8950 Martin Luther King Jr. Street N. #202
St. Petersburg, Florida 33702-2211
Tel: (727) 563-9070
Fax: (727) 563-0207
Email: MRAG.Americas@mragamericas.com

President: Andrew A. Rosenberg, Ph.D.

New Zealand Orange Roughy

3rd Surveillance Report

9 January 2026

Conformity Assessment Body (CAB)	MRAG Americas, Inc.
Assessment team	Erin Wilson, Andre Punt, Michealene Corlett
Fishery client	Seafood New Zealand | Deepwater Council
Assessment type	Third Surveillance
Author name	Erin Wilson, Andre Punt, Michealene Corlett
Date	09 January 2026

Document Control Record

Document Draft	Submitted By	Date	Reviewed By	Date
Surveillance	EW, AP, MC	1/9/26	EW	1/9/26

1. Contents

Contents

New Zealand Orange Roughy 1
3rd Surveillance Report 1
1. Contents 3
2. Glossary 6
3. Executive summary 6
4. Audit details 7
4.1. Surveillance information 7
4.2. Version details 10
4.3. Update on the fishery 10
4.4. Changes which impact traceability systems 33
5. Surveillance Audit Results 33
5.1. Summary overview 33
5.2. Re-scoring Performance Indicators 34
5.3. Conditions 34
5.4. Client Action Plan 36
6. Appendices 37
6.1. Evaluation processes and techniques 37
6.2. Stakeholder input 41
7. References (Bibliography) 68

List of Figures

Figure 1. Assessment model runs Acoustic 38 and Acoustic 120, MCMC estimates of spawning stock biomass (solid line, median; shaded region, 95% credible intervals) and implied fits to the acoustic series (points; vertical lines, 95% CI). (Source: FNZ, 2025b). 12
Figure 2. Assessment model runs Acoustic 38 and Acoustic 120, (left) prior (broken line) and the MCMC posterior (solid line) for survey catchability, with text giving the median and 95% credible intervals; (right) prior (broken line) and the MCMC posterior (solid line) for natural mortality rate (M) with text giving the median and 95% credible intervals. (Source: FNZ, 2025b). 12
Figure 3. MCMC estimated spawning-stock biomass trajectory for assessment model runs using the 38 kHz AOS or 120 kHz AOS acoustic biomass series (solid line, median; shaded region, 95% credible intervals) Dotted lines indicate the hard limit (0.1 B_0) and soft limit (0.2 B_0), and dashed lines the management target range (0.3–0.5 B_0). (Source: FNZ, 2025b). 13
Figure 4. MCMC estimated exploitation rate trajectory for the two assessment model runs (boxplot where the solid line, median; outer box, interquartile range; whiskers 95% SI) Green shaded area indicates the exploitation rate corresponding to the target zone (U_{30} to U_{50}). (Source: FNZ, 2025b). 13
Figure 5. Historical trajectory of spawning biomass (% B_0), median exploitation rate (%), and exploitation rate for the two model runs. The biomass target range of 0.3–0.5 B_0 and the corresponding exploitation rate range are marked in green. The soft limit (0.2 B_0) and the hard limit (0.1 B_0) are marked in red. (Source: FNZ, 2025b). 14
Figure 6 Observer coverage and fishing effort in the orange roughy fishery in NWCR. The most recent fishing year for which data are presented is 2024/2025. 15
Figure 7 Observer coverage and fishing effort in orange roughy fisheries in ORH7A The most recent fishing year for which data are presented is 2024-25. 16
Figure 8 Annual estimates of discards in the target orange roughy trawl fishery, by species category, for 2002-2003 to 2019-2020 and equivalent estimates up to 2014-15 from Anderson et. al. (2017; grey dots). Error bars indicate 95%

confidence intervals. The red lines show the fit of ta locally-weighted polynomial regression to annual discards. Source: Anderson and Finucci (2022), Figure 25. 17
Figure 9 Bycatch of rattail and unspecified sharks and dogfish species in the ORH7A fishery from 2020-21 to 2024-25. 19
Figure 10 Estimated cumulative relative biomass (t) of 22 species of rattail reported in the Trawl Survey. Source: Portal for the WCSI bottom trawl survey series; niwa.co.nz/search 20
Figure 11 . Estimated relative biomass (t) of Bollons' rattail reported in the Trawl Survey Information. Source WCSI bottom trawl survey series. 20
Figure 12 Bycatch of rattail and slickhead species (in tonnes) in the NWCR fishery from 2020-21 to 2024-25. 22
Figure 13 Relative biomass estimates (thousands of tonnes) of bigscaled brown slickheads sampled by bottom trawl surveys of the Chatham Rise from 1992 to 2024. Grey lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1300 m) strata. Black solid lines show fish from core strata plus the northern and southern deep (800–1300 m) strata, and black dotted lines show fish from core strata plus the northern and southern 25 and 28 deep strata (800–1300 m). Error bars show ± 2 standard errors. 23
Figure 14 Relative biomass estimates (thousands of tonnes) of four-rayed rattails sampled by trawl Grey lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1300 m) strata. Black solid lines show fish from core strata plus the northern and southern deep (800–1300 m) strata, and black dotted lines show fish from core strata plus the northern and southern 25 and 28 deep strata (800–1300 m). Error bars show ± 2 standard errors 23
Figure 15 Observed New Zealand seabird captures in the 7A-WB UoA (Fisheries New Zealand, pers. Comm) 24
Figure 16 Observed seabird captures in NWCR (FNZ, pers. comm) 24
Figure 17 . Distribution of the 1990 – 2021 (left) and 2021 trawl footprints (right) for orange roughy displayed by 25km2 contacted cell, relative to the probability of capture for that species (MacGibbon and Mules, 2023) 27
Figure 18 The number of bottom-contacting tows by year for the period 1990 - 2021 for deepwater tier 1 species. 27
Figure 19 The number of contacted 25 km2 cells and footprint (km2) for combined targets ORH/OEO bottom-contacting trawls in ORH 7A from 2011 – 2021. 28
Figure 20 The number of contacted 25km2 cells and footprint (km2) for combined targets ORH/OEO bottom-contacting trawls in NWCR from 2011 – 2021. 28
Figure 21 ORH 7A UoA trawl footprint for ORH/OEO targeted tows and for HAK/HOK/LIN targeted tows with starting depths ≥ 800 m, 2017-18 to 2019-20. 29
Figure 22 NWCR UoA trawl footprint for ORH/OEO targeted tows and for HAK/HOK/LIN targeted tows with starting depths ≥ 800 m, 2017-18 to 2019-20. 29
Figure 23 A selection of trawl paths created using GPR data (orange lines) and the corresponding tows created using the 'traditional ERS straight-line' method (green lines). 30
Figure 24 Commercial catch vs TACC trend for all of ORH 3B. Source: Fisheries New Zealand 31
Figure 25 Commercial Catch vs. TACC ORH 7A. Source: Fisheries New Zealand 31
Figure 26 NWCR trawl tow with 6,000kg of dead coral and mud catch (not paused) ..... **Error! Bookmark not defined.**
Figure 27 NWCR trawl tows with trigger-level coral catch at the 180° hills complex. A single tow on a UTF caught 450 kg of live coral (paused towline) and a single flats tow caught 600 kg of dead coral rubble (not paused). ..... **Error! Bookmark not defined.**
Figure 28 Paused towlines (circled) in ORH 3B NWCR and ESCR during 2022-23 and 2024 - 2025 . **Error! Bookmark not defined.**

List of Tables

Table 1: Surveillance information 7
Table 2: Fisheries program documents versions 10
Table 3. Acoustic survey estimates of spawning biomass used in the assessment. Surveys covered both the Graveyard and Morgue hills. Only biomass indices estimated using the AOS system were included. The CVs do not include any process error. (source: FNZ, 2025b). 11
Table 4. MCMC estimates of virgin biomass (B_0), stock status (B_{2025} as $\%B_0$), and the probability of being above the lower (0.3 B_0) limit of the target range and below the soft (0.2 B_0) and hard limits (0.1B_0), for two model runs. (Source: FNZ, 2025b). 14
Table 5. Bayesian median and 95% credible intervals (in parentheses) of projected B_{2030}, B_{2030} as a percentage of B_0), B_{2030}/ B_{2025} (%), and the probability (%) of SSB being below the lower bound of the target zone (0.3 B_0) and below the soft limit (0.2 B_0) in 2030. Projections made for current catch (212 t) and TACC (1 150 t), to which a 5% assumed catch over-run is added. (Source: FNZ, 2025b). 14
Table 6 Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the NWCR trawl fishery from 2020-20221 to 2024-2025 (Fisheries New Zealand, Pers comm) 15

Table 7 Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the ORH7A trawl fishery from 2020-21 to 2024-25 (FNZ, pers. comm) 16
Table 8b ORH7A average estimated catch composition of targeted ORH tows, in kilograms and percentage, from 2020-21 to 2024-25 based on observer data. Species with <0.01% estimated catch have not been included. Source: FNZ 18
Table 9 NWCR average estimated catch composition of targeted orange roughy tow, in kilograms and percentage, from 2020-2021 to 2024-2025 based on observer data. Species with <0.01% estimated catch have not been included. Source: FNZ *Note gaps in data are due to formatting. 21
Table 10 ORH7A observed and estimated coral catch (kg) from fishing years 2020-21 to 2024-25 (FNZ, Pers. Comm) 25
Table 11 NWCR observed and estimated coral catch (kg) from fishing years 2020-21 to 2024-25 (Fisheries New Zealand, Pers. Comm) 25
Table 12 Vessel-reported and observer-reported coral catch (kg) in NWCR and 7A-WB from fishing years 2020-21 to 2024-25 (FNZ, Pers. Comm). 26
Table 13: Allowable Catch (TAC) and catch data ORH3B NWCR 32
Table 14 Allowable Catch (TAC) and catch data ORH 7A 32
Table 15: Changes affecting traceability and segregation 33
Table 16: Summary of conditions 33
Table 17: Condition 1 – OPEN 34
Table 18. Details of trigger-level towlines and paused towlines (red) in the NWCR UoA and in ORH 3B ESCR to date. Source: DWG ..... **Error! Bookmark not defined.**
Table 19 Details of trigger-level towlines and paused towline (red) in NWCR UoA and in ORH 3B ESCR to 2024-2025 ..... **Error! Bookmark not defined.**
Table 20 Stakeholders contacted for this surveillance audit 37

2. Glossary

AEBAR	Aquatic environment and biodiversity annual review
AOS	Acquisition of Signal
CAB	Conformity Assessment Body
CPUE	Catch Per Unit Effort
DOC	Department of Conservation
DWG	Deepwater Group
EEZ	Exclusive Economic Zone
ERS	Electronic reporting system
ESCR	East & South Chatham Rise
ETP	Endangered, Threatened, and Protected
FAO	Food and Agriculture Organization
FCP	Fisheries Certification Process
FNZ	Fisheries New Zealand
GIS	Geographic Information System
GPR	Geospatial Position Reporting
IUCN	International Union for Conservation of Nature
M	Natural mortality
MCMC	Markov chain Monte Carlo
MPI	Ministry for Primary industries
MSC	Marine Stewardship Council
NWCR	Northwest Chatham Rise
NZ	New Zealand
ORH	Orange Roughy
QMS	Quota Managed Species
SOP	Scientific Observer Program
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
VMS	Vessel Monitoring System
WCSI	West Coast South Island

3. Executive summary

This report contains the results of the third annual surveillance audit for the MSC certified New Zealand orange roughy fishery. Two of the original three Units of Certification remain in the MSC program and are reported on in the present report. One unit, Orange Roughy 3B ESCR, was “self-suspended” by Deepwater Group, the fishery client, on 20 December 2023. There is therefore no reporting on this UoC within the current surveillance report.

A remote surveillance audit was carried out on 10 November 2025 – 14 November 2025 with the assessment team participating remotely from Seattle, WA USA. At least thirty days beforehand, the assessment site visit was announced to provide stakeholders with an opportunity to express interest or provide written comment. During the site visit, information supplied by industry, managers and scientists was reviewed, and interviews with relevant stakeholders were held.

As mentioned previously, the present report contains the findings of the 3rd surveillance audit for the ORH 3B NWCR and ORH 7A including Westpac Bank Units of Certification. Progress on the single open condition has been made, and no rescoring has occurred nor new conditions raised. MRAG Americas has determined that these two UoCs remain in conformity with the MSC Fishery Standard and should remain certified.

4. Audit details

4.1. Surveillance information

Table 1: Surveillance information

1	Fishery name
New Zealand orange roughy	
2	**Unit(s) of Assessment (UoA)**

UoA 1	Description
Species	Orange Roughy (*Hoplostethus atlanticus*)
Stock	ORH7A including Westpac Bank
Fishing gear type(s) and, if relevant, vessel type(s)	Demersal trawl
Client group	Deepwater Group Limited
Other eligible fishers	The three units of assessment represent three of the nine management units of orange roughy in New Zealand. Eligible fishers are DWG shareholders with authorization from the New Zealand government to fish for orange roughy.
Geographical area	FAO Area 81 (Pacific, Southwest), ORH7A, including Westpac Bank which is outside the NZ EEZ.
UoA 2	Description—This UOC is currently suspended and in the MSC's Improver Program.
Species	Orange Roughy (*Hoplostethus atlanticus*)
Stock	ORH3B East & South Chatham Rise (currently suspended; not part of this surveillance audit)
Fishing gear type(s) and, if relevant, vessel type(s)	Demersal trawl
Client group	Deepwater Group Limited
Other eligible fishers	The three units of assessment represent three of the nine management units of orange roughy in New Zealand. Eligible fishers are DWG shareholders with authorization from the New Zealand government to fish for orange roughy.
Geographical area	FAO Area 81 (Pacific, Southwest), ORH3B East and South Chatham Rise (ESCR), east of 179° 30' W
UoA 3	Description
Species	Orange Roughy (*Hoplostethus atlanticus*)
Stock	ORH3B Northwest Chatham Rise

Fishing gear type(s) and, if relevant, vessel type(s)	Demersal trawl
Client group	Deepwater Group Limited
Other eligible fishers	The three units of assessment represent three of the nine management units of orange roughy in New Zealand. Eligible fishers are DWG shareholders with authorization from the New Zealand government to fish for orange roughy.
Geographical area	FAO Area 81 (Pacific, Southwest), ORH3B Northwest Chatham Rise (NWCR)

3	Date certified	Date of expiry
	02 August 2022	01 August 2027

4 Audit type and number

- 3rd surveillance audit

5 Surveillance level

- Level 4, off-site
- Surveillance activities have changes, please see Appendix 1.

6 Surveillance team leader

Ms. Erin Wilson joined MRAG Americas, Inc. in February 2015, where she currently serves as Director for the Fisheries Certification Division. She serves as the team leader, and/or team member, on several fishery assessments for both the Marine Stewardship Council (MSC) and Responsible Fisheries Management (RFM) Standards for Certification. She also works on the implementation and analysis of fishery improvement projects (FIPs) and provides oversight on social compliance audits and risk assessments. She has over 15 years' experience in marine science and has collaborated on a multitude of projects that focus on conservation in both a biological and social science aspect. Prior to joining MRAG Americas, she worked at the Oregon Department of Fish and Wildlife (ODFW) as a Natural Resource Specialist and Biological Technician for the Oregon Marine Reserves. She has conducted qualitative interviews with commercial fishermen and fishing communities along the west coast regarding catch share programs, limited entry, and proposed designations of marine reserves. She has completed ISO 19011 Lead Auditor for Management Systems, SA8000, the SRA training for Fishery Progress, FISH Standard for Crew and all the MSC and RFM required trainings for team leader and assessment team member. She received a M.Sc. in Marine Resource Management from Oregon State University, a B.S. in Zoology and a Spanish minor from Colorado State University, and attended Auburn University for Marine Science.

MRAG Americas confirms that Ms. Wilson meets the competency criteria in Annex PC for team leader as follows:

- She has an appropriate university degree and more than three years' experience in management and research in fisheries.
- She has passed the MSC team leader training.
- She has passed the MSC Traceability training module.
- She meets ISO 19011 training requirements.
- She has undertaken two fishery assessments as a team member in the last five years; and
- She has experience in applying different types of interviewing and facilitation techniques and is able to effectively communicate with clients and other stakeholders.

In addition, she has the appropriate skills and experience required to serve as a Principle 2 assessor as described in FCP Annex PC table PC3 as follows:

- She has 3 or more years' experience in research into policy analysis for, or management of the impact of fisheries on aquatic ecosystems, including at least 2 of the following topics: bycatch, ETP/OOS, habitats, ecosystem interactions.

MRAG Americas confirms that Erin Wilson has no conflicts of interest in relation to the fishery under assessment.

7 Surveillance team members

Dr. Andre Punt is a Professor at the University of Washington and Director of the School of Aquatic and Fisheries Sciences. He is a quantitative scientist with a specialty of providing quantitative scientific advice for fisheries management, focusing on new methods for assessing fish and marine mammal populations; Bayesian assessment

and risk analysis methods; and valuating the performance of existing methods for assessing and managing renewable resource populations. He uses methods for assessing fish and marine mammal populations that are tailored specifically to the situation in question. Current areas of interest are spatial models, individual-based models, and stage-structured models. He has worked as a resource population models for the Benguela Current in South Africa, a resource modeler at CSIRO in Australia, and at the University of Washington. He has a Ph.D. from the University of Cape Town in South Africa.

MRAG Americas confirms that Dr. Punt meets the competency criteria in Annex PC for team members as follows:

- He has an appropriate university degree and more than five years' experience in management and research in fisheries.
- He has passed the MSC's fishery team member training course.
- He has undertaken at least two MSC fishery assessments or surveillance site visits in the last five years.
- He is able to score a fishery using the default assessment tree and describe how conditions are set and monitored.

In addition, he has the appropriate skills and experience required to serve as a Principle 1 assessor as described in FCP Annex PC table PC3 as follows:

- He has 3 or more years' experience of applying relevant stock assessment techniques being used by the fishery or was primary author of 2 peer-reviewed stock assessments of a type used by the fishery under assessment.
- He has 3 or more years' experience working with the biology and population dynamics of the target species or species with similar biology.

MRAG Americas confirms he has no conflicts of interest in relation to the fishery under assessment.

Ms. Michealene Corlett joined MRAG Americas, Inc. in March 2018, where she currently works as the Senior Fisheries Program Manager. She received a B.S. in Aquatic and Fishery Science with a minor in Quantitative Science from the University of Washington School of Aquatic and Fisheries Science. Prior to joining MRAG Americas Michealene worked at the Washington State Department of Fish and Wildlife cooperating with inner agency and Tribal managers to monitor Pacific salmon populations in the Lake Washington basin. She has an extensive background in project management, and regulatory compliance and implementation. Her prior work as a project manager fostered strong client relations and the ability to work with a variety of stakeholders on sometimes contentious issues. Since joining MRAG, Michealene has provided support and collaborated on several fishery projects including Marine Stewardship Council, Responsible Fisheries Management and FISH Standard for Crew assessments. She currently participates on MSC assessment teams as an assessor for Principles 2 and 3 and as Team Leader. As the quality systems manager she was responsible for the application and improvement of MRAG Americas' quality management system ensuring compliance with ISO certification requirements.

MRAG Americas confirms that **Michealene Corlett** meets the competency criteria in Annex PC for team members as follows:

- She has an appropriate university degree and more than five years' experience in management and research in fisheries.
- She has passed the MSC's fishery team member training course.
- She has passed the MSC Traceability training module.
- She is able to score a fishery using the default assessment tree and describe how conditions are set and monitored.

In addition, she has the appropriate skills and experience required to serve as a Principle 3 assessor as described in FCP Annex PC table PC3 as follows:

- She has 3 or more years' experience as a practicing fishery manager and/or fishery/policy analyst/consultant.

MRAG Americas confirms she has no conflicts of interest in relation to the fishery under assessment.

The whole assessment team collectively meets the requirements as described in FCP Annex PC table PC3.

A discussion between team members regarding conflict of interest and biases was held and none were identified.

8	**Audit time and location**
	• A remote surveillance audit was held 10 November 2025 - 14 November 2025.

9	Assessment and review activities

The surveillance reviewed changes in science and management and monitored progress in closing out conditions.

- The following was reviewed during the audit:
  - Changes to the information provided in the Scope Declaration form.
  - Changes to the UoA and its management.
  - Performance in relation to any relevant conditions of the certification.
  - Any developments or changes within the UoA that affect traceability and the ability to segregate MSC from non-MSC products.
  - Any other significant changes in the UoA.
  - No PISG rescoring is took place, however progress for the ORH3B East & South Chatham Rise UoC will be recorded as part of the improvement program information.
- No modifications to the assessment tree were made.

4.2. Version details

The assessment was undertaken in accordance with the MSC Fisheries Certification Process and Guidance v2.3, MSC Fisheries Standard v2.01 and General Certification Requirements v2.7 which sets out the assessment and certification process. The default assessment tree for enhanced bivalves contained within MSC Fisheries Standard v2.01 was used to evaluate the fishery.

The table below specified the versions of the fisheries program documents used for this assessment.

Table 2: Fisheries program documents versions

Document/Assessment Tree	Version number/Type
MSC Fisheries Certification Process	Version 2.3
MSC Fisheries Standard	Version 2.01
Assessment tree	Default
MSC General Certification Requirements	Version 2.7
MSC Surveillance Reporting Template	Version 2.2

4.3. Update on the fishery

4.3.1. Principle 1

UoC 1: ORH 7A

Fishery performance and new survey data
The fishery in ORH 7A took 761 t (37.4% of the TACC of 885 t) during the 2024-25 fishing year. The 2024-25 catch reflects a decline of 14% compared to the 2023-24 fishing year. No stock assessment for ORH 7A was undertaken during 2025. An acoustic survey of ORH 7A has been scheduled for 2025 (FNZ, 2024) but the survey was not undertaken. The last full stock assessment for ORH 7A was undertaken during 2024, which led to a reduction to the TACC from 2,058 t to 885 t (FNZ, 2025a). The next acoustic survey for ORH 7A is expected to occur in July 2027 and the next stock assessment for 2028. The assessment of ORH 7A will be included in the planned external review of data and assessments for orange roughy.

