table 14 Fisheries program documents versions**

| Document | Version number |
|---|---|
| MSC Fisheries Certification Process | **Version 2.2** |
| MSC Fisheries Standard | **Version 2.01** |
| MSC General Certification Requirements | **Version 2.4.1** |
| MSC Surveillance Reporting Template | **Version 2.1** |

# 4 Results

## 4.1 Surveillance results overview

### 4.1.1 Summary of conditions

There were no open conditions remaining at the start of the 4th surveillance audit. Conditions 1 and 4 were rescored and closed out at the second surveillance (MRAG Americas 2019) and conditions 2 and 3 were closed at the third surveillance audit (MRAG Americas 2020).

Table 15. Summary of conditions.

| Condition number | Condition | Performance Indicator (PI) | Status | PI original score | PI revised score |
|---|---|---|---|---|---|
| Add rows as needed | Add condition summary | | Choose from: New / Closed / Ahead of target / On target / Behind target. If closed, indicate surveillance number when closed. | PI score from most recent assessment | PI score after this surveillance, or 'Not revised'. |
| 1 | | 1.1.1 | Closed (2nd audit) | 70 | 90 |
| 2 | | 2.3.1 | Closed (3rd audit) | 75 | **85** |
| 3 | | 2.3.3 | Closed (3rd audit) | 75 | 80 |
| 4 | | 3.2.5 | Closed (2nd audit) | 70 | 90 |

### 4.1.2 Total Allowable Catch (TAC) and catch data

**Table 16 – Total Allowable Commercial Catch (TACC) and catch data – ORH 7A-WB**

| | | | | |
|---|---|---|---|---|
| TACC | Year | **2020-21** | Amount | **2,058 t** |
| UoA share of TACC | Year | **2020-21** | Amount | **2,058 t** |
| Total green weight catch by UoC | Year (most recent) | **2019-20** | Amount | **1,897 t** |
| Total green weight catch by UoC | Year (second most recent) | **2018-19** | Amount | **1,589 t** |

**Table 17 - Total Allowable Commercial Catch (TACC) and catch data - ORH 3B ESCR**

| | | | | |
|---|---|---|---|---|
| TACC* | Year | **2020-21** | Amount | **5,970 t** |
| UoA share of TACC | Year | **2020-21** | Amount | **5,970 t** |
| Total green weight catch by UoC | Year (most recent) | **2019-20** | Amount | **4,769 t** |
| Total green weight catch by UoC | Year (second most recent) | **2018-19** | Amount | **4,143 t** |

* Note that this is a sub-area catch limit, not a TACC

**Table 18 - Total Allowable Commercial Catch (TACC) and catch data - ORH 3B NWCR**

| | | | | |
|---|---|---|---|---|
| TACC* | Year | **2020-21** | Amount | **1,150 t** |
| UoA share of TACC | Year | **2020-21** | Amount | **1,150 t** |
| Total green weight catch by UoC | Year (most recent) | **2019-20** | Amount | **223 t** |
| Total green weight catch by UoC | Year (second most recent) | **2018-19** | Amount | **294 t** |

* Note that this is a sub-area catch limit, not a TACC

### 4.1.3 Recommendations

The assessment team strongly recommends that FNZ include in future Plenary or Stock Assessment Reports the calculations presented in Cordue (2018) documenting how the vulnerable biomass is computed, including any weighting scheme, the exploitation rate (U) used, and hence the product of the two. The HCR has a sliding scale of U depending on estimated biomass and the values of each are not clear in the standard documents FNZ produces.

## 4.2 Re-scoring Performance Indicators

No PIs were scored as part of the 4th surveillance audit. Previous rescoring can be found in MRAG Americas (2019 and 2020).

## 4.3 Conditions

### 4.3.1 Closed Conditions

All open conditions were closed prior to the 4th surveillance audit. Please see MRAG Americas (2019 and 2020) for previous conditions progress updates.

### 4.3.2 Progress against conditions

There were no open conditions for the 4th surveillance audit.

### 4.3.3 New conditions – delete if not applicable

There were no new conditions raised during the 4th surveillance audit.

## 4.4 Client Action Plan

As there were no open conditions, no changes to the client action plan would have been applicable.

# 5 Appendices

## 5.1 Evaluation processes and techniques

### 5.1.1 Site visits

The site visit for this audit was combined with the site visit for this fishery's reassessment. As such, information supplied by the clients and management agencies, much of which was made available at the DWG website: https://deepwatergroup.org/certification/orange-roughy-msc-reassessment/, was reviewed by the assessment team ahead of the remote meeting, in part for the production of the reassessment Announcement Comment Draft Report, and discussions with the clients and management agencies centered on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during or shortly after the meeting. As a result of the combination with the reassessment, the assessment team agreed with the client and all stakeholders to accept comment and new information submitted up to 30 days following the site visit for consideration by the team.

Thirty days prior to the surveillance audit, all stakeholders from the previous full assessment and parties to other related assessments were informed of the meeting and the opportunity to provide information to the auditors in advance of, or during, the meeting.

The MRAG Americas surveillance carried out the following as part of the surveillance audit:

- Audit public claims made by the client regarding its certified status (including but not restricted to those made on printed material such as brochures).
- Review any potential or actual changes in management systems.
- Review any changes or additions/deletions to regulations.
- Review any personnel changes in science, management or industry to evaluate impact on the management of the fishery.
- Review any potential changes to the scientific base of information, including stock assessments.
- Evaluate progress against any conditions placed on the certificate, as well as for continued compliance with the *MSC Fisheries Standard (v1.3)* as specified in the Public Certification Report, noting that the reassessment is against version 2.01, the surveillance stays with v1.3.