UoA 2: ORH 3B ESCR—Self-suspended; not assessed as part of surveillance 1.

UoA 3: ORH 3B NWCR

Fishery performance and new survey data

The NWCR fishery took 30.7% of the agreed catch limit during the 2024–25 fishing year (FNZ, 2025b). The level of catch for 2024-25 continues the trend from 2015-16, whereby catches are lower than catch limits, with the catch limit utilization averaging 21.7% over the most-recent five fishing years. Reasons given for low catch limit utilization include that the Morgue hill is closed to fishing so that much of the catch is taken on the "flats" in the western part of NWCR. Tow durations continue to increase on average, with the 2024-25 fishing year having the lowest proportion of short tows.

The last acoustic survey of the ORH 3B took place during June/July 2022 (Ryan and Tilney, 2023), and the next acoustic survey of ORH 3B, including the NWCR, is scheduled for July 2026 (FNZ, 2024).

Stock assessment

A stock assessment for orange roughy on the NWCR was conducted during 2025 (Dunn et al., 2025a; FNZ, 2025b). The context for the assessment was research conducted during 2023 that identified several concerns with the assessments of the Northwest and (in particular) the East and South Rise stocks, although the estimated trajectory of stock biomass from the assessment for the 2018 NWCR was consistent with the acoustic biomass indices (FNZ, 2025b). Research was conducted during 2024 and 2025 to attempt to resolve these concerns (FNZ, 2025b) and this led to substantial changes to the form of the stock assessment used for 2025 stock assessment for the NWCR based largely on the decisions made for the assessment of orange roughy on the East and South of the Chatham Rise. Specifically:

- the length-frequency data were excluded from the assessment due to their excessive impact of biomass estimates;
- the age frequency data were excluded from the final models, and fishery and survey selectivity were set to the maturity ogive estimated from data on otolith transition zones; and
- estimates of year-class strength were penalized more than in previous assessments given the inability of the age data for orange roughy to distinguish cohorts effectively, with the final models for the NWCR not estimating deviations in recruitment about the assumed stock-recruitment relationship.

Dunn et al. (2025b) explored the evidence (observational based on fisher comments and model fits to catch per unit effort (CPUE) data) that fishery vessel disturbance can influence estimates of biomass from surveys. The disturbance effect corrected the CPUE trend for the Morgue hill for alternate years of higher and lower disturbance between 1996 and 2003, then increased CPUE when disturbance was relatively high during 2005 to 2008 (Figure 11 of Dunn et al, 2025). CPUE data were not used in the 2025 stock assessment for the NCWR.

The stock assessment did not lead to any proposals for changes to the TACC for the NWCR.

Model structure

The 2025 stock assessment updated the last assessment conducted during 2018. The 2025 stock assessment maintained much of the basic structure of the 2018 stock assessment (single-sex age-structured population dynamics model with a plus-group at 100 years). However, the maturity ogive was set to that estimated from the otolith transition information (ages at 50%- and 95%-maturity of 28.51 and 33.07 years). The model had two time-steps (a full year of natural mortality with spawning occurring after 75% of natural mortality; all mature fish were assumed to spawn). The assessment estimated natural mortality (M) with a N(0.045, 0.01485^2) prior and stock recruitment steepness was set to 0.75. Deviations in recruitment about the stock recruitment relationship were not estimated given the omission of the age- and length-composition data from the model likelihood.

The biomass indices used in the assessment are listed in Table 3. These are restricted to estimates based on AOS and that covered both of the Graveyard and Morgue hills. Two alternative sets of time-series were considered based on the 38 kHZ (runs denoted "Acoustic 38") and 120 kHz (runs denoted "Acoustic 120") results. An additional ("process error") CV of 0.2 was added the sampling CVs. The survey catchability parameter (q) was assigned a normal prior with mean 0.8 and CV 0.19. The value of 0.19 was derived from acoustic target strength uncertainty using the 38 kHz echosounder (FNZ, 2025b).

Table 3. Acoustic survey estimates of spawning biomass used in the assessment. Surveys covered both the Graveyard and Morgue hills. Only biomass indices estimated using the AOS system were included. The CVs do not include any process error. (source: FNZ, 2025b).

Year	Frequency	Snapshots	Estimate (t)	CV
2012	38 kHz	3	5 550	0.16
	120 kHz	3	4 254	0.16
2016	38 kHz	3	14 052	0.13
	120 kHz	3	12 494	0.10
2021	38 kHz	3	16 332	0.09
	120 kHz	3	13 228	0.09
2022	38 kHz	4	19 273	0.08
	120 kHz	4	13 680	0.08

Assessment results

The model fits to the acoustic indices that were acceptable (Figure 1) and the posteriors for survey *q* and *M* were similar to the priors (Figure 2). The results were sensitive to the value for the mean of the prior for *q*, as expected given the limited number of data points (FNZ, 2025b). Model configurations that fitted to the age-composition data were improved by estimating a block change in recruitment, but the results of this run were unrealistic (Dunn et al., 2025a) and not taken further.

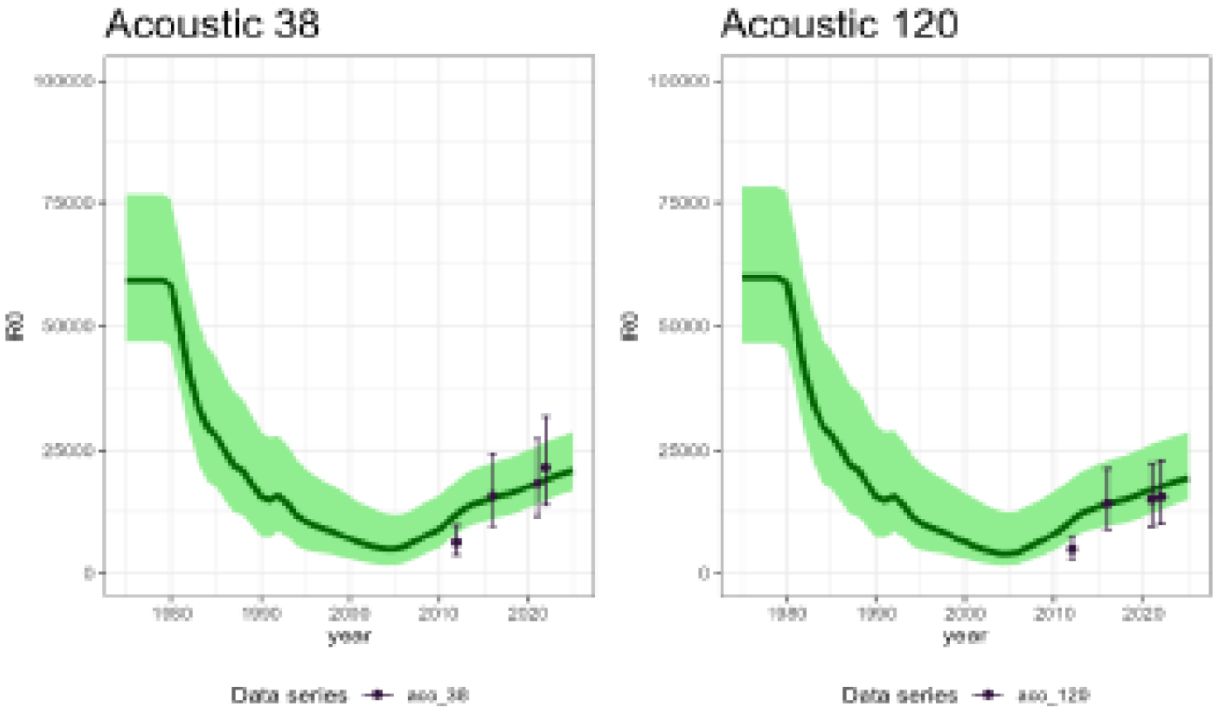

Figure 1. Assessment model runs Acoustic 38 and Acoustic 120, MCMC estimates of spawning stock biomass (solid line, median; shaded region, 95% credible intervals) and implied fits to the acoustic series (points; vertical lines, 95% CI). (Source: FNZ, 2025b).

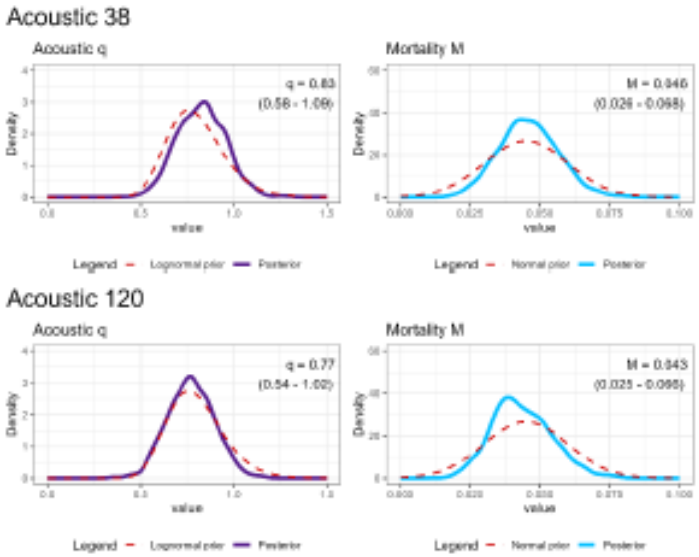

Figure 2. Assessment model runs Acoustic 38 and Acoustic 120, (left) prior (broken line) and the MCMC posterior (solid line) for survey catchability, with text giving the median and 95% credible intervals; (right) prior (broken line) and the MCMC posterior (solid line) for natural mortality rate (*M*) with text giving the median and 95% credible intervals. (Source: FNZ, 2025b).

The estimated time-trajectory of spawning stock biomass declines from the start of the fishery to 2004 after which it increases steadily (Figure 3). The sharp increase in biomass is attributable to substantial reductions in exploitation rate (Figure 4). FNZ (2025b) notes that a small proportion of the Acoustic 120 runs led to exploitation rates in excess of 100%.

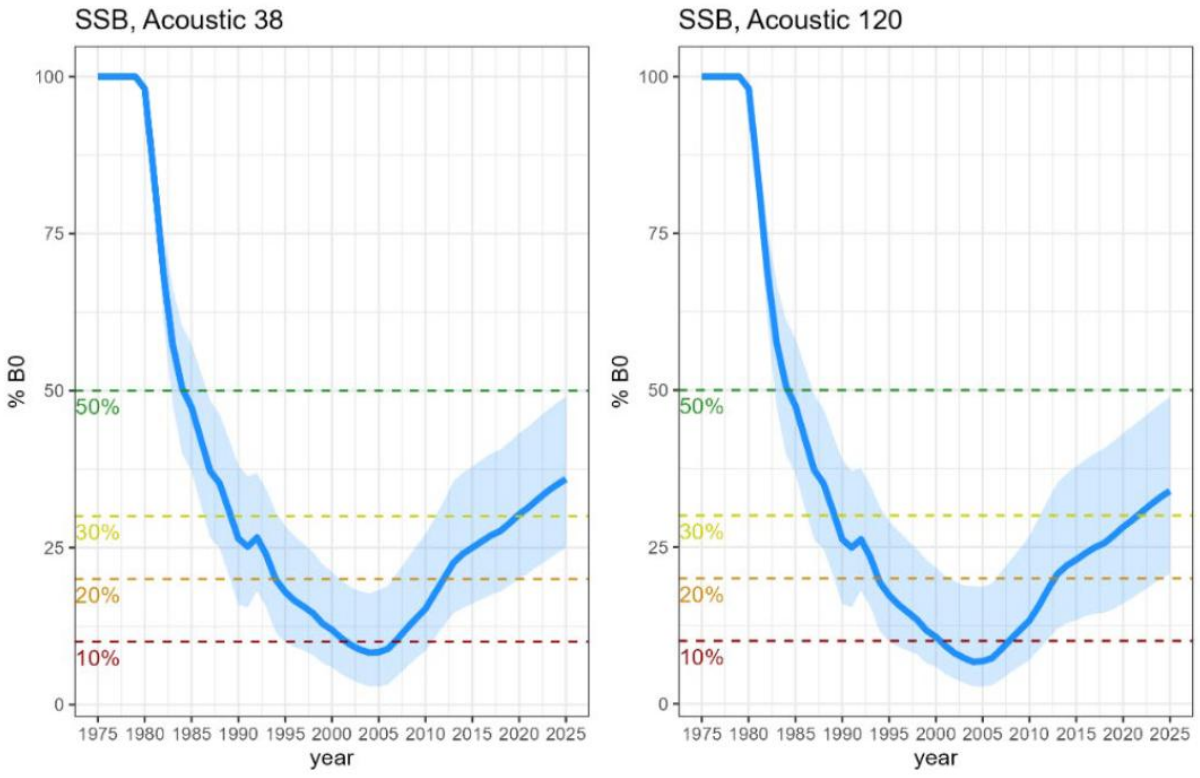

Figure 3. MCMC estimated spawning-stock biomass trajectory for assessment model runs using the 38 kHz AOS or 120 kHz AOS acoustic biomass series (solid line, median; shaded region, 95% credible intervals) Dotted lines indicate the hard limit (0.1 B_0) and soft limit (0.2 B_0), and dashed lines the management target range (0.3–0.5 B_0). (Source: FNZ, 2025b).

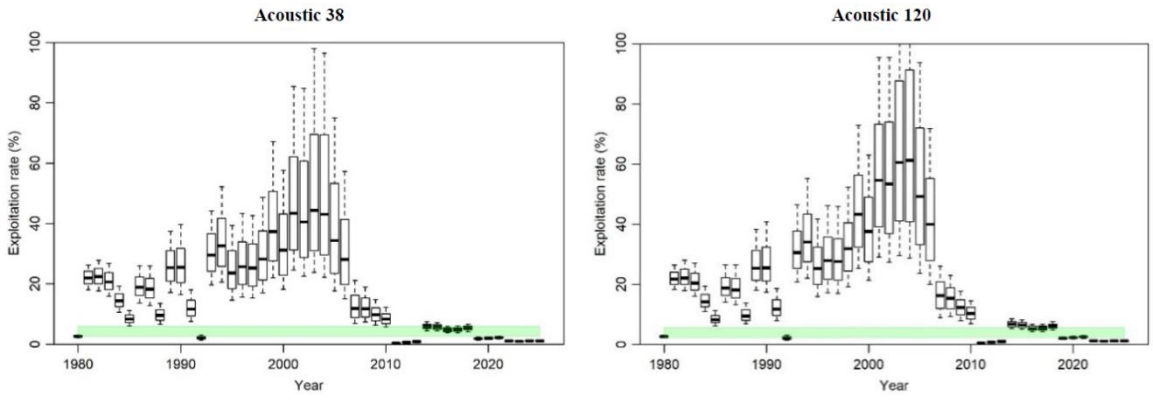

Figure 4. MCMC estimated exploitation rate trajectory for the two assessment model runs (boxplot where the solid line, median; outer box, interquartile range; whiskers 95% SI) Green shaded area indicates the exploitation rate corresponding to the target zone (U_{30} to U_{50}). (Source: FNZ, 2025b).

The stock is estimated to be within the management target range in terms of biomass and below the target exploitation rate (Figure 5; Table 4).

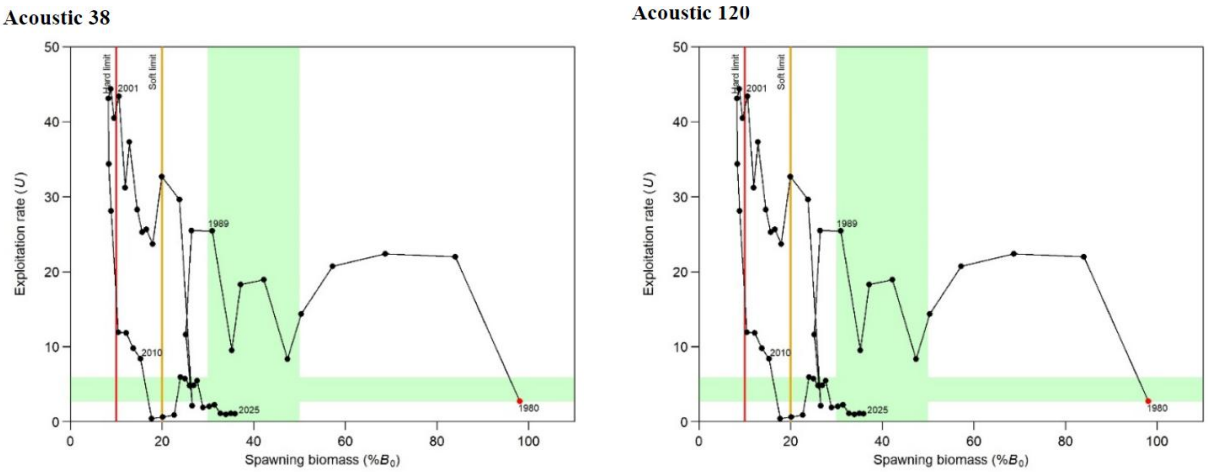

Figure 5. Historical trajectory of spawning biomass (% B_0), median exploitation rate (%), and exploitation rate for the two model runs. The biomass target range of 0.3–0.5 B_0 and the corresponding exploitation rate range are marked in green. The soft limit (0.2 B_0) and the hard limit (0.1 B_0) are marked in red. (Source: FNZ, 2025b).

Table 4. MCMC estimates of virgin biomass (B_0), stock status (B_{2025} as %B_0), and the probability of being above the lower (0.3 B_0) limit of the target range and below the soft (0.2 B_0) and hard limits (0.1B_0), for two model runs. (Source: FNZ, 2025b).

	B_0 ('000 t)	B_{2025}/B_0 (%)	P(>0.3 B_0)	P(<0.2 B_0)	P(<0.1 B_0)
Acoustic 38	59.2 (47.3-76.7)	21.1 (16.8-29.0)	0.84	<0.01	<0.01
Acoustic 120	59.9 (46.9-78.3)	19.5 (!5.0-28.9)	0.73	0.02	<0.01

The next stock assessment for the NWCR is scheduled for 2030 (FNZ, 2025b) The assessment of the NWCR will be included in the planned external review of data and assessments for orange roughy.

Projections

Five-year projections were conducted for a constant catch equal to the current catch limit (1 150 t) and the 2023-24 catch (212 t, plus a 5% overrun). The stock is expected to increase over the next five years under the current catch, with a <1% chance of falling below 0.2B_0 (Table 5). Spawning biomass is predicted to decline over the next five years under the current catch limit, although the probability of falling below 0.2B_0 is not expected to exceed 5% even under the more pessimistic Acoustic 120 model (Table 5).

Table 5. Bayesian median and 95% credible intervals (in parentheses) of projected B_{2030}, B_{2030} as a percentage of B_0), B_{2030}/ B_{2025} (%), and the probability (%) of SSB being below the lower bound of the target zone (0.3 B_0) and below the soft limit (0.2 B_0) in 2030. Projections made for current catch (212 t) and TACC (1 150 t), to which a 5% assumed catch over-run is added. (Source: FNZ, 2025b).

Model runs	Catch (t)	B_{2030} (t)	B_{2030} (%B_0)	B_{2030}/ B_{2025} (%)	P(B_{2030}>0.3 B_0)	P(B_{2030}>0.2 B_0)
Acoustic 38	212	22 950 (17 940–31 620)	39 (29–53)	109 (101–114)	95	0
Acoustic 38	1 150	18 620 (13 660–27 350)	31 (22–46)	89 (78–95)	59	1
Acoustic 120	212	20 490 (16 970–29 550)	36 (25–49)	110 (101–116)	84	<1
Acoustic 120	1 150	16 170 (12 630–25 170)	28 (19–42)	86 (78–94)	34	5

4.3.2. Principle 2

The Ministry for Primary Industries (MPI) Scientific Observer Program (SOP) collects data from fisheries, including Endangered, Threatened and Protected (ETP) incidental capture information. The ETP component of observer coverage under New Zealand law is administered and funded by the Department of Conservation (DOC) through levies recovered from relevant fisheries quota owners. All observer deployment is managed by the SOP.

The objective of the SOP is to collect data from fisheries for the following purposes:

- As an input to monitor key fisheries against harvest strategies
- As an input to monitor biomass trends for target and bycatch species
- To enable reliable estimations and nature of ETP species interactions and captures
- To enable timely responses to sustainability and environmental impact issues
- To provide a high level of confidence in fishers' at sea compliance with regulatory and non-regulatory measures. Over the most recent 5-year period, observer coverage in the NWCR and ORH 7A (UoA fishery areas has averaged 28% and 27%, respectively. This level of coverage is considered by MPI to be sufficient given the low level of ETP species captures and high level of overall compliance by orange roughy fisheries.

Over the most recent 5-year period, observer coverage in the NWCR (Table 6 and Figure 6 Observer coverage and fishing effort in the orange roughy fishery in NWCR. The most recent fishing year for which data are presented is 2024/2025.and ORH7A (Table 7 Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the ORH7A trawl fishery from 2020-21 to 2024-25 (FNZ, pers. comm)) UoA fishery areas has averaged 37% and 27%, respectively. This level of coverage is considered by MPI to be sufficient given the low level of ETP species captures and high level of overall compliance by orange roughy fisheries.

Table 6 Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the NWCR trawl fishery from 2020-20221 to 2024-2025 (Fisheries New Zealand, Pers comm)

NWCR	2020-21	2021-22	2022-23	2023-24	2024-25	5–year Average
Commercial tows	204	154	124	101	100	137
Observed tows	56	22	61	16	97	50
Observed tows (%)	27	14	49	16	97	37

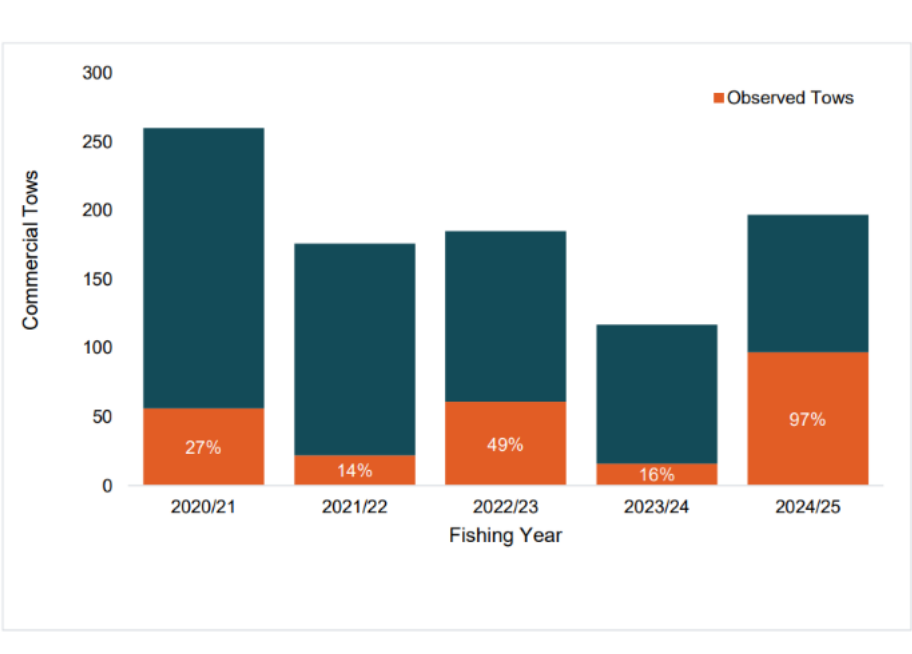

Figure 6 Observer coverage and fishing effort in the orange roughy fishery in NWCR. The most recent fishing year for which data are presented is 2024/2025.

Table 7 Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the ORH7A trawl fishery from 2020-21 to 2024-25 (FNZ, pers. comm)

Table 3. Numbers of commercial trawl tows and associated observer coverage for tows that targeted ORH in the ORH7A trawl fishery from 2020-21 to 2024-25 (Fisheries New Zealand, pers. comm.).

ORH7A	2020-21	2021-22	2022-23	2023-24	2024-25	5–year Average
Commercial tows	639	669	520	340	168	467
Observed tows	133	100	160	177	58	126
Observed tows (%)	21	15	31	52	35	27

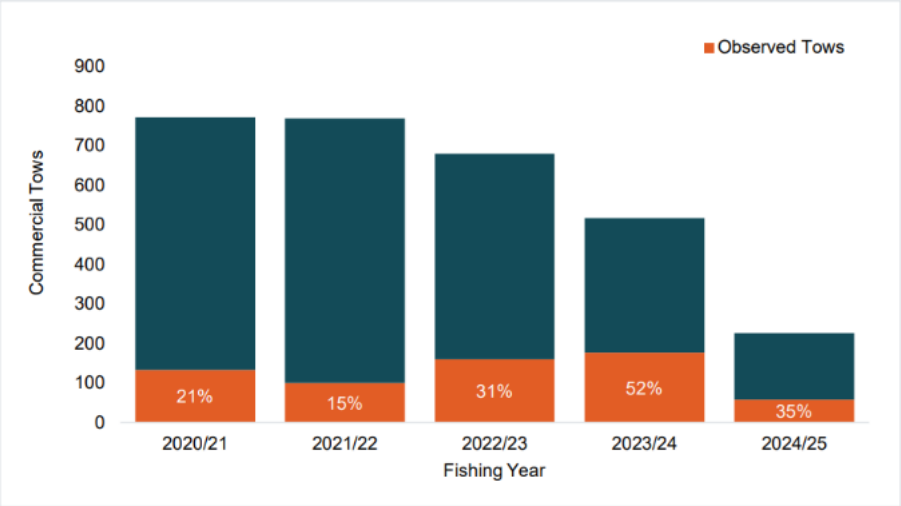

Figure 7 Observer coverage and fishing effort in orange roughy fisheries in ORH7A The most recent fishing year for which data are presented is 2024-25.

Non-target catch

In the Aquatic environment and biodiversity annual review (AEBAR), non-target fish and invertebrate catch is addressed for the various fisheries in New Zealand, including the New Zealand Orange Roughy trawl for stocks ORH 3B and ORH7A. The most recent assessment of orange roughy-trawl fishery mainly operates around the Chatham Rise, off the east coast from East Cape to Banks Peninsula, on the Challenger Plateau, and off the west and northeast coasts of the North Island. The fishery operates year-round with a peak in effort from June to July. According to the most recent assessment (Anderson & Finucci, 2022), in 2019–20, 32% of catch and 28.3% of tows were observed across the whole fishery.

Anderson and Finucci (2022) published a summary of non-target fish and invertebrate catch and discards in the NZ orange roughy and oreo trawl fisheries from 2002-3 through 2019-20. Their analysis of discards in the orange roughy fishery shows the following:

- Very low annual discards of non-target quota managed species (QMS) (between 1 and 46t annually with no obvious trend).
- Discards of non-QMS species ranged from 108t in 2013-14 to 1,504t in 2017-18 with no obvious trend over time.
- Annual discards of invertebrate species ranged from 5t to 140 t with levels in the first five years of the time series higher than in any subsequent year, after which they remained relatively steady.
- Of the main target species, total non-target catches were slightly more associated with orange roughy fishing than for oreo species.

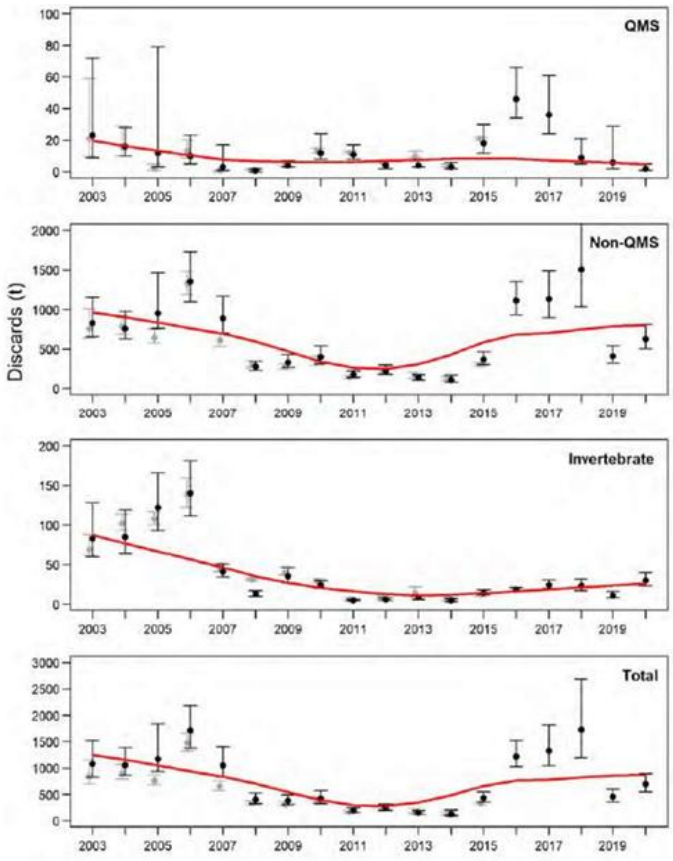

Figure 8 Annual estimates of discards in the target orange roughy trawl fishery, by species category, for 2002-2003 to 2019-2020 and equivalent estimates up to 2014-15 from Anderson et. al. (2017; grey dots). Error bars indicate 95% confidence intervals. The red lines show the fit of ta locally-weighted polynomial regression to annual discards. Source: Anderson and Finucci (2022), Figure 25.

Between 1 October 2015 and 30 September 2020, orange roughy made up around 80% of the total catch from observed tows targeting the species, with minimal discards. The main non-target species by weight were smooth oreo (4.8%), unspecified rattails (1.7%), shovelnose dogfish (1.3%), ribaldo (1%), unspecified slickheads (1%), and Johnson's cod (0.9%). While smooth oreo and ribaldo were rarely discarded, most of the other non-target species (all non-QMS) were discarded. Notable discard levels were also seen for white rattails and various deepwater shark and slickhead species. When grouped by broader taxonomic categories, osteichthyd (bony) fishes accounted for the largest proportion of non-target catch (12.2%), with 23% discarded, followed by sharks and rays (3.5%, with 76% discarded), and rattails and chimaeras. Among invertebrates, squid (0.4%), echinoderms (0.3%), and cnidarians (0.2%) each made up more than 0.1% of the catch, though these were mostly discarded (Anderson &Finucci, 2022).

According to the ORH 3B May 2025 Plenary Report (FNZ, 2025c), the main bycatch species are smooth oreo, black oreo, rattails, deepwater dogfish and hoki, with lesser bycatches of Johnson's cod and ribaldo. Low productivity bycatch species include deepwater sharks, skates, and corals. Observed incidental captures of protected species include corals, low numbers of seabirds, and occasional New Zealand fur seals. For ORH7A, bycatch levels have been reported to be relatively low, at about 4-5%. There were four observed incidental captures of seabirds and no observed incidental captures of marine mammals between 2002–03 and 2020–21 (FNZ, 2025d).

Catch data:

Each year, the assessment team reviews the observer catch data to review the classification of primary and secondary species in the fishery. This year, the observer catch data for UoC 1 (ORH 7A + Westpac) and UoC 3 (ORH 3B NWCR) between 2020 and 2025 were used to confirm the catch composition in the orange roughy UoCs. In both UoCs, orange roughy comprises the majority of the catch.

Catch composition by weight for each of the two UoCs was determined based on observer sampling data sourced from FNZ for the five-year period 2020-21 to 2024-25. The observer catch estimates are unadjusted.

<u>ORH7A</u>

Table 8b ORH7A average estimated catch composition of targeted ORH tows, in kilograms and percentage, from 2020-21 to 2024-25 based on observer data. Species with <0.01% estimated catch have not been included. Source: FNZ

Species	QMS/Non-QMS	Observer Estimated Catch	
		(kg)	(%)
Orange roughy	***QMS***	1,529,000.0	89.49
Rattails (RAT)	Non-QMS	41,918.0	2.45
Ribaldo (RIB)	QMS	35,788.9	2.09
Hake (HAK)	QMS	20,314.6	1.19
Sharks and dogfish, unspecified (OSD)	Non-QMS	13,883.4	0.81
Seal shark (BSH)	Non-QMS	10,819.8	0.63
Shovelnose dogfish (SND)	Non-QMS	6,979.4	0.41
Ghost shark, pale (GSP)	QMS	6,800.8	0.40
Slickhead (SLK)	Non-QMS	5,057.0	0.30
Australasian narrow-nosed spookfish (LCH)	Non-QMS	4,803.7	0.28
Spiky oreo (SOR)	QMS	4,211.9	0.25
Black slickhead (BSL)	Non-QMS	4,183.2	0.24
Hoki (HOK)	QMS	4,178.4	0.24
Unicorn rattail (WHX)	Non-QMS	3,310.2	0.19
Slender cods (HJO)	Non-QMS	3,215.0	0.19
Chimaera, wide-nosed (RCH)	Non-QMS	1,809.9	0.11
Leafscale gulper shark (CSQ)	Non-QMS	1,729.4	0.10
Morrids (MOD)	Non-QMS	1,703.8	0.10
Sea perch (SPE)	QMS	1,555.0	0.09
Baxter's lantern dogfish (ETB)	Non-QMS	1,545.6	0.09
Cardinal fish (CDL)	QMS	1,394.9	0.08
Longnose velvet dogfish (CYP)	Non-QMS	712.1	0.04
Portuguese dogfish (CYL)	Non-QMS	363.8	0.02
Javelinfish (JAV)	Non-QMS	358.4	0.02
Starfish (SFI)	Non-QMS	288.7	0.02
Smooth skin dogfish (CYO)	Non-QMS	262.4	0.02
White warehou (WWA)	QMS	212.0	0.01
Cape scorpionfish (TRS)	Non-QMS	204.9	0.01
Plunket's shark (PLS)	Non-QMS	199.6	0.01
Warty oreo (WOE)	QMS	150.8	0.01
Sea urchin; other (URO)	Non-QMS	136.4	0.01
Lanternfish (LAN)	Non-QMS	123.6	0.01
Deepwater dogfish, unspecified (DWD)	Non-QMS	118.0	0.01
Spinyfin (SFN)	Non-QMS	108.8	0.01
Smooth skate (SSK)	QMS	96.6	0.01
Giant squid (GSQ)	Non-QMS	95.6	0.01
TOTAL		**1,707,634.5**	**99.95**

QMS species

Targeted orange roughy trawl tows account for 89.49% of the total estimated catch by weight and the two QMS bycatch species with the next largest catches are ribaldo (2.09%) and hake (1.19%). Therefore, there are no primary species (>5% of the total catch) identified in the ORH7A catch.

Non-QMS species

Of the non-QMS bycatch species, the two species groups with the largest catches are rattails (2.45%) and unspecified sharks and dogfish (0.81%). Neither of these species are considered main, but the following data have been included based on the questionable stock size and/or that these species could be considered “less resilient” according to the MSC Standard based on their slow growth/longevity.

Rattails (*Macrouridae*) The IUCN has graded rattails in general 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. These species have depth and areal distributions that extend beyond the range of the fishing fleets (and substantially beyond that of the UoAs), so the IUCN concluded that fishing activities are not likely to cause a significant population decline at present. Although analytic stock assessments are not conducted for rattails, trawl surveys have monitored relative abundance on the Chatham Rise since 1992, including Bollon's rattail. In 2010, the surveys added a number of species, including four-rayed rattail. Bollon's rattail has shown no trends in abundance for the period since 1992, and four-rayed rattail no trends since 2010 according to the annual Chatham Rise trawl survey (https://tsip-uat.niwa.co.nz/search). Rattail bycatch in the NWCR fishery has fluctuated over the last 5 years but has a notable peak in the 2019-20 fishing year followed by a steady decline over the next four years.

The declining trend in the reported bycatch of rattails under the generic code 'RAT' could be attributed to the increasing use of species-specific reporting codes in recent years, noting that observers now record at least seven rattail species against individual codes. For the unspecified sharks and dogfish bycatch, in the ORH7A fishery, bycatch rates show substantial interannual variability, with a peak in 2021/22 followed by a sharp decline, reaching the lowest level in the most recent year. The decline in bycatch reported to group reporting codes for unspecified sharks and dogfish, is likely associated with the drive within the NPOA-Sharks to reduce the use of group codes and increasingly report to species codes. See Figure 9 below.

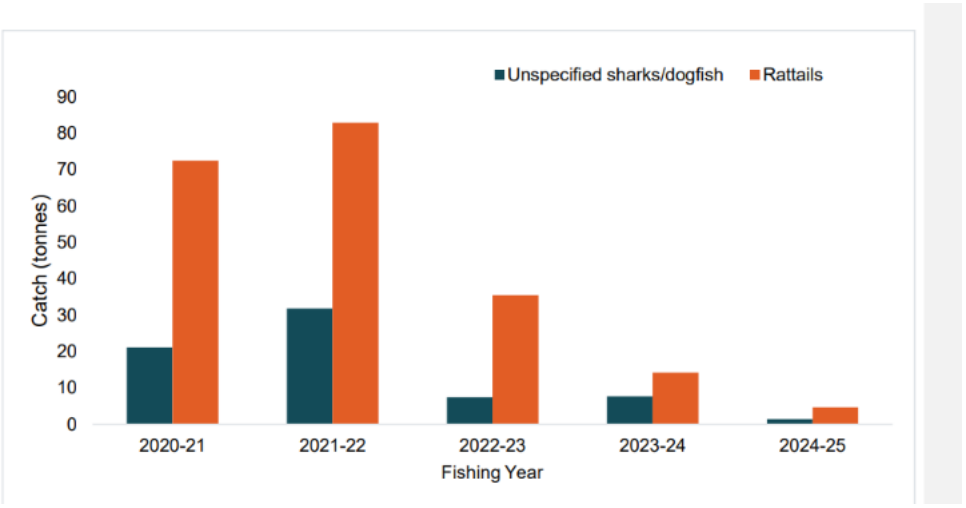

Figure 9 Bycatch of rattail and unspecified sharks and dogfish species in the ORH7A fishery from 2020-21 to 2024-25.

The reason(s) for the decline in bycatch of rattails is not clear. However, comparison with the biomass trend data from the West Coast South Island (WCSI) bottom trawl survey suggest that this is not due to a general decline in the abundance of rattails, as the WCSI survey biomass estimates of combined rattails shows no obvious declining trend over the timeseries but a drop in biomass between 2021 and 2024 which might explain the drop in bycatch levels seen (See Figure 10). Of the 22 species included, 88% of the estimated biomass across the survey timeseries is for one species, Bollons' rattail (*Coelorinchus bollonsi*), a fairly consistent estimate as the range has been between 73% and 93% over the timeseries. Bollons' rattail shows a similar pattern of observed biomass in the survey data to the combined species data, of fluctuation without trend but a reduction in biomass from 2021 of about 180 t to about 100 t in 2024; a scale of change (Figure 11).

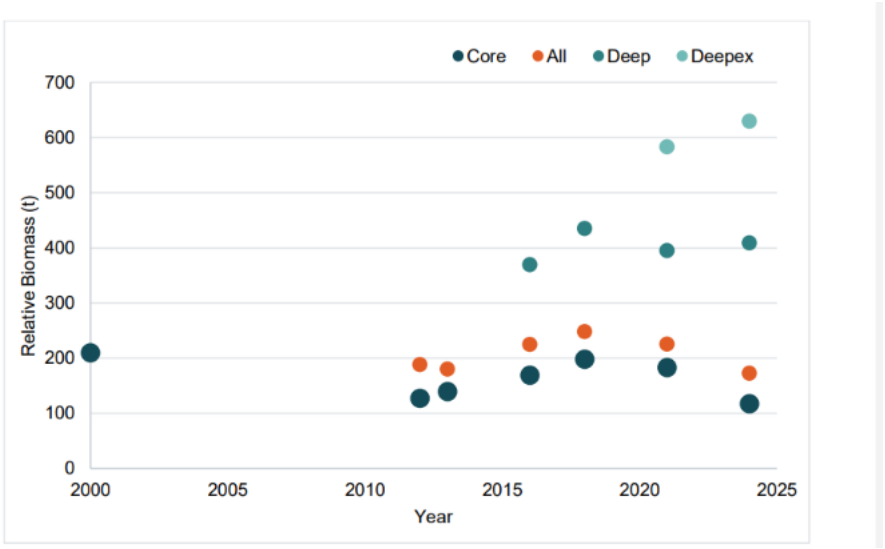

Figure 10 Estimated cumulative relative biomass (t) of 22 species of rattail reported in the Trawl Survey. Source: Portal for the WCSI bottom trawl survey series; niwa.co.nz/search

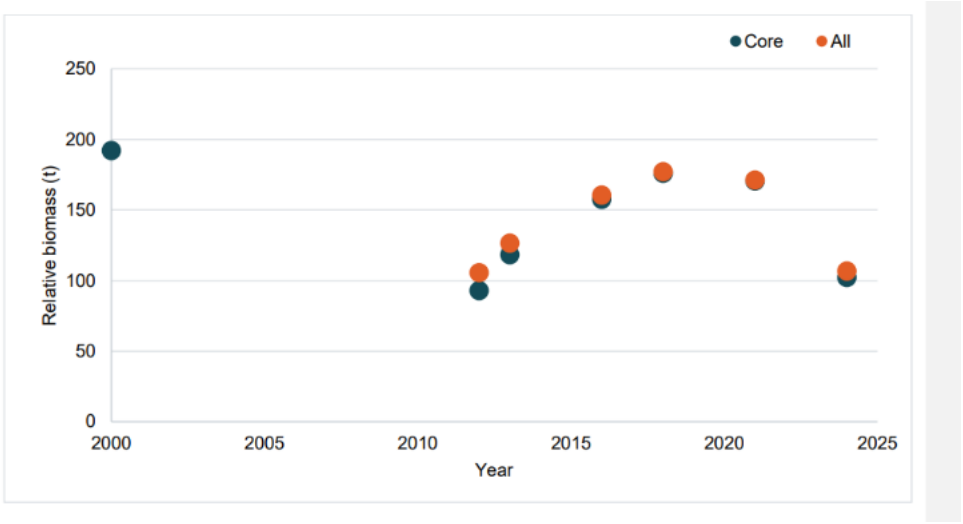

Figure 11 . Estimated relative biomass (t) of Bollons' rattail reported in the Trawl Survey Information. Source WCSI bottom trawl survey series.

NWCR

Targeted orange roughy trawl tows account for 77% of the total estimated catch by weight. The two most abundant QMS bycatch species in the NWCR are smooth oreo (5.45%) and hoki (2.8%), which is MSC certified.

Table 9 NWCR average estimated catch composition of targeted orange roughy tow, in kilograms and percentage, from 2020-2021 to 2024-2025 based on observer data. Species with <0.01% estimated catch have not been included. Source: FNZ *Note gaps in data are due to formatting.