The surveillance team has the responsibility, if it identifies an issue requiring further investigation, to:

- Report and record the existence of the issue, and/or
- Immediately conduct a limited assessment to determine if a full re-assessment of the fishery is warranted to continue the certification status, and/or
- Raise further conditions.

The surveillance audit was conducted remotely via video conference on November 1-4 (US participants)/November 2-5 (NZ participants), 2021. The MSC's *Derogation 3: Covid-19 Fishery and Chain of Custody Remote Auditing* enables CABS to conduct the surveillance audit remotely when national or travel restrictions that impact the assessment team or certificate holders are in place. At the time of the site visit strict travel restrictions were in place: https://www.immigration.govt.nz/about-us/covid-19/border-closures-and-exceptions.

The following participants were in attendance, listed alphabetically by first name:

| Name | Affiliation |
|---|---|
| Aaron Irving | Deepwater Group |
| Amanda Stern-Pirlot | MRAG Americas assessment team |
| Andre Punt | MRAG Americas assessment team |
| Barry Weeber | ECO |
| Bob Trumble | MRAG Americas assessment team |
| Brit Finucci | NIWA |
| Carolyn Aguilar | WWF New Zealand |
| Cath Wallace | ECO |
| Charles Heaphy | Sealord Group Ltd |
| Duncan Currie | DSCC |

| | |
|---|---|
| Fabrice Stephenson | NIWA |
| Geoff Backhouse | Ministry of Primary Industries (MPI) |
| Geoff Tingley | Gingerfish Ltd (client consultant) |
| George Clement | Deepwater Group (client) |
| Karli Thomas | Deep Sea Conservation Coalition (DSCC) |
| Lyndsey Holland | FNZ |
| Patrick Cordue | ISL |
| Richard Wells | DWG |
| Rob Tilney | Deepwater Group |
| Robert Tinkler | Fisheries New Zealand (FNZ) |
| Tiffany Bock | FNZ |

Private meetings with non-client meeting participants (including with MPI/Fisheries New Zealand) were offered and accepted by members of the DWCC, ECO and WWF New Zealand.

The following is the agenda that was followed (times indicated are NZ time):

| Date | NZ Time | Agenda | Discussion Lead |
|---|---|---|---|
| **Tuesday 2** (Times are indicative) | **0900-0930** | **Site visit opening meeting** | MRAG Americas |
| | | | |
| | **0930-1100** | **Fishery Update & Discussion** | |
| | | UoA catches, fishery performance, seasonality, strategies, traceability | George Clement (DWG) Charles Heaphy (Industry), |
| | | | |
| | **1100-1230** | **Update on Management (P3)** | |
| | 1100-1200 | Fisheries management framework, fishery plans, progress against management objectives, developments/changes within FNZ | Tiffany Bock, Rob Tinkler (FNZ) |
| | 1200-1230 | MSE, HCR & TACC setting | Geoff Tingley (DWG), Tiffany Bock (FNZ) |
| | | | |
| | **1230-1245** | **Break** | |
| | | | |
| | **1245-1400** | **Update on Stock Status (P1)** | |
| | | Stock assessments and stock status summary | Patrick Cordue (ISL) |
| | | | |
| **Wednesday 3** (Times are indicative) (Times are indicative) | **0800-1200** | **Updates on Environmental Interactions (P2)** | |
| | 0800-0815 | Discussion on compliance & enforcement | Geoff Backhouse (MPI) |

| | | | |
|---|---|---|---|
| | 0815-1200 | Non-target catch, ETP species, ETP corals, Habitats, Ecosystem | Richard Wells, Aaron Irving (DWG)<br>Rob Tinkler (FNZ)<br>Brit Finucci (NIWA - bycatch) Fabrice Stephenson (NIWA - habitat models)<br>Lyndsey Holland (DoC - corals research & monitoring) |
| **Friday 5** | **0800-1100** | **Stakeholder meetings** | Assessment team and eNGO stakeholders |
| | **1100-1200** | **Site visit closing meeting** | MRAG Americas |

### 5.1.2 Stakeholder participation

Thirty days prior to the surveillance audit, all stakeholders from the full assessment were informed of the meeting and the opportunity to provide information to the auditors in advance of, or during, the meeting. No written comments were received prior to the site visit, but written comments to the reassessment were received according to the agreed timeline following the site visit. As stakeholder comment and involvement pertained primarily to the reassessment content, it will be reported on in detail only in the reassessment reports and not in this surveillance report.

## 5.2 Stakeholder input

No written input was provided ahead of the surveillance audit process. There were meetings held with eNGO groups who requested them, however the substance of the meetings was directed at the reassessment rather than this surveillance audit, thus the detail will be provided in the reassessment reports.

## 5.3 Revised surveillance program – delete if not applicable

Not applicable as this was the 4th and final surveillance audit for this certification cycle.

## 5.4 Harmonised fishery assessments – delete if not applicable

Although there are overlapping fisheries, no harmonization was needed or carried out because the present assessment is on version 1.3 of the default assessment tree, while the overlapping fisheries are on version 2.0, and a detailed harmonization and cumulative impacts assessment are being done as part of the ongoing reassessment process. There are currently no discordant outcomes between this fishery and others with which the UoAs overlap.