Species	QMS/Non-QMS	Observer Estimated Catch	
		(kg)	(%)
Orange roughy	**QMS**	249,800.0	76.46
Smooth oreo (SSO)	QMS	17,813.8	5.45
Slickhead (SLK)	Non-QMS	11,462.8	3.51
Hoki (HOK)	QMS	9,162.4	2.80
Rattails (RAT)	Non-QMS	9,105.2	2.79
Slender cods (HJO)	Non-QMS	7,969.8	2.44
Morids (MOD)	Non-QMS	5,773.8	1.77
Sharks and dogfish, unspecified (OSD)	Non-QMS	3,020.0	0.92
Javelinfish (JAV)	Non-QMS	1,945.4	0.60
Shovelnose dogfish (SND)	Non-QMS	1,481.4	0.45
Clubhook squid (WSQ)	Non-QMS	1,070.8	0.33
Ghost shark, dark (GSH)	QMS	934.4	0.29
Baxter's lantern dogfish (ETB)	Non-QMS	890.4	0.27
Hake (HAK)	QMS	881.2	0.27
Seal shark (BSH)	Non-QMS	850.6	0.26
Australasian narrow-nosed spookfish (LCH)	Non-QMS	690.0	0.21
Chimaera, wide-nosed (RCH)	Non-QMS	623.2	0.19
Ghost shark, pale (GSP)	QMS	448.0	0.14
Basketwork eel (BEE)	Non-QMS	383.8	0.12
Ribaldo (RIB)	QMS	380.6	0.12
Chimaera, purple (CHP)	Non-QMS	379.6	0.12
Chimaera spp. (CHI)	Non-QMS	178.0	0.05
Deepwater dogfish, unspecified (DWD)	Non-QMS	177.4	0.05
Tam O'Shanter urchin (TAM)	Non-QMS	160.2	0.05
Spiky oreo (SOR)	QMS	151.8	0.05
Longnose velvet dogfish (CYP)	Non-QMS	150.8	0.05
Purple chimaera (CHG)	Non-QMS	119.6	0.04
Starfish (SFI)	Non-QMS	114.8	0.04
Black oreo (BOE)	QMS	72.0	0.02
Longnose deep-sea skate (PSK)	Non-QMS	68.8	0.02
Black cardinal fish (CDL)	QMS	61.8	0.02
Deepwater eel, unspecified (DWE)	Non-QMS	52.0	0.02
Warty oreo (WOE)	QMS	49.4	0.02
Ling (LIN)	QMS	42.5	0.01
Sea perch (SPE)	QMS	30.8	0.01
Small-headed cod (SMC)	Non-QMS	24.6	0.01
Hydrolagus spp. (HYD)	Non-QMS	18.4	0.01
Smooth skate (SSK)	QMS	18.2	0.01
Small-scaled brown slickhead (SSM)	Non-QMS	18.0	0.01
Sea urchin (URO)	Non-QMS	17.0	0.01
Deepwater king crab (KIC)	QMS	16.4	0.01
TOTAL		**326,609.7**	**99.97%**

Smooth Oreo (*Pseudocyttus maculatus*). The OEO4 management area for smooth oreo (reporting code SSO) overlaps the NWCR and ESCR UoAs. A 2019 stock assessment of SSO in OEO4 estimated B2018 at 40%B0 for the base model (FNZ 2021). B2018 is 'About as Likely as Not (40-60%)' to be at or above the target of 40%B0. 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). Smooth oreo was assessed in 2018 using a CASAL age-structured population model with Bayesian estimation, incorporating stochastic recruitment,

life history parameters, and catch history up to 2017–18 (FNZ 2021). The commercial catch limit for OEO4 is currently 3,600 tonnes, with a five-year average annual catch of smooth oreo of 2,594 t (range 2,327 to 2,781) for the years 2019-20 to 2023-24. There has been no new stock assessment for this species since the last surveillance audit.

Non-QMS species

Of the non-QMS bycatch species, the two species groups with the largest catches are slickheads (3.51%) and rattails (2.79%). Neither of these species qualify as primary main, but data are presented below due to the slow-growing, late maturity characteristics of deep-sea species.

Slickhead (*Alepocephalidae*) bycatch in the NWCR fishery has been variable over the last 5 years, with a low in 2021/22 followed by a sharp increase and sustained higher levels in subsequent years. Rattail bycatch in the NWCR fishery have annual values that have varied substantially across the five-year period, with peaks in 2020/21 and 2022/23 followed by a steady decline in subsequent years (Figure 12).

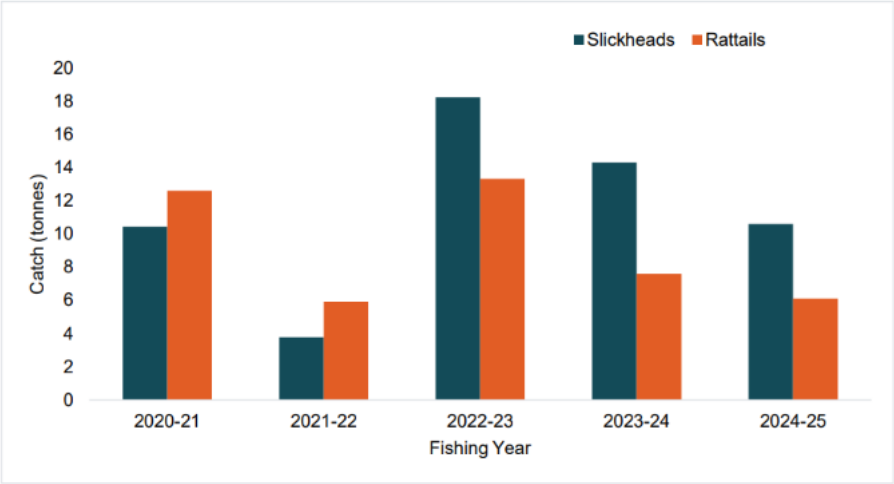

Figure 12 Bycatch of rattail and slickhead species (in tonnes) in the NWCR fishery from 2020-21 to 2024-25.

The New Zealand field guide to common species caught in bottom and mid-water trawling describes 5 species of slick heads and 51 species of rattails (McMillan et al., 2024) and bottom trawl surveys on the Chatham Rise, primarily to estimate the abundance of hoki and middle-depth and deepwater-species, also yield biomass estimates for a range of bycatch species. The 2024 trawl survey in the Chatham Rise recorded 4 slickhead and 30 rattail species taken during tows to estimate the abundance of hoki and middle-depth and deepwater-species.[1] On the NWCR, big-scaled brown slickhead was the most widespread slickhead species, occurring throughout the survey area, while small-scaled brown slickhead was more abundant on the southern Rise. with no trend in abundance over the period 2010-2024, when data were available (Figure 13).

[1] https://tsip-uat.niwa.co.nz/search

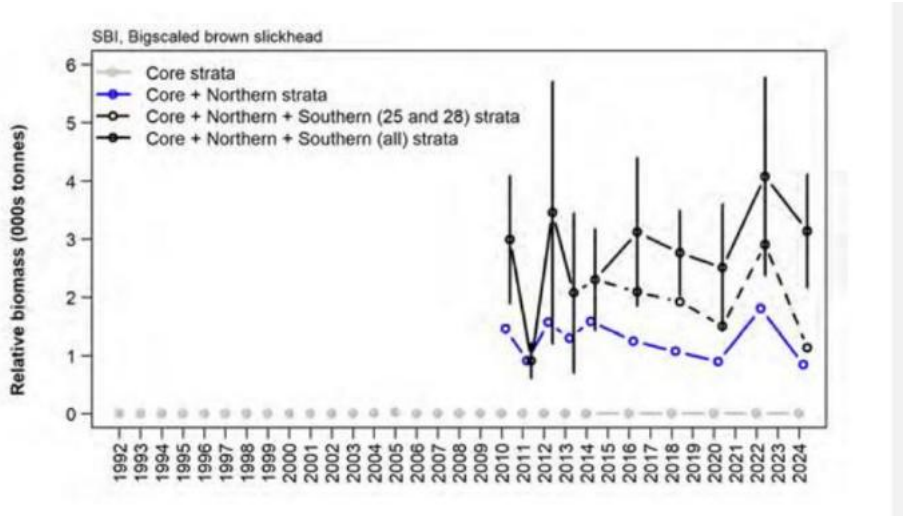

Figure 13 Relative biomass estimates (thousands of tonnes) of bigscaled brown slickheads sampled by bottom trawl surveys of the Chatham Rise from 1992 to 2024. Grey lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1300 m) strata. Black solid lines show fish from core strata plus the northern and southern deep (800–1300 m) strata, and black dotted lines show fish from core strata plus the northern and southern 25 and 28 deep strata (800–1300 m). Error bars show ± 2 standard errors.

On the NWCR, four-rayed rattail was the most common rattail species, being widespread and relatively abundant across the northern Rise, with no trend in abundance over the period 2010-2024, when data were available. (Figure 14).

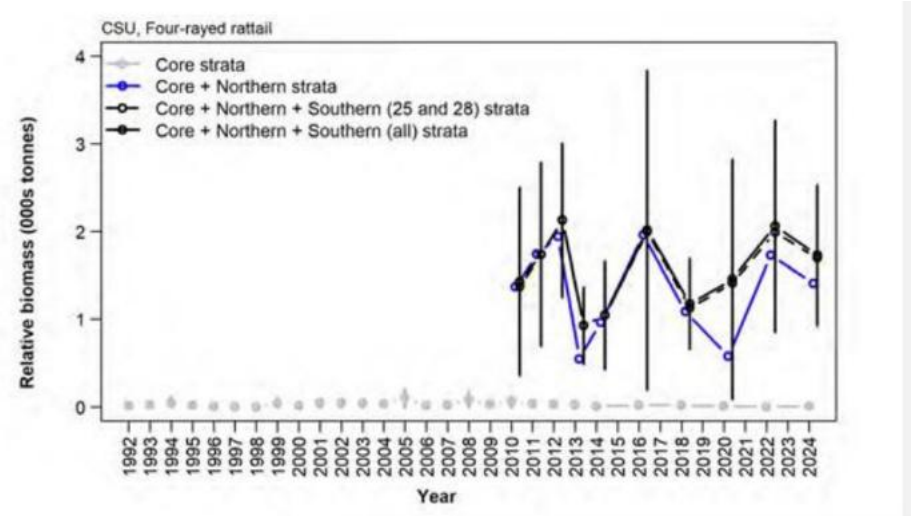

Figure 14 Relative biomass estimates (thousands of tonnes) of four-rayed rattails sampled by trawl Grey lines show fish from core (200–800 m) strata. Blue lines show fish from core strata plus the northern deep (800–1300 m) strata. Black solid lines show fish from core strata plus the northern and southern deep (800–1300 m) strata, and black dotted lines show fish from core strata plus the northern and southern 25 and 28 deep strata (800–1300 m). Error bars show ± 2 standard errors

Table 9 shows that unidentified deepwater sharks and dogfish make up the largest elasmobranch group catch at 0.92% while the single elasmobranch species with the greatest catch is the shovelnose dogfish at 0.45%. The most abundant chimaerid is the dark ghost shark at 0.29% of the catch. The clubhook squid, at 0.33% of the catch is the most abundant of the invertebrate species. No single species exceeds 5% of the overall catch and none is therefore a minor primary species.

Endangered, Threatened and Protected (ETP) Species

ORH7A

Over the past five years, seabird captures in the 7A fishery have varied, with a total of six observed captures (Figure 16). In the two most recent fishing years, no seabirds were captured. Of the six recorded captures, two were an unidentified petrel, prion, or shearwater – one alive and uninjured, and one dead. The remaining captures included one white-capped albatross, found alive and uninjured, and two unidentified albatrosses, of which one was alive and

uninjured, and one was dead.

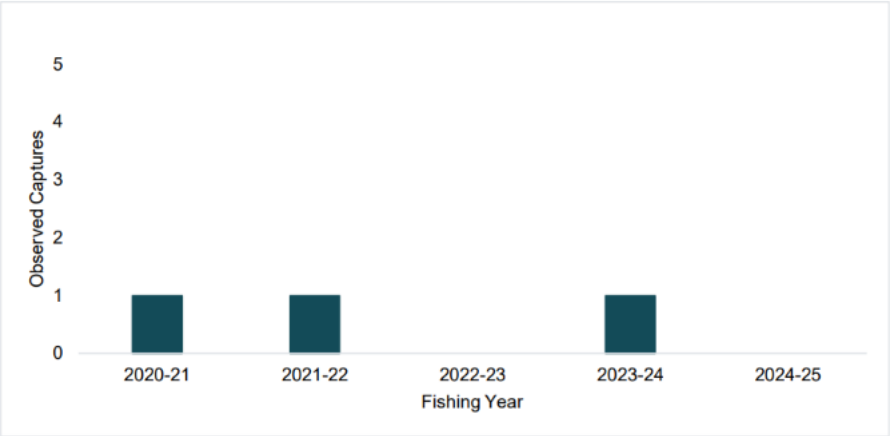

Figure 15 Observed New Zealand seabird captures in the 7A-WB UoA (Fisheries New Zealand, pers. Comm)

NWCR

Over the past five years, seabird captures in the NWCR UoA fishery have remained low and stable, with a total of three observed captures. In the most recent fishing year, no seabirds were captured. Of the three recorded captures, two were an unidentified petrel, prion, or shearwater – one alive and uninjured, and one dead. The remaining capture was an unidentified albatross, which was found alive and uninjured (Figure 16).

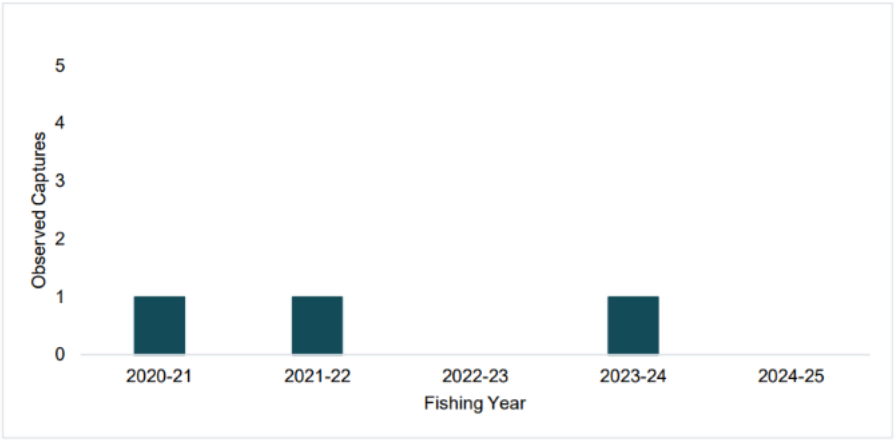

Figure 16 Observed seabird captures in NWCR (FNZ, pers. comm)

Mammals

In the 2024-25 fishing year, there were no observed captures of New Zealand sea lion, New Zealand fur seals or any whales or dolphins in either the 7A or NWCR orange roughy trawl UoAs. No estimates of total interactions were made.

Habitats

A condition is open for Performance Indicator 2.4.2 and potential interactions with sensitive benthic organisms such as corals.

ORH7A

Observed ETP coral catches during the period 2020-21 to 2024-25, based on observer records obtained from MPI, show that the ORH7A fishery estimated annual catches range from 0 to 18.5 kg, with no apparent trend (Table 10).

Table 10 ORH7A observed and estimated coral catch (kg) from fishing years 2020-21 to 2024-25 (FNZ, Pers. Comm)

Species	Observer Reported Catch (kg)				
	2020-21	2021-22	2022-23	2023-24	2024-25
Gorgonian coral – Bushy bamboo (ACN)	0	0.1	0	0.1	0
Black coral – *Bathypathes* spp. (BTP)	0	0	0	0.1	0
Black coral (COB)	0	0	0	0	0.4
True coral (unidentified; COU)	0	0.8	0	0	0
Gorgonian coral – Bamboo coral (ISI)	0	0	0	0.51	0
Gorgonian coral – *Lepidisis* spp. (LLE)	0	1	0.1	0	0
Golden coral – *Radicipes* (RAD)	0	1	0	0	0
Stony coral (SIA)	0	0	0	0	0.4
Stony coral – *Stephanocyathus platypus/spiniger* (STP)	0	0	5.6	0.3	0
TOTAL	**0**	**2.9**	**5.7**	**1.01**	**0.8**
Total Tows	639	669	520	340	168
Observed Tows	133	100	160	177	58
Observer Tows (%)	21	15	31	52	35
Estimated Coral Catch (kg)	0	19.4	18.5	1.9	2.3
Estimated Coral Catch/100 Tows (kg)	0	2.9	3.6	0.6	1.4

NWCR

Observed ETP coral catches during the period 2020/21 to 2024/25, based on observer records obtained from MPI, show that the NWCR fishery estimated annual catches range from 0 to 6,002.5 kg, with no apparent trend (Table 11). Review of the reported 6,000 kg coral catch confirmed that the material consisted primarily of mud and dead coral.

Table 11 NWCR observed and estimated coral catch (kg) from fishing years 2020-21 to 2024-25 (Fisheries New Zealand, Pers. Comm)

Species	Observer Reported Catch (kg)				
	2020-21	2021-22	2022-23	2023-24	2024-25
Gorgonian coral – Bushy bamboo (ACN)	0.1	0	0	0	0
Hydrocoral – *Bathyalcyon robustum* (ARO)	0	0	0	0.1	0
Black coral – *Bathypathes* spp. (BTP)	0	0.2	0	0	0
Black coral (COB)	0	0	0	0.1	0
True coral (unidentified; COU)	1	0.2	0	0	0
Stony coral – *Desmophyllum dianthus* (DDI)	0	0	0	1.6	0
Black coral – *Dendrobathypathes* spp. (DEN)	0	1	0	0	0
Stony coral – *Goniocorella dumosa* (GDU)	0	0	0	265.2	2.4
Gorgonian coral – Bamboo coral (ISI)	0	0	0	0.8	0
Gorgonian coral – Bamboo Coral – *Isidella* (ISP)	0	0	0	0.2	0
Gorgonian coral - *Lepidisis* spp. (LLE)	0	0	0	0.8	0
Black coral – *Parantipathes* (PTP)	0	0	0	0.1	0
Stony coral (SIA)	340	0	0	0.4	6,000
Stony coral – *Stephanocyathus platypus/spiniger* (STP)	1	0	0	0.4	0.1
TOTAL	**342.1**	**1.4**	**0**	**269.7**	**6,002.5**
Total Tows	204	154	124	101	100
Observed Tows	56	22	61	16	97
Observer Tows (%)	27	14	49	16	97
Estimated Coral Catch (kg)	1246.7	9.8	0.00	1,702.3	6189.2
Estimated Coral Catch/100 Tows (kg)	610.1	6.4	0	1685.4	6189.2

Vessel-reported Catch

Vessels are required by regulation to report all protected species captures using Non-Fish Protected Species forms, whether or not an observer is on board. Records show that, for the most part, vessels in 7A-WB and reported more catch than observers, as would be expected given the levels of observer coverage.

Table 12 Vessel-reported and observer-reported coral catch (kg) in NWCR and 7A-WB from fishing years 2020-21 to 2024-25 (FNZ, Pers. Comm).

Year	NWCR Catch (kg)		7A-WB Catch (kg)	
	Commercially Reported	Observer Reported	Commercially Reported	Observer Reported
2020-21	405.3	342.1	0	0
2021-22	1190.47	1.4	0.86	2.9
2022-23	0	0	1.45	5.7
2023-24	220.98	269.7	1.1	1.01
2024-25	6003.65	6002.5	1.12	0.8

Assessment of Trawling Interactions (Pers. Comm, Deepwater Council, 2025)

A key tool for assessing the probable effects of trawl fishing on ETP coral communities has been to assess the extent of overlap between the fishery footprint and areas where corals are known to occur (i.e. the observed coral distribution). Bottom trawl records for all tows that targeted ORH over the three-year period 2018-19 to 2020/21were plotted against observer-reported, vessel-reported, and research coral datasets (the 'observed' coral distribution), using GIS to determine the overlap within the ORH habitat depth range of 800 –1,600 m. The method involves coral capture localities being expressed as cells of 1 km x 1 km in extent, which are then overlaid with the recent trawl footprint to provide an indication of probable fishery impact. However, the 'observed' coral dataset is not representative of the overall distribution of corals because the majority of the records originated from the fishing grounds. The research dataset cannot be assumed to be representative of the distribution, either by area or depth, as it is predominantly based on trawl survey records, which have the objective of assessing the biomass of fished stocks and not the nature and extent of epibenthic fauna. These are strong reasons not to rely solely on the 'observed' coral distribution as a basis for assessing the impact of UoA fisheries on coral habitat. There is evidence that many of New Zealand's deepwater protected corals occur deeper than the maximum depths currently fished (i.e. ~1,400 m), with maximum depth records as follows:

• Black corals: 2,440 m

• Gorgonian octocorals: ~2,990 m

• Scleractinian stony corals: 2,860 m

• Hydrocorals: ~2,530 m59

The observer-reported coral catch composition for the years 2020-21 to 2024-25 showed the following:

ORH7A

Stony coral formed the bulk of the coral catch. Small quantities of unidentified true corals, black coral, gorgonian coral and golden coral were recorded (based on Table 10).

NWCR

Stony coral formed the bulk of the coral catch. Small quantities of unidentified true corals, black coral, hydrocoral, and gorgonian coral were recorded (based on Table 11).

Trawl Footprint

The distribution of the trawl footprint for ORH shows a significant contraction in 2021 compared to the trawl footprint over the period 1990 – 2021 and now focuses on areas with the highest probability of capture. The latest trawl footprint report, released in September 2024, presents a spatial analysis of bottom contacting trawl effort by commercial trawlers within the EEZ, in waters open to trawling to a maximum depth of 1,600 meters, for different time periods based on the most recent data. The latest trawl footprint analysis shows that for the deepwater data between 1990 and 2022, the overall footprint contacted was 8.7% of the EEZ and territorial sea, representing 25.8% of the fishable area. From 2006 onwards, the annual overlap has been 1.0 – 1.2% of the EEZ and territorial sea, representing 2.9 – 3.7% of the fishable area. The data show that the numbers of tows by ORH/OEO targeted fisheries has remained fairly consistent over the period 2016 – 2021(MacGibbon & Mules, 2023). See Figure 17.

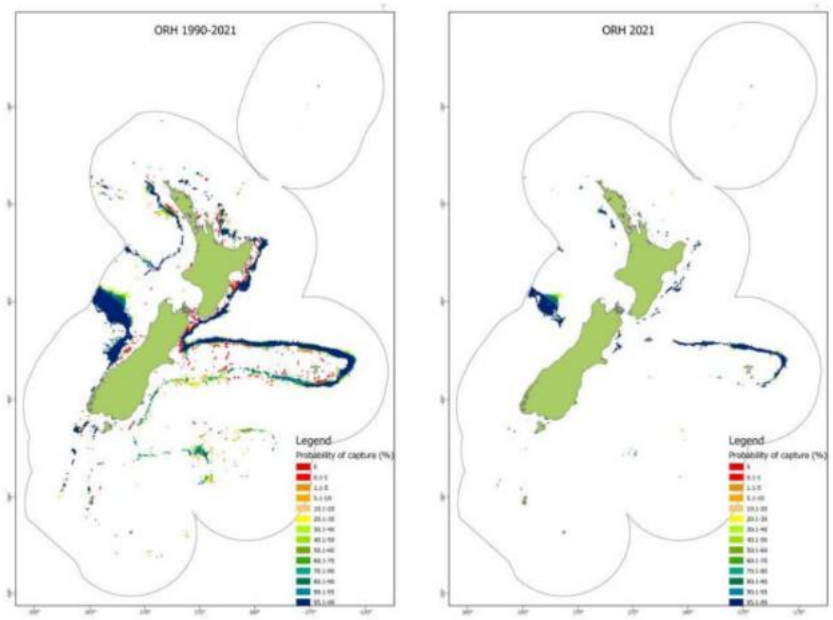

Figure 17 . Distribution of the 1990 – 2021 (left) and 2021 trawl footprints (right) for orange roughy displayed by 25km2 contacted cell, relative to the probability of capture for that species (MacGibbon and Mules, 2023)

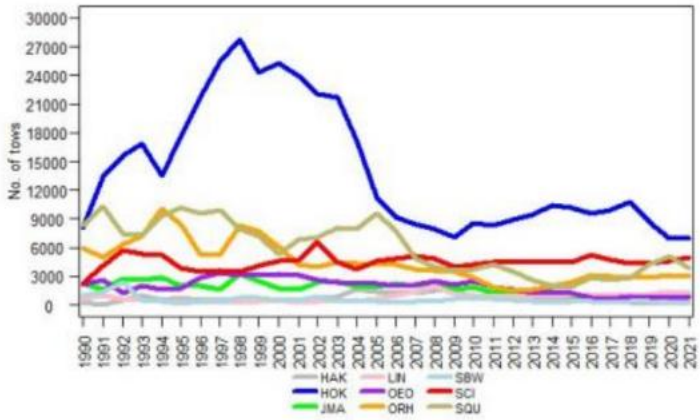

Figure 18 The number of bottom-contacting tows by year for the period 1990 - 2021 for deepwater tier 1 species.

The following key observations were made:

ORH7A

For the period 1990 – 2021 the trawl footprint for ORH/OEO-targeted tows in ORH 7A was 11,187 km2 and contacted 1,568 cells. The trawl footprint remained low for four years from 2011, when the fishery was reopened to commercial fishing, and then showed an increasing trend through to 2021. The number of 25 km2 cells contacted showed a similar trend. This pattern is also broadly consistent with the changes in the TACC.

Fishing effort in ORH 7A showed an expansion over a wider area in 2020 and 2021 (Figure 19)

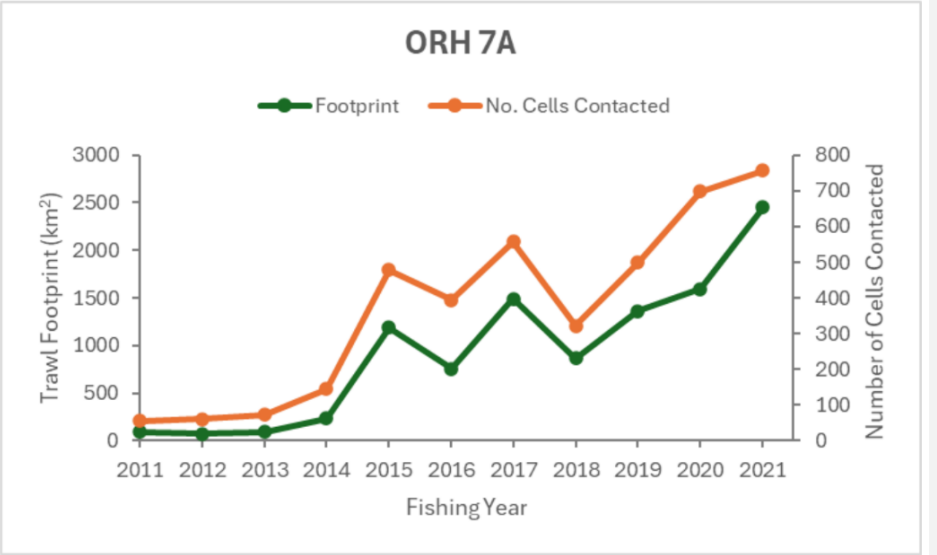

Figure 19 The number of contacted 25 km2 cells and footprint (km2) for combined targets ORH/OEO bottom-contacting trawls in ORH 7A from 2011 – 2021.

NWCR

For the period 1990 – 2021 the trawl footprint for ORH/OEO-targeted tows in NWCR was 7,057 km2 and contacted 861 cells.

The trawl footprint remained low from 2011 – 2013 when much of the catch was taken from UTFs. The fishery moved progressively to longer tows on slope habitat from 2014 and then showed a contraction from 2017-19, which broadly corresponds with the reductions in the TACC. The number of 25^{km2} cells contacted showed a similar trend

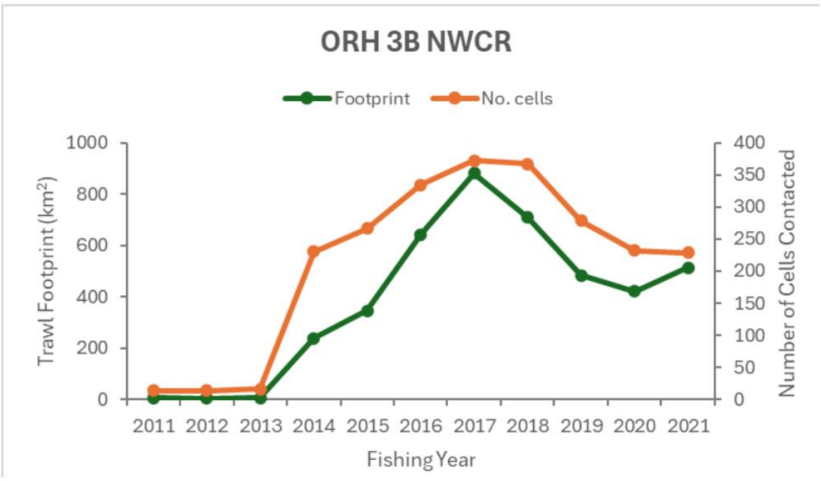

Figure 20 The number of contacted 25km2 cells and footprint (km2) for combined targets ORH/OEO bottom-contacting trawls in NWCR from 2011 – 2021.

Maps showing the extent of the recent trawl footprints in relation to the orange roughy habitat areas for each of the UoAs are provided in the figures below.

In ORH 7A, there has been an expansion of the fishery towards the south-east, reflective of the fishery increasingly operating outside of the spawning area (the spawning area is in the extreme western part of ORH7A) (Figure 21).

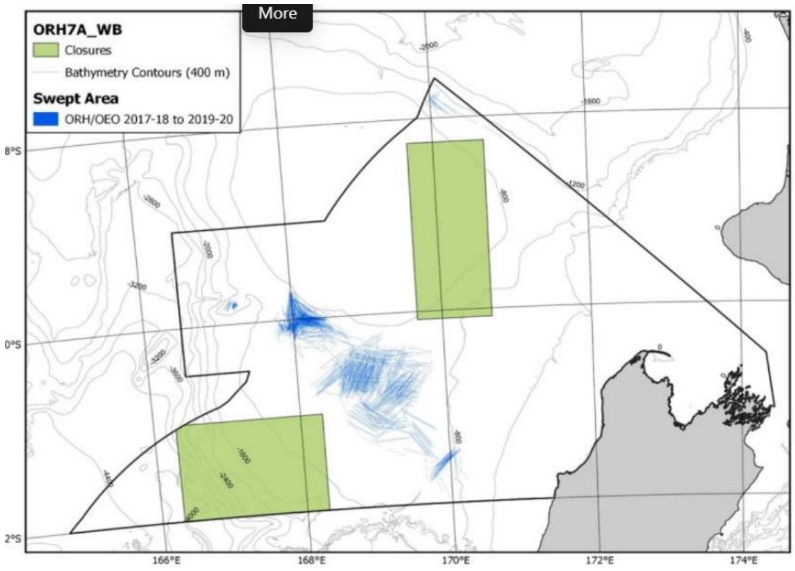

Figure 21 ORH 7A UoA trawl footprint for ORH/OEO targeted tows and for HAK/HOK/LIN targeted tows with starting depths ≥ 800 m, 2017-18 to 2019-20.

In NWCR, most fishing in recent years has occurred on flat habitat to the south and west of the 180˚ hills in recent years and much of the 'new area' traversed has involved in-filling between existing trawl tracks within the traditional fishing grounds, as acknowledged by Baird & Mules, 2023 (Figure 22).

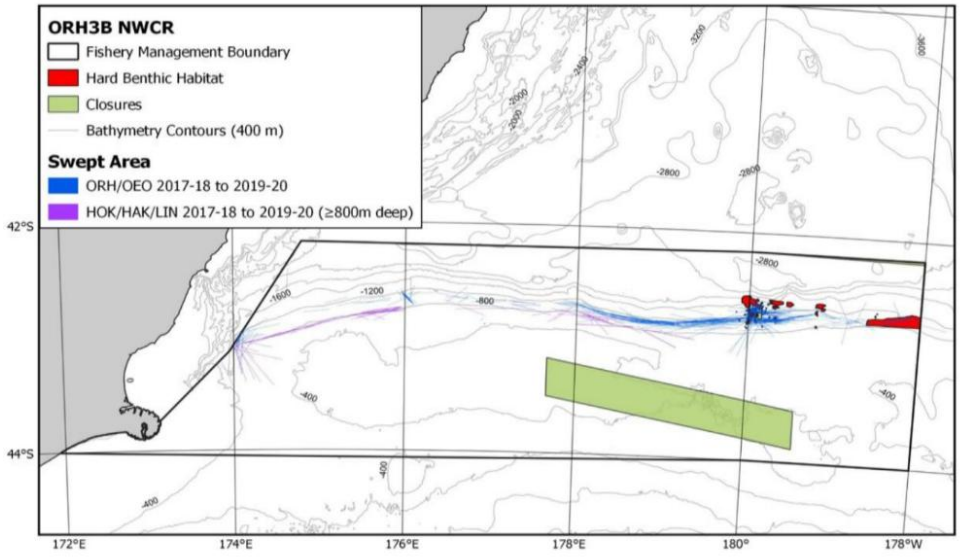

Figure 22 NWCR UoA trawl footprint for ORH/OEO targeted tows and for HAK/HOK/LIN targeted tows with starting depths ≥ 800 m, 2017-18 to 2019-20.

Improved Trawl Footprint Methodology

An Electronic Reporting System (ERS) was introduced for all New Zealand trawlers from 2019. This involved real-time reporting of tow start and tow end positions, and near-real-time reporting of catches by tow, directly to Fisheries New Zealand via satellite. Mandatory Vessel Monitoring Systems (VMS) aboard vessels additionally report vessels' geospatial positions automatically to Fisheries New Zealand at a frequency of every 3 – 10 minutes (Geospatial Position Reporting, GPR). In calculating trawl footprint, the tow-start and tow-end positions are used as a proxy for the 'probable' bottom contact by trawl gear. However, as trawl tows are often not in a straight-line, it was suspected that this method may under-estimate the 'true' trawl footprint. As a result, in 2023, a method using GPR data was trialled for determining a more accurate trawl footprint. The difference between use of ERS and GPR data is illustrated in Figure 23. The trial showed that, for tows that had corresponding GPR data, the trawl footprint was slightly larger; the GPR:ERS trawl footprint ratio being 1.04 (i.e. 4% larger) (MacGibbon & Mules, 2023).

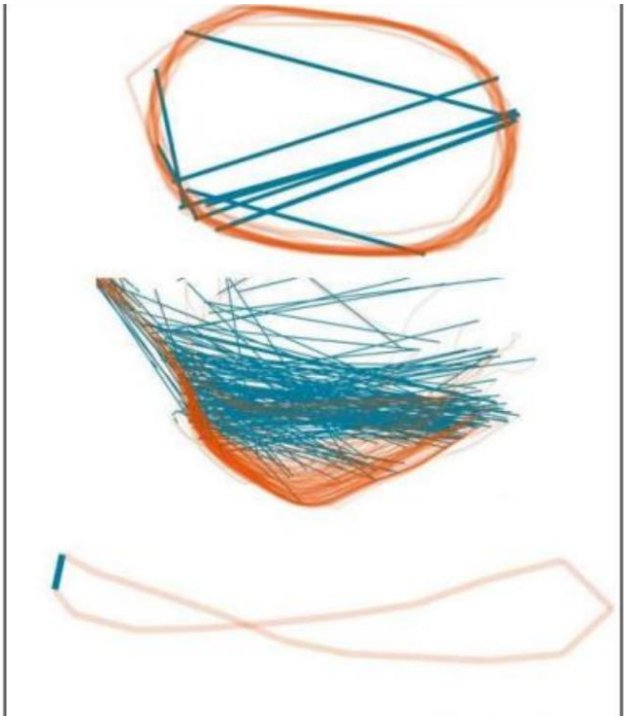

Figure 23 A selection of trawl paths created using GPR data (orange lines) and the corresponding tows created using the 'traditional ERS straight-line' method (green lines).

4.3.3. Principle 3

Fisheries New Zealand under the ministry for Primary Industries (MPI) manages the orange roughy stocks in New Zealand. The management of New Zealand's deepwater fisheries is a collaborative arrangement between Fisheries New Zealand (FNZ) and the commercial fishing industry, represented by the Seafood New Zealand Deepwater Council (DWC). Within the deepwater fisheries, fish stocks have been categorised into three tiers. Tier 1 fisheries are high volume and/or high value fisheries and are usually targeted. All New Zealand orange roughy stocks are considered as Tier 1 stocks and are managed via a quota management system (QMS) that have catch limits in place that are based on research to keep the stocks healthy. For QMS managed species, there is an annual limit of how much can be caught. This is the total allowable catch (TAC), which is divided among commercial fishers, recreational fishers and customary fishers[2].

A review of ORH3B was completed following the 2025 stock assessment. As a result, the Minister has adjusted catch settings to support long-term management objectives. The TACC for ORH3B has been revised, with the reduction applied to the East and South Chatham Rise (ESCR) sub-area (not part of this assessment). Catch limits for the NWCR fishery remains unchanged, as recent information indicates these areas continue to perform within management expectations. The new settings are supported by ongoing monitoring and planned research to inform future assessments (MOF, 2025).

The current TACC for 2025 for the total ORH 3B stock was reported to be 4,752 t, with the total catch limit for the NWCR at 1,150t. The TACC for ORH 7a was reported at 885 t, with a reported catch at 761t. See the following figures for the catch vs TACC for each of these stocks.

[2] https://www.mpi.govt.nz/legal/legislation-standards-and-reviews/fisheries-legislation/quota-management-system

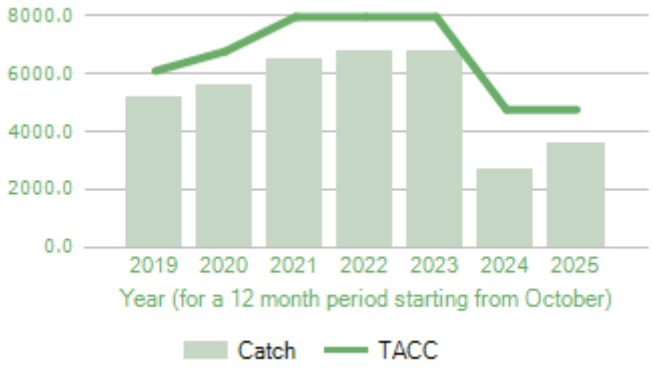

Figure 24 Commercial catch vs TACC trend for all of ORH 3B. Source: Fisheries New Zealand

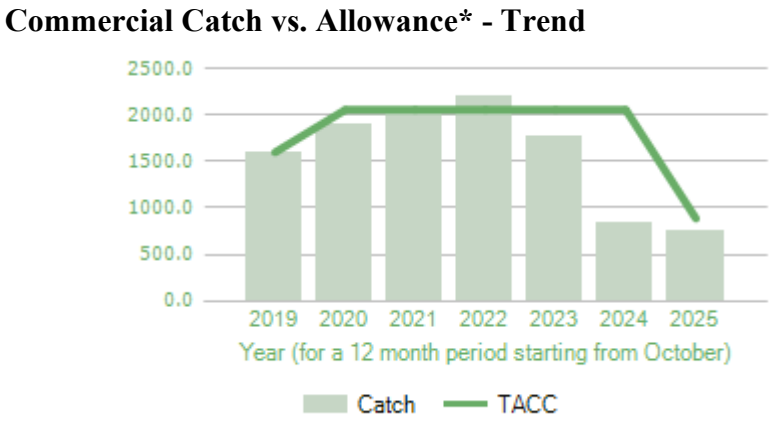

Figure 25 Commercial Catch vs. TACC ORH 7A. Source: Fisheries New Zealand

*All amounts are shown in thousands of kgs.

New Zealand orange roughy is managed under the National Deepwater Fisheries Plan. The plan has 3 parts: Part 1 1- Strategic direction for deepwater fisheries management; Part 2 - Annual operational plan and Part 3 – Annual review report. The last Annual operational plan was from 2023/2024 and the most recent publicly available Annual Review Report was from 2022/2023. Research needs for deepwater fisheries are driven from the Objectives within the National Deepwater Plan 2019 and are primarily delivered through FNZ Fisheries Research Services.

In August 2024, the Medium term research plan (MTRP) for deepwater fisheries was released. The MTRP sets out the research needs to inform management of New Zealand's deepwater fisheries. According to the MTRP, the orange roughy acoustic surveys is scheduled for July 2026 for ORH 3B ES Rise. For ORH 7a, a recent survey was conducted in July 2025 and the next is scheduled for July 2027[3]. Other potential research for orange rough includes: *examining any contamination by swim bladder species when estimating orange roughy acoustic biomass, re-examining the natural mortality and steepness assumptions for each orange roughy assessment, reviewing the assumption of a 5% overrun, representing fish loss from trawl gear damage and ripped nets, for current and recent years, re-evaluating stock structure assumptions and the relationship between maturity and spawning with the potential for age-dependent skipped spawning (*MPI, 2024*)*.

Observer Coverage Summary:

MPI's planned observer coverage for the ORH 3B Chatham Rise and ORH 7A deepwater fisheries as specified in the Annual Operational Plan for Deepwater Fisheries 2022/23, is 290 and 70 days respectively, equivalent to 30% and 50% coverage. According to the Annual Review Report (2024), for the ORH 3B Chatham Rise the achieved observer coverage was 305 days (105% delivered) and for ORH 7A, 79 days were delivered.

"In the deepwater fleet, coverage by observers has averaged around 30% for the past 12 years and risen to 35% for the past 3 fishing years. Over 50% of the catch by the deepwater fleet was observed by a fisheries observer in 2023 -

[3] https://www.mpi.govt.nz/dmsdocument/21746-Medium-Term-Research-Plan-for-Deepwater-Fisheries-Report

2024. A decrease in observer coverage was shown in the inshore and highly migratory fleets since 2022-23 as vessels transition to on-board cameras." (MPI, 2024).

Enforcement Update:

FNZ maintains a comprehensive compliance programme, which includes both encouraging compliance through support and creating effective deterrents. This strategy is underpinned by the VADE model, which focuses on all elements of the compliance spectrum as follows:

1. Voluntary compliance: outcomes are achieved through education, engagement and communicating expectations and obligations.
2. Assisted compliance: reinforces obligations and provides confidence that these are being achieved through monitoring, inspection, responsive actions and feedback loops.
3. Directed compliance: directs behavioural change and may include official sanctions and warnings.
4. Enforced compliance: uses the full extent of the law and recognises that some individuals may deliberately choose to break the law and require formal investigation and prosecution.

As part of DWC's Operational Procedures, DWC has an Environmental Liaison Officer whose role is to liaise with vessel operators, skippers and FNZ to assist with the effective implementation of these Operational Procedures. DWC personnel and vessel operators meet with MPI's Management and Compliance teams annually to discuss and evaluate any issues that may have arisen. Any identified risks are communicated to the fleet along with proposed remedial action to be undertaken.

According to latest ELO report, ELO visited 90% of the fleet in the 2023-24 fishing year[4]. The report provided a summary of Trigger events, VMP/MMOP observer reviews, positive outcomes and a summary of performance and/or issues during the year. Notably, there were no coral triggers in the ORH fishery.

4.3.4. Changes to Personnel

DWC has contracted Dragonfly Ltd to assist in the development of a revised stock assessment approach for orange roughy in ORH 3B ESCR.

4.3.5. Inseparable or practicably inseparable (IPI) stock status

There are no IPI stocks in this fishery.

4.3.6. Total Allowable Catch (TAC) and catch data

Table 13: Allowable Catch (TAC) and catch data ORH3B NWCR

TAC / Catch Data	Year	Amount
TAC	Year 2024-2025	2,321 t
UoA share of TAC	Year 2024-2025	2,321 t
Total catch by UoC (most recent year)	Year 2024-2025	288 t
Total catch by UoC (second most recent year)	Year 2023-2024	237 t

Table 14 Allowable Catch (TAC) and catch data ORH 7A

TAC / Catch Data	Year	Amount
TAC	Year 2025-2026	885 t
UoA share of TAC	Year 2024-2025	885 t
Total catch by UoC (most recent year)	Year 2024-2025	761 t
Total catch by UoC (second most recent year)	Year 2023-2024	846 t

[4] https://deepwatergroup.org/wp-content/uploads/2024/12/FVMS-ELO-Report-2023-24.pdf

4.4. Changes which impact traceability systems

Table 15: Changes affecting traceability and segregation

Are there any developments or changes within the fishery that affect traceability and the ability to segregate MSC from non-MSC products?
NO *If no, sections 4.4.1 - 4.4.3 can be removed.* *Reference(s): FCP 2.3 7.29.15.a.iv*

5. Surveillance Audit Results

5.1. Summary overview

5.1.1. Summary of conditions update

Table 16: Summary of conditions

Condition number	Condition	PI	PI original score	Status	PI revised score
1	By the 4th annual audit in 2026 there will be some quantitative evidence that the partial strategy outlined in the DWG benthic operational procedures is being implemented successfully in the NWCR and ESCR units of assessment.	2.4.2	75	On-target	Not revised

5.1.2. Recommendations (new) – Optional

Principle 1:

Recommendations

- The method of stock assessment differs from that used in the past for assessments of orange roughy – there would be value in assessing its likely performance using simulation. The operating model for such calculations should include variation in recruitment about its expected value as well as structure that leads to variability in age compositions comparable to that observed for New Zealand orange roughy.
- The assessment would benefit from a retrospective analysis (re-running the model leaving out some data points) as well as a historical analysis (the biomass trajectories from past assessments) – these approaches can be used to explore uncertainty in model outputs in addition to conventional methods such as Bayesian posteriors.
- A “bridging analysis” should be included in assessment reports and the report of Plenary to help reviewers understand the primary reasons for changes in stock status. The need for a bridging analysis is most important when major changes have been made to a stock assessment, as is the case for several stock assessments for orange roughy in New Zealand.
- There would be value in an external review of the modelling and the data collection process given the many changes to the stock assessment for orange roughy in New Zealand.

5.2. Re-scoring Performance Indicators

No Performance Indicators were rescored.

5.3. Conditions

5.3.1. Progress against conditions

Table 17: Condition 1 – OPEN

Performance Indicator	2.4.2
Score	75
Justification	From the study by Black (2021), management action would have been triggered in ORH3B NWCR and ESCR, but not in ORH7A. This suggests that pVME has a non-trivial chance of designation as VME in ORH3B NWCR and ESCR, while designation of pVME as VME in ORH7A is unlikely. For potential VME habitat, DWGs operational procedures for BMA indicator taxa encounters have been implemented too recently for there to be quantitative evidence of successful implementation. Therefore, for potential VME habitat in ORH3B NWCR and ESCR, the SG80 is not met and a condition has been assigned.
Condition	By the 4th annual audit in 2026 there will be some quantitative evidence that the partial strategy outlined in the DWG benthic operational procedures is being implemented successfully in the NWCR and ESCR units of assessment.
Condition start	Certification date, August 2022
Condition deadline	4th annual audit, 2026 (month TBD)
Milestones	At the first annual surveillance audit (2023), the client will provide a plan that assures availability of some quantitative metrics capable of demonstrating successful implementation. No change in score is expected. At the second (2024) and third (2025) surveillance audits, the client will provide a report of progress in meeting the condition. No change in score is expected. At the fourth surveillance audit (2026), the client will provide a report with some quantitative metrics capable of demonstrating that the partial strategy has been successfully implemented. Score SG80.
Year 1 Action Plan Expected Output	**Surveillance Audit 1**: DWG will provide a report outlining the processes and analyses undertaken that provide information on the estimated nature and scale of any coral habitat encountered. This report will demonstrate that a plan has been put into effect to ensure tows catching orange roughy in the NWCR and ESCR UoA areas do not pose a risk of serious or irreversible harm to coral habitats.
Progress on Condition (Year 1)	The first milestone for this condition is that the client would provide a plan that assures availability of some quantitative metrics capable of demonstrating successful implementation of the benthic operational procedures. At the time of recertification, DWG's Benthic Operational Procedures had just been implemented (starting 1 October 2021) and are designed to ensure that vessels are cognisant of the requirement to accurately measure, record and report all captures of benthic biota to the Ministry and to their shore managers. DWG's Environmental Liaison Officer is at hand to assist in providing response management advice for implementation in real-time (DWG, 2021b). Orange roughy quota owners had agreed to implement specific benthic interaction measures to closely monitor and minimize catches of live corals within the UoA areas, noting Westpac Bank is excluded from these specific procedures because measures relating to the impact of fishing on benthic biodiversity in this area are managed by SPRFMO. These measures include identifying

	Benthic Management Areas (BMAs) containing extensive aggregations or communities of epibenthic organisms such as corals and sponges, and a “Monitor, Pause, Survey and Assess (MPSA)” management framework, underpinned by a set of “trigger points” that, when reached, require management action. At the time of this first surveillance audit, these encounter protocols had been in place and working for two orange roughy fishing seasons. If coral or sponge bycatch triggers a towline pause, a sample of the coral is sent to a coral expert to determine the species and whether it is alive or dead. If it is verified as dead coral rubble only, the tow is unpaused. Otherwise, it remains paused until video of the area can check whether there is a “VME-like” aggregation of benthic biota in the area. The buffer zones around paused towlines were modified in 2022 to better reflect the real position of the net during the tow. In addition, a coral and sponge identification guide and online quiz for crew has been developed and launched in order to improve identification of benthic biota. To date, four towlines on the Chatham Rise (one in NWCR and three in ESCR) have been paused due to triggering the encounter protocols. This evidence is sufficient to meet the first milestone for this condition.
Year 2 & 3 Action Plan Expected Output	DWG will provide annual progress reports demonstrating that the MPSA strategy is operational and is effective in mitigating the effects of fishing on coral habitats within the UoA areas.
Progress on Condition (Year 2)	The second (and third) milestones for this condition are that at the second and third surveillance audits, the client will provide a report of progress in meeting the condition. From March 2022 to September 2024, the MPSA strategy remained in place, and a total of 4 towlines were paused in the NWCR and ESCR fisheries. A record of trawl tows that yielded trigger-level coral catches is maintained by DWC, along with details on the locality, quantity of coral and the alive/dead status of the coral.
Progress on Condition (Year 3)	Seafood New Zealand – Deepwater has developed operational procedures to outline the management measures for identifying, disposing of, and reporting benthic organisms, including protected corals, captured incidentally during fishing.79 These procedures are approved by the Deepwater Council shareholders and managed by Seafood New Zealand – Deepwater. The management framework includes 10 Commandments for benthic captures, including specific reporting requirements. Vessels must report to the Deepwater Council if trigger points of ≥50 kg of coral catch or ≥600 kg of sponge catch are reached when fishing on a towline. Reports include photos and any relevant information associated with the trigger-level catch. Fishers are instructed to cease fishing in the area (also referred to as ‘paused tows’) until the nature of the benthic catch is identified. Additionally, vessels are required to avoid areas known to have high amounts of benthos. The MPSA strategy remains in place in the NWCR and ESCR fisheries. A record of trawl tows that yielded trigger-level coral catches is maintained by DWC, along with details on the locality, quantity of coral and the alive/dead status of the coral. The following figures were included for the progress update. From September 2024 to September 2025, no towlines were paused in the NWCR and ESCR fisheries. A record of trawl tows that yielded trigger-level coral catches is maintained by DWC, along with details on the locality, quantity of coral and the alive/dead status of the coral. Vessels report trigger-level coral catches, as required in terms of the Trawl Benthic Operational Procedures, and email colour photographs of the captured coral to the ELO. The images are forwarded to coral experts for identification and for determination of their alive or dead status. Trigger level tows with confirmed live coral catch are paused by DWC until further notice.
Progress status	On-Target
Remedial action	N/A

Additional information	N/A

5.4. Client Action Plan

There were no updates to the client action plan.

6. Appendices

6.1. Evaluation processes and techniques

6.1.1. Site visits

The surveillance audit process as defined in the MSC FCP v2.3 7.29 was followed in this audit.

Thirty days prior to the remote audit, on 10th October, 2025, all stakeholders from the full reassessment were informed of the visit and the opportunity to provide information to the auditors in advance of, or during, audit. A list of the stakeholders contacted follows:

Table 18 Stakeholders contacted for this surveillance audit

Name	Organization
Adrian Gutteridge	MSC
Adrian Meder	AMCS
Alfred Schumm	WWF Smart Fishing Initiative
Alison Cross	WWF - US
Andre Kotzikas	United Fisheries Ltd
Andrew Talley	Talleys Group Limited
Andy Smith	Talleys Group Limited
Ann-Marie Copping	
Barry Weeber	Environment and Conservation Organisation of New Zealand (ECO)
Bill Holden	MSC
Carolyn Aguilar	WWF New Zealand
Cat Dorey	AMCS
Cath Wallace	ECO
Crispian Ashby	FRDC
Darryn Shaw	Sanford Ltd
Di Tracey	NIWA
Doub Paulin	Sealord Group Limited
Doug Loder	Talleys Group Limited
Dr. Igor Debski	Department of Conservation
Dr. Jeremy Helson	Seafood NZ
Dr. Malcolm Clark	NIWA
Duncan Currie	DSCC
Edward Abraham	Dragonfly Data Science
Ellie Hooper	Greenpeace
Gary Taylor	Environmental Defence Society
Geoff Keey	Forest and Bird
Geoff Shester	Oceana
Geoff Tingley	Gingerfish
Geoff Tuck	CSIRO
George Clement	Deepwater Group

Ian Angus	Department of Conservation
Jennifer Miller	Forest and Bird
Jenny Black	GNS Science
Jim Cannon	Sustainable Fisheries Partnership
Jo Akroyd	
Karli Thomas	Greenpeace
Karli Thomas	Ocean Advocate
Kate O'Rourke	FishWise
Katrina Subedar	Forest and Bird
Kevin Stokes	
Kylie Grigg	Te Ohu Kaimoana
Kriss Ramm	Department of Conservation
Livia Esterhazy	WWF New Zealand
Maggy Burns	
Matt Watson	MSC
MSC Complaints	MSC
Nathan Reid	Moana New Zealand
Paul Hufflett	
Peer Review College	MSC
Peter Talley	Talleys Group Limited
Richard O'Driscoll	NIWA
Richard Wells	Resourcewise Ltd
Rob Tilney	Deep Water Group
Simon Boag	Atlantis
Simon Brown	MSC
Tiffany Bock	Ministry for Primary Industries
Tim Ryan	CSIRO
Tom Seaman	Undercurrent News
Tony Hazlett	Talleys Group Limited
Vicky Reeve	Ministry for Primary Industries
	Australian Marine Conservation Society (AMCS)
	Bloom Foundation
	Sanford Limited
	WWF Australia
	Greenpeace New Zealand
	Deep Sea Conservation Coalition

Information supplied by the client and management agencies was reviewed by the assessment team ahead of the meetings, and discussions with the client and management agencies centred on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meetings, it was requested by the assessment team and subsequently supplied during, or shortly after the meeting.

Below, we provide the audit plan and the meeting schedule, shared with the client and the participants ahead of the meetings. Results from the meetings are included throughout this report.

Assessment Plan

Fishery Name	New Zealand Orange Roughy
Assessment Type	3rd Surveillance
Unit(s) of Assessment	Species: Orange Roughy (*Hoplostethus atlanticus*) Harvest: method: Demersal trawl UoAs: ORH7A including Westpac Bank; ORH3B Northwest Chatham Rise Geographical area: FAO Area 81 (Pacific, Southwest),
Assessment Date(s)	11 November 2025
Assessment Location(s)	Remote via Teams
Assessment Language	English
Purpose of the Assessment	To conduct a review of the NZ Orange Roughy fishery against the MSC Fisheries Standard for Sustainability v2.01
Assessment Team & Roles	Erin Wilson (TL, P2/P3) Andre Punt (P1) Michealene Corlett (P2/P3)
Team Leader Contact Info	Erin.wilson@mragamericas.com

Microsoft Teams Need help?
Join the meeting now
Meeting ID: 483 116 452 876 1
Passcode: NW6Mf2gQ

Processes To Be Undertaken

Site visit: 11 November 2025
Surveillance Report: 60 days from close of information gathering stage

Date/Time	Activity	Supplemental information/description
11 November 2025	Introductions	• Introduction of the team, their roles, and responsibilities regarding scoring the fishery • Introductions of meeting attendees • Screen shot/sign in sheet for attendance
	Overview of the MSC process	• Where to find more materials Why Get Certified • Timeline
	Applicable Standards	Document — Version number MSC Fisheries Certification Process — **Version 2.3** MSC Fisheries Standard — **Version 2.01** MSC General Certification Requirements — **Version 2.7** MSC Reporting Template — **Version 2.2**

<table>
<tr><td></td><td>Discussion With Client Representatives</td><td>Confirm fishery is in scope (review scope declaration form – FCP v2.3:7.4.5.1)
Principle 1
Principle 2
Principle 3
Status of Conditions (see appendix)
Information requested prior to site visit
Changes to the UoA and its management.
Any potential changes to scientific information, including stock assessments.
Catch data.
Updates on research into fishery impacts on habitats or ecosystems.
Any potential or actual changes in monitoring, reporting, etc.
Performance in relation to any relevant conditions of the certification.
Any developments or changes within the UoA that affect traceability and the ability to segregate MSC from non-MSC products.
Any changes in personnel relevant to science, management, or industry.</td></tr>
<tr><td></td><td>Traceability Requirements</td><td>Documentation is required to confirm client maintains appropriate records to demonstrate traceability back to the UoC.</td></tr>
<tr><td></td><td>Meetings with Others for this Assessment</td><td><table>
<tr><th>Time (NZDT)</th><th>Time (PST – Seattle)</th><th>Session</th><th>Participants</th></tr>
<tr><td>12:45 – 1:30 PM</td><td>3:45 – 4:30 PM</td><td>Opening Meeting</td><td>E. Wilson, A. Punt, M. Corlett, T. Patil, A. Irving</td></tr>
<tr><td>1:30 – 2:30 PM</td><td>4:30 – 5:30 PM</td><td>Principle 1</td><td>E. Wilson, A. Punt, M. Corlett, M. Dunn, G. Tingley, T. Patil, A. Irving</td></tr>
<tr><td>2:30 – 3:00 PM</td><td>5:30 – 6:00 PM</td><td>Principle 2</td><td>E. Wilson, M. Corlett, B. Steele-Mortimer, T. Patil, A. Irving</td></tr>
<tr><td>3:00 – 3:30 PM</td><td>6:00 – 6:30 PM</td><td>Principle 3</td><td>E. Wilson, M. Corlett, J. Andrew, R. Tinkler, T. Patil, A. Irving</td></tr>
</table></td></tr>
<tr><td>TBD</td><td>Assessment Team Discussion</td><td>Review audit findings and other information collected during audit
Agree on audit conclusions (effectiveness of management, coverage of audit scope, findings and critical issues)
Prepare recommendations and audit conclusions (including conditions)</td></tr>
<tr><td>NA</td><td>Closing meeting</td><td>Not necessary. One client meeting is sufficient to discuss this fishery. If there are any major changes in the state of the fishery after the review of information, the assessment team will contact the client group for a follow up conversation.</td></tr>
</table>

6.1.2. Stakeholder participation

A remote surveillance audit was held on 10 November 2025 (the 11th of November NZ time).

6.2. Stakeholder input

MRAG Americas received the following emails (reproduced in its entirety) from Karli Thomas on behalf of the Deep Sea Conservation Coalition. No stakeholder template was submitted, only emails to the assessment team. The assessment team's replies are below both emails (in italics).

Email1:

Kia ora MRAG people,

I understand you are holding the annual surveillance audit for New Zealand's bottom trawled orange roughy fishery this week. I trust you received the letter of concern and the DSCC's submission on the at-or-near collapsed orange roughy ORH3B stock that I shared with Matt from MSC earlier this year? Let me know if not, and I'll pass these on again. The main part of this fishery has been driven to collapse, again, through a failure to learn the lessons of its previous collapse several decades earlier, and the continued reliance on a fishing method - bottom trawling on seamounts and features - that is devastating to orange roughy and to deep sea corals and other ocean life found on these biodiversity hotspots. The timeframe for recovery of ORH3B East & South Chatham Rise (ESCR) fishery is extremely long, and the New Zealand government has failed to adopt the strongest management measure put forth by officials, the closure of the ESCR fishery, which would have reduced the recovery timeframe (though it would still be multi-generational). We have serious concerns for other orange roughy stocks in Aotearoa, some of which remain MSC certified, as previous cuts to catch limits in the main fishery (ORH3B) have been followed by serial depletion of other smaller orange roughy populations. Some of these have never had stock assessments, or have outdated and unreliable assessments completed using the previous (extremely over-optimistic) modeling. Our submission also draws attention to last year's 6-tonne coral bycatch incident in the North West Chatham Rise (NWCR) orange roughy fishery, mainly stony corals. This underwater feature remains open to bottom trawling, and no action has been taken to prevent further such damage. The orange roughy trawled from this area are marketed with the MSC tick of so-called "sustainable" fishing. As you are well aware, this level of coral destruction from trawling on seamounts and features is shocking, but not unprecedented. Every year, tonnes of corals are dragged up in New Zealand's orange roughy bottom trawl nets, and the volume that comes up in the net (including from much smaller bycatch incidents) is only a small fraction of the damage done on the seabed. It is well past time for the MSC to acknowledge that bottom trawling on seamounts and features is inherently unsustainable, and that nowhere in the world does an orange roughy fishery exist that hasn't been mismanaged and overfished. The widespread coral destruction on the Chatham Rise, the loss of spawning aggregations of orange roughy, and the overfishing of the world's largest orange roughy stock while under management certified 'sustainable' by the MSC should be the final signal that these fisheries must be ejected from the MSC certification scheme if it is to retain any shred of credibility.

Ngā mihi nui,

Karli

Email 2:

Please find attached the DSCC's submission on the 2025 government consultation over the Chatham Rise orange roughy ORH3B fishery, and also our submission (made jointly with ECO) to the South Pacific RFMO's Scientific Committee, raising our concerns about the dire state of the world's biggest orange roughy fishery (ORH3B/ESCR) and potential impacts on other orange roughy stocks.

I also recommend you also consider the Government papers, I assume you already have these:

ORH3B 2025 Stock Assessment: *Fisheries New Zealand. 2025b. Orange roughy Chatham Rise and Southern New Zealand (ORH 3B). In Fisheries New Zealand (2025). Fisheries Assessment Plenary, May 2025: stock assessments and stock status. Compiled by the Fisheries Science Team, Fisheries New Zealand, Wellington, New Zealand. 1955 p.*

Fisheries NZ 2025 consultation document on ORH3B: *Fisheries New Zealand. 2025a. Review of sustainability measures for orange roughy (ORH 3B) for 2025/26. Fisheries New Zealand Discussion Paper 2025/24. June 2025.*

Fisheries New Zealand advice to the Minister of Oceans and Fisheries: *Official advice to the Minister including a summary of submissions received. https://www.mpi.govt.nz/dmsdocument/70661-B25-0534-Decisions-for-the-2025-October-sustainability-round-Orange-Roughy*

The Minister's decision announcement on that consultation: *https://www.beehive.govt.nz/release/orange-roughy-blue-cod-catch-limits-reduced*

Some key things of note:

- Despite the very poor status of the ORH3B East and South Chatham Rise fishery (8-18% unfished biomass) this fishery has not been fully closed. The Fisheries New Zealand discussion paper offered this as one of three options presented, and also made it clear that closing this area to all orange roughy fishing would maximise the likelihood of recovering the stock to a sustainable level with an appropriate timeframe. The recovery timeframes are extremely long in any case.

- The government consultation document identifies the still-MSC-certified Northwest Chatham Rise fishery area as the location of the 6-tonne bycatch, mainly stony corals, from December 2024. While the industry claimed this bycatch was the result of the fisher accidentally trawling in the wrong place, the area is not legally closed, therefore there was no legal consequence for the environmental damage and there is also no legal obstacle to trawling in that same area again. Furthermore, there has been no proposal or other move to close this location since the bycatch occured. The site is identified as being an underwater feature, though details of which feature have not been revealed, despite requests under the official information act. I expect the MSC would have a better chance of obtaining the precise location of that bycatch, and following up about the closure of the seabed feature that was damaged in this horrific bycatch event. NGOs routinely have our requests declined when we ask for such information.

- This most recent bycatch event in the MSC-certified NWCR area means that the catch from that destructive trawl will likely have been sold and marketed with the MSC logo. This is very, very far from the standard of fishing MSC portrays itself as endorsing. We also take issue with the galling misrepresentation of the New Zealand orange roughy fishery (which regularly trawls on seamounts and brings up tonnes of corals every year) as having gone "from overfished to outstanding". Some orange roughy stocks are still very much overfished, and a fishery with this level of bycatch of slow-growing deep sea species is the opposite of "outstanding". This article is greenwash at its worst.

- Orange roughy spawning aggregations have also been lost from many of their historical locations, this is particularly apparent in the NWCR (MSC certified) where the only spawning aggregation now occurs on a seamount closed to bottom trawling for more than 2 decades. There is a growing body of evidence that overfishing and repeated trawling of seamount spawning areas is impacting the sustainability of orange roughy populations and their ability to recover from overfishing. The New Zealand fisheries act calls for the protection of "habitats of particular significance to fisheries management" however even those seamounts that are known to be orange roughy spawning areas are not being protected in line with this legal requirement. There is also a failure to extend consideration of "significance to fisheries management" to include managing the environmental impacts of fishing, ie the protection of seamounts and features where corals are being destroyed by bottom trawling.

The Deep Sea Conservation Coalition and its members in allies in Aotearoa New Zealand are calling for an end to bottom trawling on all seamounts and features in Aotearoa and the South Pacific. We consider the MSC's continued endorsement of such a destructive fishery to be a serious obstacle to conservation of corals and other deep sea life, and to the recovery of orange roughy stocks.

We look forward to the day that you cancel this certification in its entirety - it simply can't come soon enough.

Ngā mihi nui,

Karli

Deep Sea Conservation Coalition

Aotearoa ~ New Zealand (GMT+12)

Attachment #1

Submission on Fisheries New Zealand review of sustainability measures for orange roughy (ORH 3B) for 2025/26

30 July 2025
By email to: FMSubmissions@mpi.govt.nz

Table of contents

1. Introduction 1
   a. Deep Sea Conservation Coalition 1
   b. Orange roughy 2
   c. The ORH 3B fishery 2
2. What we are asking the Minister to do 3
3. ORH 3B orange roughy populations and stock assessments 4
4. Management of orange roughy fisheries 6
   a. The Harvest Strategy Standard 6
   b. Ecosystem based management 8
   c. Habitats of particular significance for fisheries management 11
5. Other international agreements relevant to fisheries 12
6. References 13

1. Introduction

a. Deep Sea Conservation Coalition

The Deep Sea Conservation Coalition (DSCC) is an alliance of over 130 organisations globally, working to secure the protection of vulnerable marine ecosystems of the deep sea from destructive practices. DSCC works with a number of member non-government organisations in New Zealand that are also concerned about bottom trawling, including Greenpeace Aotearoa, WWF-New Zealand, Forest and Bird, Legasea, Our Seas Our Future, Endangered Species Foundation and Environment and Conservation Organisations of Aotearoa New Zealand (ECO), itself an umbrella organisation of about 45 groups.

Together, the DSCC and its Aotearoa member groups are seeking an end to deep sea bottom trawling on seamounts and similar deep-sea features by the New Zealand fishing industry. Since May 2019 over 100,000 people have supported our petitions against this destructive and out-dated form of fishing. For those seamounts and features in orange roughy habitat, this would achieve protection of habitat of particular significance for fisheries management' as required under the Fisheries Act 1996.

b. Orange roughy

Orange roughy is a vulnerable species due to its remarkably long lifespan - with individuals living for as long as 245 years, slow growth, late maturity and low fecundity as well as skipped spawning of younger fish. These factors make the species extremely vulnerable to fishing of any sort, and even more so to bottom trawl fishing targeting its spawning aggregations on seamounts and features, habitats that are critically important to orange roughy's life cycle.

In 2022, the North East North Island stock orange roughy assessment revealed that the species reaches full maturity at around 70 years of age, more than twice the 30-40 years previously assumed in models. Stock surveys in 2022 and since have repeatedly observed that spawning aggregations have disappeared from heavily trawled seamounts and other features. This indicates that the species is unable to sustain commercial levels of exploitation due to its unique life-history characteristics, and that bottom trawling, through both short-term disturbance and long-term habitat damage is negatively impacting its lifecycle. This pattern is consistent with global patterns such as the now collapsed (and closed) orange roughy fishery in the North-Atlantic.[1]

c. The ORH 3B fishery

The East and South Chatham Rise (ESCR) is home to the biggest orange roughy population globally, and the main orange roughy fishery both in New Zealand and the world. The fact that such a large fishery has been driven to the point of collapse in the 2020s by just one fishing nation shows an abject failure in fisheries management. It highlights the persistent inability to account for the unique biological characteristics of orange roughy as a deep-sea species and demonstrates that the lessons of the gold-rush years of orange roughy fishing from the 1980s to the early 1990s have not been learned. Inter-generational damage has been inflicted on this fishery. This dire situation has come about through a combination of overfishing, bottom trawling of spawning aggregations and the destruction of their fragile deep-sea habitat, also comprising species with exceptionally long lifespans. Recent commercial catch limit (TACC) increases based on over-optimistic stock assessments have further compounded these impacts.

Currently, the greatest level of concern surrounds the ORH 3B main ESCR fishery, however there are also significant causes for concern about the other fisheries in this broad management area: the Northwest Chatham Rise (NWCR), Sub-Antarctic and Puysegur fisheries. We urge the Minister

[1] Foley, N. et al. (2011)

not to ignore the threats to these smaller stocks. Fisheries New Zealand (FNZ) has not proposed any management adjustments to these fisheries.

2. What we are asking the Minister to do

Protecting orange roughy spawning aggregations is an essential measure to align fisheries management with internationally accepted standards of sustainability. This protection of stocks can be achieved by closing all seamounts and other features in New Zealand waters to bottom trawling, recognising their fundamental role as habitats of particular significance for fisheries management, their high biodiversity value, and their extreme vulnerability to bottom trawling.

The DSCC recommends the following actions to give orange roughy, and the deep sea ecosystem it is part of, the greatest chance of recovery:

- Close all seamounts and features in New Zealand waters to trawling on the basis of their role as habitats of particular significance for fisheries management (e.g. as orange roughy spawning areas), their high biodiversity value and their vulnerability to trawling.
- Close the main ESCR fishery for orange roughy target fishing under a section 11 sustainability measure (in line with option 3) to give the fishery the greatest chance of recovering to a healthy level within the 21st century. This should be done via regulation, not as a voluntary limit, to ensure compliance.
- Until the protection of all seamounts and features from trawling is in place, ensure that the location of the 2024 six-tonne coral bycatch in the NWCR fishery is specifically closed to bottom trawling to prevent further destruction of protected corals. Maintain the existing trawl closure of the Morgue Seamount.
- Direct FNZ to prioritise stock assessments for the Sub-Antarctic and Puysegur fisheries or close these areas, and consult on appropriate management options for those fisheries.
- Inform SPRFMO members of the Chatham Rise ESCR fishery being at or near collapse, and alert them to the potential risk of additional fishing pressure on straddling and high seas stocks, such as Westpac Bank and the Challenger Plateau.
- Adopt an encounter protocol and move-on rule, compatible with the management regime beyond our EEZ in the South Pacific Regional Fisheries Management Organisation (SPRFMO) area, to prevent repeated damage to coral habitats that take centuries to millennia to recover from impact.
- Direct FNZ to update the New Zealand Harvest Strategy Standard and its operational guidelines, and adopt appropriate targets and limits for orange roughy fisheries that are precautionary for a 'very low productivity species'.
- Other sources of mortality caused by fishing should be set at 5% of the total allowable commercial catch (TACC) in orange roughy stock assessment models.
- Roll out of cameras on boats for the deep water bottom trawl sector, in conjunction with increased coverage by fishery observers.

3. ORH 3B orange roughy populations and stock assessments

The 2025 orange roughy stock assessments and the FNZ discussion paper both paint a dire picture of the status of ORH 3B, the major orange roughy bottom trawl fisheries in Aotearoa.

The FNZ discussion paper states, in relation to the ESCR:

15. *The results from these models estimated stock status to be between 8-18 % B_0. Because the Plenary could not determine the most reliable model, all four models were considered by the Plenary to be equally plausible. The Plenary concluded that the stock is very unlikely (<10%) to be above the lower bound of the management target range for orange roughy of 30-50% B_0.*
16. *In relation to the limit reference points set out under the Harvest Strategy Standard (HSS), three of the four models suggest the stock status is between the soft and hard limit, and one model suggests it is below the hard limit. The Plenary in 2025 concluded that the ESCR biomass is likely (>60%) to be below the soft limit of 20% B_0, and unlikely (<40%) to be below the hard limit of 10% B_0.*
17. *The 2025 assessment was informed by work to evaluate stock assessment issues identified in 2023. This included identifying fishing vessel disturbance as a plausible factor influencing orange roughy biomass estimates and CPUE through scaring fish away and fish redistribution (Dunn et al. 2025).*

The Minister is required to act with precaution based on the best available information. Points 15 and 16 of the FNZ discussion paper make it clear that a complete closure of the ESCR fishery is required. 10% of B_0 is generally considered to be the point of fishery collapse, and one of three models indicates the fishery is at that point now, the other three indicate it is declining towards that point. Therefore, closing the fishery is the only responsible option to take.

The FNZ discussion paper states (para 63) regarding the complete closure of the ESCR fishery: "This option maximises the likelihood of ESCR sub-stock orange roughy biomass recovering above the soft limit by removing fishing pressure. But also notes (para 62) that "For the ESCR, under the all recruitment scenario, to reach a 50% probability of achieving 40% B0 under Option 3 would take between 33 to 74 years."

While the status quo is not listed as one of the numbered options in the FNZ discussion paper, it is not clearly ruled out as an option (either in the discussion paper or in media statements) as it was in 2023, despite the status of the orange roughy now being confirmed as even worse. The Ministry states that: (33) "While the current catch settings (the status quo) reflect a large TAC reduction in 2023, these settings may pose a greater risk to the sustainability of ORH 3B and achieving a rebuild than Options 1 – 3."

There is no "may" about this - continuing to fish at the current rate will definitely pose a greater risk to the Chatham Rise orange roughy population. We urge the Ministry not to equivocate on this matter, and to be clear that the status quo is not an option now, as it was not in 2023.

The 2020 ORH3B stock assessments, which showed a rapidly rebuilding fishery at or near the FNZ target band, were subsequently found to be inconsistent with most of the data coming from the fishery and acoustic surveys. The flawed nature of these assessments is another reason why all of the stock assessments for orange roughy fisheries undertaken prior to 2021 should be rejected. That includes the stock assessment for Puysegur.

For the sub-Antarctic fisheries within ORH3B, these have shown rapid deterioration from boom to bust, as well as an overall pattern of sequential fishing effort in new areas followed by collapse (crashing some fishing grounds within four years of trawling). For example, the first sub-Antarctic orange roughy fishery, in southeast Pukaki, went from catches of over 3,000 t in 1995 to under 200 t in 1999, with only a brief revival in fishing since then.[2] In the past, fishing effort has also been pushed into the sub-Antarctic and Puysegur fisheries by overfishing in the Chatham Rise. For example, a MAFF/industry agreement was made in 1991/92 to take 5,000 t of the ORH 3B catch south of 45 degrees,[3] a questionable approach to take pressure off the Chatham Rise without reducing the overall ORH 3B TACC.

DSCC is concerned at the sustainability of other orange roughy fisheries and that effort could be increased on those stocks. Currently ORH 1, ORH 3A, ORH 7A, and the sub-Antarctic and Puysegur parts of the ORH 3B fishery are not constrained by their TACCs or agreed catch limits, and have catches well below that level. These fisheries should be prioritised for stock assessments and TACC and catch limit reviews, including the straddling ORH 7A fishery which occurs partly in international waters within the SPRFMO area. That stock was assessed in 2024, but the most optimistic stock estimate was selected (35% B_0) which relied on survey data more than a decade old. If the most recent (2023) data was included, the model indicated a stock status of 16% B_0, below the soft limit. Catches in ORH 7A halved in the most recent fishing year. SPRFMO should be alerted to this decline, and the possibility that effort displacement from the Chatham Rise fishery could put ORH 7A and the SPRFMO fishery - already in decline - at greater risk.

In the 2025 orange roughy stock assessments the assumed level of 'other sources of mortality caused by fishing' is set very low, under 1%. In fishery modelling there is a general consensus that 5% should be added to reported catch to account for various forms of 'over-runs' both legal and misreported. This includes fish loss due to gear failure, inaccuracy in conversion factors, misreporting, etc. These combined factors are more than just 'fisher reported data' which is the basis for MPI's proposed setting.

[2] Fisheries New Zealand (2009)
[3] Office of the Parliamentary Commissioner for the Environment (1992)

We recommend that 'other sources of mortality caused by fishing' should be set at 5% of the total allowable commercial catch (TACC), as is the general best practice applied to catches in fisheries modeling.

With regard to the stock assessments and TACs, we recommend:

- The ESCR orange roughy fishery is closed through regulatory measures, to allow this population to recover to the target range (which should be higher, see next section) noting this is likely to take multiple decades of no fishing effort.
- In NWCR, the closure of Morgue Seamount is maintained and other seamounts and features are closed to trawling, as well as the location of the 2024 six tonne coral bycatch incident (an approach equivalent to the SPRFMO move-on rule).
- The Sub-Antarctic and Puysegur orange roughy stocks are urgently assessed or closed, given the lack of any recent stock assessment, the historical crash of sub-Antarctic fisheries, and the likely over-optimistic (pre-2021) stock assessment for Puysegur.
- Other sources of mortality caused by fishing should be set at 5% of the total allowable commercial catch (TACC) in orange roughy stock assessment models to align with best practices in fisheries management..
- Inform SPRFMO members of the Chatham Rise ESCR fishery being at or near collapse, and alert them to the potential risk of additional fishing pressure on straddling and high seas stocks, such as Westpac Bank and the Challenger Plateau.

4. Management of orange roughy fisheries

a. The Harvest Strategy Standard

New Zealand's Harvest Strategy Standard (HSS)[4] was published in 2008 - it is well out of date and has never been reviewed. For orange roughy, Fisheries NZ should not be using the default 30-50% B_0 target range, and should instead adopt a higher precautionary target spawning biomass of at least 50% B_0 in recognition of the extreme vulnerability of this species. We note that Australia uses a higher target for orange roughy at 48% or higher.

This would be in line with the Ministry's 2011 operational guidelines to the New Zealand Harvest Strategy Standard[5] which state: "...there are several low productivity New Zealand examples with life history characteristics that are far away from the bounds given in Table 1 for low productivity stocks (e.g. orange roughy and oreos). For such stocks (e.g. stocks with $M < 0.1$ and/or $t_{mat} > 15$), an additional "very low productivity" category needs to be created."

This has not yet been done, and with a new wave of orange roughy population decline and collapse now being recorded, it is an urgent priority.

[4] Ministry for Primary Industries (2008)
[5] Ministry of Fisheries (2011)

We note that Australia's Harvest Strategies have been regularly updated since they were first drafted, and for orange roughy (part of the Harvest Strategy Framework for the Southern and Eastern Scalefish and Shark Fishery)[6] the limit reference point is 20% B_0, at which point the control rule for the fishery specifies: "No targeted fishing; rebuilding strategy will be developed." This is a more precautionary level for such a low productivity species, and we recommend that New Zealand updates its HSS and their operational guidelines, and sets higher, precautionary targets and limits for orange roughy and other very low productivity species.

There are numerous examples of higher management targets for fisheries, for example the target set for kahawai (60% B_0 on the basis of recreational interest) and in CCAMLR stocks (50% B_0 for predator species and 75% B_0 for prey species on the basis of the precautionary approach and ecosystem based management). France uses a 60% B_0 target in toothfish fisheries, while Australia has a default value of 48% B_0 for fisheries and higher values are used in some areas, for example Queensland has a default value of 60% B_0 and Torres Strait fisheries have values of 60-65% B_0. For orange roughy, the Australian Government has agreed a target biomass for the Cascade Plateau of 60% of un-fished spawning levels.[7]

Australia uses a minimum default limit reference point of 20% B_0 while New Zealand has only a soft limit of 20% B_0 and non-precautionary hard limit of 10% B_0. As a result of not having sufficiently precautionary limit reference points in place, among other management factors, several of New Zealand's orange roughy stocks have been fished to below 10% B_0 before fishing was stopped, and a number of orange roughy fisheries in our EEZ have never been reopened or resumed after being fished to collapse (for example ORH 7B in Challenger South[8] and the Southeast Pukaki Rise in ORH 3B sub-Antarctic[9]).

The Seafood New Zealand Deepwater Council has received funding from the Marine Stewardship Council to (among other things) "redesign responsive Harvest Control Rules based management procedure" for orange roughy in New Zealand.[10] Fisheries New Zealand must retain responsibility for updating the New Zealand Harvest Strategy Standard, and setting targets and limits for orange roughy fisheries, and must do so in an open and transparent way engaging all stakeholders - not simply allowing the trawl industry to write its own rules.

With regard to the New Zealand Harvest Strategy Standard, we recommend that:

- As a matter of priority, FNZ updates the New Zealand Harvest Strategy Standard and its operational guidelines, and adopts appropriate targets and limit reference points for orange roughy fisheries that are precautionary for a 'very low productivity species'. This

[6] Australian Fisheries Management Authority (2024)
[7] Australian Fisheries Management Authority (2022)
[8] Fisheries New Zealand (2024): Plenary report ORH 7B
[9] Fisheries New Zealand (2009): Plenary report ORH 3B
[10] Marine Stewardship Council (2024)

approach would account for the species' extreme vulnerability and align with international best practice.

b. Ecosystem based management

New Zealand legislation, international obligations relevant to fisheries management (e.g. the United Nations Fish Stocks Agreement and the SPRFMO convention) and recent court decisions all require ecosystem-based management of New Zealand fisheries.

Seamounts and similar features, such as knolls and hills, are known to be hotspots of deep sea life including ancient and/or fragile species like corals, sponges and sea pens. Many of these species are protected in New Zealand waters under the Wildlife Act, and are considered to be components of vulnerable marine ecosystems (VMEs). This recognition is reflected in frameworks and commitments adopted by bodies to which New Zealand belongs, including SPRFMO, as well as in United Nations General Assembly Resolutions and Convention on Biological Diversity (CBD) recommendations that New Zealand has agreed to. Deep sea corals are known to be both highly vulnerable to bottom trawling, and to have very low resilience, taking decades to even begin to recolonise or regrow after damage done by trawling.[11] These ecosystems have been, and continue to be, adversely impacted by bottom trawling, particularly for orange roughy, and particularly on the Chatham Rise.

A recent study of coral bycatch in New Zealand fisheries found bottom trawling was responsible for 99% of reported bycatch of protected corals for the period 2007/8 to 2019/20, with the orange roughy fishery having the worst impact, accounting for more than half (56%) of the reported catch of protected corals (112.7 tonnes over the reporting period). Stony corals - habitat forming protected species - made up the biggest proportion of coral bycatch, and were "predominantly caught in bottom trawl fisheries targeting orange roughy in the North-East Chatham Rise". Protected coral catch in FMAs 4, 5, and 6 (which approximately align with ORH 3B) accounted for 86% of the total weight of protected coral bycatch within New Zealand waters.[12]

It's also well established that the amount of coral that comes up in a net represents only a very small proportion of the amount that is damaged or destroyed on the seabed (known as 'catchability' where the lower the level of catchability the more that bycatch in the net underestimates damage on the seabed). Trawl nets are not designed to retain coral or other VME taxa so most are crushed beneath or fall out of the net. In SPRFMO, trawl catches of just 30 kg of coral are estimated to correspond to seabed coverage of 65–80% of *Solenosmilia variabilis*. This implies that a single trawl tow likely contacts 3.9–12.5 tonnes of coral biomass, resulting in seabed impacts of 3.2–10.2 tonnes.[13] In other words, for every 30 kg of coral brought up in the net, an estimated 100 to 400 times more coral can be damaged or destroyed on the seabed. Another recent paper reviewing previous catchability estimates and adding new video/trawl comparisons

[11] Clark, M. *et al.* (2019); Clark, M. *et al.* (2022b)
[12] Meyer, S. (2023)
[13] Pitcher, R. *et al.* (2019)

found for most VME taxa less than 4% of what was impacted on the seabed came up in the net as bycatch[14] meaning that seabed damage is orders of magnitude higher than the weight of coral or other taxa brought up in the net as bycatch.

Additionally, reported coral bycatch in New Zealand is largely from those vessels with observers on board; currently between 23 -37% for the deep water bottom trawl fishery over the past decade, according to Department of Conservation CSP Annual Research Summaries. The amount of benthic bycatch reported by fishery observers from the entire trawl fleet (all sectors) in 2022-23 was 6.65 tonnes with around 22% of trawls observed by fishery observers.[15] In contrast, the amount of fisher-reported benthic bycatch over that same period (which should represent all such bycatch from 100% of trawl vessels) was only 6.56 tonnes:[16] Less than 90 kilograms difference. It's implausible that 78% of trawls had only 90 kilograms of benthic bycatch, suggesting there is significant under-estimation of bycatch weight, under-reporting of bycatch and/or failure to report some incidents when fishery observers are not present.

New Zealand is thought to be home to at least 196 endemic coral species,[17] though new discoveries are being made every year. Recent discoveries have come from a range of sources: biological sampling, benthic bycatch, identifications from existing collections, and through genetic analysis of certain "species" revealing they are in fact a number of separate species (known as "cryptic species" - such as the recent discovery of five different genera of black coral previously considered to be a single species).[18]

Many coral species are found on seamounts and similar features, which provide a hard substrate on which they can grow. There are currently 1,996 seamounts, knolls and hills in New Zealand waters recorded in the SEAMOUNT database, the 2022 update noted: *"Most practising ecological researchers in the seamount-UTF space reject broad and generic cut-off points in elevation and naming conventions as not being ecologically relevant. Small features share many of the environmental characteristics of larger features, with similar ecological dynamics, and the size distribution of such elevations are continuous".*[19]

Ecosystem-based management and adopted UNGA bottom fisheries resolutions require that the habitats and ecosystems associated with or impacted by bottom trawling are also considered when managing a fishery like orange roughy. Given the current knowledge and existing limitations to knowledge of seabed ecosystems throughout the New Zealand EEZ, the protection of these species and ecosystems that are associated with and impacted by the orange roughy fishery requires two measures:

- the protection of all seamounts and similar features, and

[14] Stephenson, F. *et al.* (2022)
[15] McGovern, H. and Hewetson, E. (2025)
[16] Fisheries New Zealand (2025)
[17] Tracey, D. and Hjorvarsdottir, F. (eds) (2019)
[18] Bilewitch, J. and Tracey, D. (2020)
[19] Clark, M. *et al.* (2022a)

- the adoption of an encounter protocol and move-on rule, enabling a precautionary response to bycatch of coral and other vulnerable deep-sea species.

Rather than doing so, FNZ's discussion paper takes an extremely reductive approach to considering different components of the ecosystem; for example, stating that "Bottom trawling is unlikely to have an adverse effect on the characteristics of the water column attributes that are critical for orange roughy spawning" and "There is no available evidence on the potential role of biogenic habitats such as corals and sponges influencing where orange roughy spawn."

However, existing best available science indicates that these different components of the ecosystem, and conditions conducive to orange roughy spawning aggregations, are linked. Repeated stock surveys are no longer finding orange roughy spawning aggregations on heavily trawled sites including seamounts and features (e.g. in ORH 3B, ORH 7A and ORH 2A) and scientists suggest that the disturbance from bottom trawling is interfering with the formation of spawning aggregations. As described in the 2025 ORH 3B Plenary Report: "The latter [method for estimating orange roughy productivity] assumed a change point in 1980, which was supported by likelihood profiles of the change year, and by the investigations of potential influence of fishing disturbance on spawning (Dunn et al 2025)."[20]

In November 2022 the High Court provided clarification on the Minister's responsibilities in terms of setting the TAC. Churchman J. described those responsibilities (in part) as follows: "When setting or varying [the] TAC the Minister must take into account any effects of fishing on any stock and the aquatic environment. 'Effect' means the direct or indirect effect of fishing, including any positive, adverse, temporary, permanent, past, present, future, and/or cumulative effect. 'Fishing' means the catching, taking, or harvesting of fish, aquatic life, or seaweed". The judgement applies to all species in the quota management system (QMS) and their habitats, not just the fish stocks of value to commercial interests.

The DSCC recommends an ecosystem approach applied to orange roughy fisheries, including by:

- The closure of all seamounts and similar features to trawling, to protect corals and other vulnerable deep-sea habitats found there, and to prevent the disturbance and loss or orange roughy spawning aggregations.
- The adoption of an encounter protocol and move-on rule, enabling a precautionary response to bycatch of coral and other vulnerable deep-sea species similar to that in place within the SPRFMO area.
- Roll out of cameras on boats for the deep water bottom trawl, in conjunction with increased coverage by fishery observers (currently between 23 -37% for the deep water bottom trawl fishery over the past decade, but 100% for trawlers operating in the SPRFMO area).

[20] Fisheries New Zealand (2025b): Plenary report ORH 3B

c. *Habitats of particular significance for fisheries management*

In addition to the requirement for ecosystem based management, and consideration of associated and dependent species, the Fisheries Act 1996 also requires protection of habitats of particular significance for fisheries management (HPSFM).

Stock surveys are repeatedly finding that orange roughy spawning aggregations are missing from heavily trawled features - in 2022 on the North Island East Coast (Strawberry Mountain and Ritchie Banks were historical spawning areas but aggregations have not been found in recent surveys), in 2023 on the Chatham Rise (*"the main spawning aggregation now occurs on the Morgue hill which was closed to bottom fishing in 2001, rather than the Graveyard hill which remains open to fishing."*)[21] and in 2024 for ORH 7A (spawning aggregations not found in historical areas, or in-zone, aggregation found on the difficult to trawl and recently un-trawled Volcano feature).

Fisheries New Zealand has repeatedly failed to formalise the classification of seamounts and features, and other known locations of spawning aggregations, as habitats of particular significance to fisheries management. These need to be formally designated, and protected by closing them to trawling.

The introductory chapter on orange roughy in the May 2025 Plenary Report outlines the best available information as well as the lack of information on seamounts and features as HPSFM:

"Fishing during spawning may disrupt spawning activity or success. There is no research on the disruption of spawning orange roughy by fishing in New Zealand. Some orange roughy spawning aggregations were historically abundant but depleted by fishing, predominantly during the 1980s and 1990s, and no longer seem to occur. This includes the large aggregations on Strawberry Mountain in the Mid-East Coast stock, and on Central Flats in the Challenger stock. On Chatham Rise, the main spawning aggregation no longer occurs at the Old Spawning Plume but at Rekohu, and spawning aggregations occur on the Morgue Hill but no longer the Graveyard Hill. The relationship between different spawning aggregations within the same assumed stock, and the implications of the loss of spawning aggregations for orange roughy and the wider ecosystem, is unknown."[22]

In the absence of certainty, decisions must be made on a precautionary basis. Furthermore, to have regard to the cumulative and future effects of fishing requires that the Minister must be informed of past effects and of future risks. The latest and previous stock stock surveys, indicating spawning aggregations are no longer found in historical orange roughy spawning areas, signals a serious future risk of continued fishing. A fish population lacking undisturbed spawning grounds and no longer achieving traditional spawning success is a population in trouble. This outcome does not meet the environmental bottom line requirement of the Minister. The current situation also underlines the critical need to maintain the closure of Morgue seamount, and to close other

[21] Fisheries New Zealand (2023)
[22] Fisheries New Zealand (2025b)

seamounts and similar features to trawling, allowing their ecosystems to recover and providing undisturbed spawning areas for orange roughy and other fish species. A decision to do so would represent ecosystem-based management, achieve protection of HPSFM and would be in line with the Fisheries Act, UNGA Resolutions and FAO Code of Conduct for Responsible Fisheries.

5. International obligations relating to fishing

In addition to the Fisheries Act obligation to protect habitats of particular significance for fisheries management, the UN Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fisheries Article 6.8 calls for protection and rehabilitation of critical fisheries habitats, including spawning areas (which for orange roughy, include seamounts and features):

"All critical fisheries habitats in marine and fresh water ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary. Particular effort should be made to protect such habitats from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources."[23]

- Protection of critical habitats is required under both the Fisheries Act and FAO Code of Conduct for Responsible Fisheries.
- The precautionary principle and ecosystem approach are required under multiple international and regional agreements as well as the Fisheries Act.
- The recommendations outlined in this submission would be in line with New Zealand's international obligations relating to fishing.

[23] FAO (2011)

6. References

Anderson, O., Schnabel, K., Bowden, D., Davey, N. and Hart, A. (2023) Identification of protected coral hotspots using species distribution modelling. Report prepared for Project POP2021-02, Conservation Services Programme, Department of Conservation. August 2023.

Anderson, O. and Clark, M. (2003) Analysis of bycatch in the fishery for orange roughy, *Hoplostethus atlanticus*, on the South Tasman Rise. Marine and Freshwater Research 54(5):643-652

Australian Fisheries Management Authority (2024) Harvest Strategy Framework For the Southern and Eastern Scalefish and Shark Fishery. 2009 (Amended 2024)

Australian Fisheries Management Authority (2022) Orange Roughy (*Hoplostethus atlanticus*) Stock Rebuilding Strategy 2022.

Bilewitch, J.P. and Tracey, D. 2020. Protected coral connectivity in New Zealand. Final Report for project POP2018-06 prepared by NIWA for the Conservation Services Programme, Department of Conservation. DOC19306-POP201806.

Clark, M., Wood, B., Mackay, K., Anderson, O., Hart, A., Rickard, G. and Rowden, A. (2022) Underwater Topographic Features in the New Zealand region: development of an updated 'SEAMOUNT' database and information on the extent and intensity of deep-sea trawl fisheries on them. New Zealand Aquatic Environment and Biodiversity Report No. 291. September 2022.

Clark, M.R.; Bowden, D.A.; Stewart, R.; Rowden, A.A.; Goode, S.L. (2022). Seamount recovery: analysis of 20 years of time-series data from the Graveyard Knolls, Chatham Rise, New Zealand. New Zealand Aquatic Environment and Biodiversity Report No. 292.

Clark, M. R.; Bowden, D. A.; Rowden, A. A. and Stewart, R. (2019) Little Evidence of Benthic Community Resilience to Bottom Trawling on Seamounts After 15 Years. Frontiers in Marine Science.

Clark, M. R. and Bowden, D. A. (2015) Seamount biodiversity: high variability both within and between seamounts in the Ross Sea region of Antarctica. Biology of the Ross Sea. Volume 761, pages 161–180, (2015)

Emery, T. (2020) Status of Australian Fish Stocks Report: Orange Roughy. Australian Bureau of Agricultural and Resource Economics and Sciences.

Environmental Law Initiative v Minister for Oceans and Fisheries (2022) NZHC 2969. 11 Nov 2022. High Court judgment decision for Northland rock lobster.

Escobar-Flores, P.C.; Maurice, A. (2024) Estimation of the abundance of orange roughy on the southwest Challenger Plateau (ORH 7A including Westpac Bank). New Zealand Fisheries Assessment Report 2024/26.

Fisheries New Zealand (2025) Fisheries Assessment Plenary, May 2025. Stock Assessments and Stock Status, Vol 2. Orange Roughy Challenger Plateau (ORH 3B).

Goode, S.L., Rowden, A.A., Clark, M.R., Bowden, D.A. and Stephenson, F. (2025) Early signs of recovery suggested by changes in the structure and function of deep-sea megabenthic communities on a seamount 19 years after fishing. Deep Sea Research Part I: Oceanographic Research Papers. Vol 220, June 2025

Fisheries New Zealand (2025) Review of sustainability measures for orange roughy (ORH 3B) for 2025/26. Fisheries New Zealand Discussion Paper 2025/24. June 2025.

Fisheries New Zealand (2025b) Fisheries Assessment Plenary, May 2025. Stock Assessments and Stock Status, Vol 2. Orange roughy Chatham Rise and Southern New Zealand (ORH 3B).

Fisheries New Zealand (2025c) Non-fish and Protected Species caught by commercial fishers. Excel spreadsheet downloaded March 2025 from MPI website here.

Fisheries New Zealand (2024) Fisheries Assessment Plenary, May 2024. Stock Assessments and Stock Status, Vol 2. Orange Roughy Challenger Plateau (ORH 7A).

Fisheries New Zealand (2023) Fisheries Assessment Plenary, May 2023. Stock Assessments and Stock Status, Vol 2. Orange Roughy, Chatham Rise and Southern New Zealand (ORH 3B).

Fisheries New Zealand (2022) Fisheries Assessment Plenary, May 2022. Stock Assessments and Stock Status, Vol 2. Orange Roughy, Cape Runaway to Banks Peninsula (ORH 2A, 2B, 3A).

Fisheries New Zealand (2009) Fisheries Assessment Plenary, May 2009. Stock Assessments and Stock Status, Vol 2. Orange Roughy, Chatham Rise and Southern New Zealand (ORH 3B).

Foley, N.S., van Rensburg, T.M. and Armstrong, C.W. (2011) The rise and fall of the Irish orange roughy fishery: An economic analysis. Marine Policy Vol 35 (6). https://doi.org/10.1016/j.marpol.2011.01.003

Food and Agriculture Organization of the United Nations (2011) Code of Conduct for Responsible Fisheries. FAO, Rome, Italy.

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. New Zealand Fisheries Assessment Report 2019/29.

Marine Stewardship Council (2024) Age structured production model and Harvest Control Rules for New Zealand orange roughy. Announcement of a £49,885
Transition Assistance Fund.

McGovern, H. and Hewetson, E. (2025) Conservation Services Programme Annual Research Summary 2022-23. Department of Conservation.

Meyer, S. (2023). Report - Final results: INT2021-02 Characterisation of protected coral interactions. Report for the Department of Conservation by Proteus.

Ministry for Primary Industries (2008) Harvest Strategy Standard for New Zealand Fisheries. October 2008.

Ministry of Fisheries (2011) Operational Guidelines for New Zealand's Harvest Strategy Standard. Revision 1, June 2011.

Office of the Parliamentary Commissioner for the Environment (1992) Sustainable management of the Chatham Rise orange roughy fishery.

Pitcher, R., Williams, A. and Georgeson, L. (2019) Progress with investigating uncertainty in the habitat suitability model predictions and VME indicator taxa thresholds underpinning CMM 03-2019. SC7-DW21_rev1 submitted to SPRFMO 7th Scientific Committee by Australia.

South Pacific Regional Fisheries Management Organisation (2023) Conservation and Management Measure for the Management of Bottom Fishing in the SPRFMO Convention Area. CMM 03-2023.

South Pacific Regional Fisheries Management Organisation (2019) 7th Annual Meeting of the Commission Meeting Report 23-27 January 2019, The Hague, The Netherlands.

South Pacific Regional Fisheries Management Organisation (2015) Convention on the Conservation and Management of High Seas Fishery Resources of the South Pacific Ocean

Stephenson, F., Geange, S., Rowden, A., Charsley, A., Anderson, O. and Biggerstaff, A. (2022) Further analysis of the catchability of VME indicator taxa and the design of a related research programme. SPRFMO SC paper SC10-DW04.

Tracey, D.M. and Hjorvarsdottir, F. (eds, comps) (2019) The State of Knowledge of Deep-Sea Corals in the New Zealand Region. NIWA Science and Technology Series Number 84.

United Nations (1995) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA)

Attachment #2

South Pacific Regional Fisheries Management Organisation

13th Meeting of the Scientific Committee

Wellington, New Zealand, 8 September - 13 September 2025

New Zealand orange roughy: Implications for SPRFMO deepwater stocks

Observer Paper

Deep Sea Conservation Coalition and ECO

9 August 2025

1

New Zealand orange roughy: Implications for SPRFMO deepwater stocks

Contents

1. Abstract....2
2. Introduction....3
3. International experience....4
4. The 2025 stock assessment for orange roughy ORH 3B....5
5. New Zealand fisheries management has implications for SPRFMO....6
6. Immediate priorities for SPRFMO....7
7. Recommendations to SPRFMO SC....8
8. References....9

1. Abstract

Next year, the SPRFMO Commission is scheduled to review CMM 03a-2025, including setting new catch limits for orange roughy and other deepwater species. Other than for orange roughy on Westpac Bank, which was assessed in 2024 and reviewed by SC12 to inform the reduction agreed at Comm13, there are no recent stock assessments available. If no papers are submitted to SC13 on which to develop recommendations for the Commission, the SC should look to the best available sources of information to develop advice consistent with the precautionary approach and the ecosystem approach (Article 3 of the Convention).

For orange roughy, the most recent information on population status comes from NZ's Chatham Rise, where the world's largest orange roughy fishery, East and South Chatham Rise (ESCR) has been assessed this year, along with several smaller fisheries within the New Zealand management unit ORH 3B. The ESCR stock is estimated to be between 8 - 18% of unfished biomass (B_0) meaning it is at, or near, the point of collapse. By the SC13 meeting the New Zealand government will likely have made a decision on whether or not to close this fishery or set a reduced catch limit (Fisheries New Zealand (FNZ) 2025).

For other deepwater species such as alfonsino, oreos and cardinalfish, precautionary catch limits have not been set by the Commission (para 11, CMM 03a-2025). None of these species have had stock assessments in the SPRFMO area and current catch limits are still set for combined multiple species and stocks, as *"all other target and non-target fish species in the Evaluated Area"* based on the combined average annual total catch between 1 January 2002 to 31 December 2006. Recent catches are low, and not constrained by that catch limit.

In light of these factors, the 2026 review of CMM 03a the SC should recommend precautionary catch limits with a clear workplan to address information deficiencies for orange roughy and other deepwater species caught in the convention area.

2. Introduction

Orange roughy is an extremely long-lived deep sea species, with maximum ages of well over two centuries recorded in SPRFMO and adjacent waters (Horn and Ó Maolagáin, 2019). It has low productivity, with maturity starting around 25-30 years. However orange roughy is known not to spawn every year and it is probable that younger mature fish, in particular, do not spawn every year.

As Clark noted more than two decades ago, deepwater exploited species have *"slow growth rates and high longevity compared to traditional commercial species from the continental shelf. They have low levels of sustainable yields, are vulnerable to overfishing, and have slow recovery rates."* Further, there was uncertainty about *"how resilient and sustainable these fisheries may be in the long term"* (Clark 2001). These are reminders of the questions that still face orange roughy fisheries managers today.

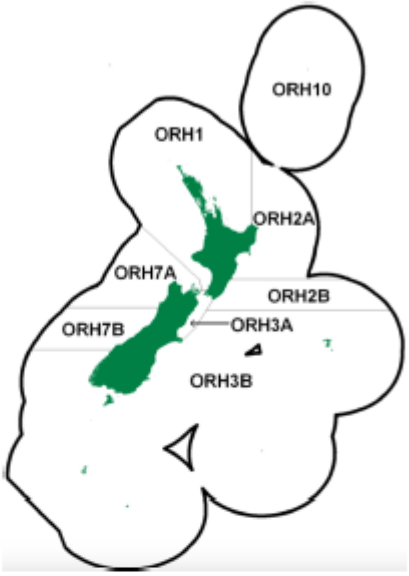

Figure 1: New Zealand orange roughy management areas (from Fisheries New Zealand)

New Zealand is likely home to the world's largest population of orange roughy, on the Chatham Rise (ORH 3B - see figure 1). This fishery started in the late 1970s and peaked in the mid to late 1980s at over 32,000 tonnes. The fishery saw a sharp decline through the 1990s down to 9,000 tonnes reported caught. This led to fishing in other areas of ORH3B including sub-Antarctic areas. The past 25 years have seen two periods of catch increases for the ORH 3B fishery, (with catch limits around ⅓ of their peak level, reducing to around 20%). Each of these has resulted in a further decline within a decade. The catch in 2023/24 was the second lowest in the history of the fishery, and only 43% of the catch limit.

The consistent pattern observed in orange roughy fisheries in New Zealand and globally has been discovery of fish, followed by a large increase in trawl effort and then rapid decline and often collapse of fisheries focused on spawning aggregations. The serial depletion of fisheries on seamounts and other features has been well described for the ESCR and for sub-Antarctic features (e.g. Clark 1999, Tingley and Dunn 2018, Dunn 2024). Smaller orange roughy populations located on a single feature (for example Pukaki Rise and near the Auckland Islands and Bounty Islands) all showed a rapid decline in catch rates and catches and fisheries ceased

within a matter of years (FNZ 2025b). All indications are that these small feature-based orange roughy populations simply cannot sustain catches.

Both New Zealand's ORH 7A (which includes the Westpac Bank in SPRFMO area) and ORH 7B (West Coast South Island) fisheries have shown similar declines. ORH 7B was closed in 2007 and has not been re-opened.

The large declines and loss of spawning aggregations in orange roughy fisheries has been reported in several New Zealand fisheries. Fisheries New Zealand (2025c) reports the loss of large spawning aggregations in the Mid-East Coast stock (ORH 2B), Central flats in ORH 7A and from Graveyard Hill in Northwest Chatham Rise (ORH 3B). The implications of the loss of spawning aggregations are not known but is clearly a matter to be considered when applying the precautionary and ecosystem approach to orange roughy fisheries.

New Zealand's 2024 stock assessment of the Challenger and Westpac Bank fishery (Dunn, 2024b) was presented to SC12. The paper noted that no aggregations of spawning fish were found in historical spawning sites on the central flats or other areas within the New Zealand EEZ and that the only spawning aggregation was found on the feature "Volcano" in the SPRFMO area.

The disappearance of orange roughy spawning aggregations from Graveyard Hill, a historical spawning site, was noted again in the 2025 ORH 3B stock assessment (Dunn 2024b). The only spawning aggregations observed in the NWCR fishery in recent surveys have been on a seamount that is closed to trawling. Fisheries New Zealand (2025b) notes: "the main spawning aggregation now occurs on the Morgue hill which was closed to bottom fishing in 2001, rather than the Graveyard hill which remains open to fishing.

3. International experience

Globally, many orange roughy fisheries have been closed by fisheries management authorities not long after they started. In addition to New Zealand, orange roughy fisheries have been closed including in Chile, the northeast Atlantic, Australia, and Namibia. The fisheries in the NE Atlantic and Chile have been closed for many years (Tingley and Dunn 2018). The South East Atlantic Fisheries Organisation (SEAFO) limits orange roughy catches in the high seas to a 50 tonne exploratory catch limit. The Southern Indian Ocean Fishery Agreement (SIOFA) still has an orange roughy fishery but it is much reduced from past years. The Tasman Rise fishery was closed prior to the establishment of SPRFMO and remains closed.

There are many lessons from the current state of fisheries and knowledge of orange roughy from New Zealand and beyond. Even after forty years of fishing, many unknowns remain about orange roughy, including their real natural mortality, age at maturity, whether they spawn annually or not, and the impact of the loss of key spawning aggregations on ecosystems and recruitment. It is well-reported by skippers that trawling on spawning aggregations disturbs the

formation and location of aggregations. The impact of this on spawning success or future recruitment is not known but recruitment is a key uncertainty in orange roughy fisheries. What is less understood is the relationship between habitat degradation of spawning sites (most commonly on seamounts and other features) and the continuation or loss of spawning aggregations at those sites. However, it is known that bottom trawling causes fundamental and long-lasting damage or loss of benthic species and vulnerable marine ecosystems found at those locations.

4. The 2025 stock assessment for orange roughy ORH 3B

The New Zealand ORH 3B fisheries were assessed in 2025, after concerns were raised in a previous, inconclusive stock assessment in 2023 (Dunn 2024a).

- The main fishery, ESCR (which makes up around half of ORH 3B catches) was estimated to be at 8-18% of unfished biomass (B_0).
- The 2023 investigation into this stock was inconclusive and resulted in the previous stock assessment being invalidated and the fishery self-suspended from Marine Stewardship Council (MSC) certification from 20 December 2023 (MSC 2023).
- Prior to that, an over-optimistic stock assessment had suggested the stock was recovering, leading to the catch limit being increased three times between 2018 and 2020 - from 5,197 tonnes to 7,967 tonnes.
- The smaller NWCR fishery is at the lower end of the FNZ target range, at 34-36% B_0. However, its spawning aggregations have recently only been found on one seamount (Morgue) which has been closed to trawling since 2001 (FNZ 2025b, Clark 2010).
- The Puysegur fishery or stock has not been assessed since 2017 and its assessment is likely to be *"overly optimistic"* as its uses *"the same model structure and range of assumptions as the 2020 ESCR stock assessment which was subsequently rejected by the [FNZ fisheries] plenary in 2023"* (FNZ 2025b).
- The sub-Antarctic fisheries have never had full stock assessments, but all have seen a rapid decline in catch of any feature fished, e.g. southeast Pukaki, where the fishery started at 3,010 t and rapidly declined and ceased in four years (FNZ 2025b).

Fisheries New Zealand consulted on 2025/26 total allowable catch for the ORH 3B fishery in June-July 2025 (FNZ 2025a). The FNZ discussion document included three options ranging from a 23% to a 60% cut in the catch limit. The largest reduction (option 3) would close the ESCR fishery, which assumes the remaining ORH3B catch could be taken from the NWCR, Puysegur, and Sub-Antarctic fisheries. The FNZ discussion paper noted the largest reduction (ESCR closure) "*provides the greatest certainty of rebuilding given the risk that recruitment may remain very low.*"

The timeframe for recovery to 40% B_0 (the midpoint of the FNZ target range) is long, even if the ESCR fishery is closed from 2025/26. In models using "all-recruitment" (since 1911), the stock will slowly rebuild in the absence of fishing over 33 – 74 years. However, if the model uses recent recruitment (since 1980), recruitment is estimated to remain low, and the stock will not rebuild over the 100 year period assessed in the four models used for projections.

A decision on this matter must be made before 1 October 2025 and is expected prior to the SPRFMO SC13 meeting.

5. New Zealand fisheries management has implications for SPRFMO

The stark lesson from orange roughy fisheries globally is that additional caution is needed in managing long-lived low productivity species, particularly where life-history traits of the species are uncertain.

The orange roughy straddling stock in the Tasman Sea (Westpac Bank and New Zealand's ORH 7A fishery) was assessed in 2024 (Dunn 2024b). No spawning aggregations were found in-zone where they have historically occurred, the only aggregation observed was on the Volcano feature on Westpac Bank in the SPRFMO area, an area that hadn't been fished for two years when surveyed in 2023. All three models used in the 2024 ORH 7A assessment indicated that the stock had been declining since 2015. The selected base case (All2) contained no new biomass data since 2013, and indicated the stock was just above 30% B_0 while the assessment that used all the acoustic data (All6), including from the most recent 2023 survey, indicated that the stock had a 71% probability of being under 20% B_0 and was moving towards 10% B_0 (Dunn 2024b).

The 2024 ORH 7A assessment also showed that the fisheries footprint increased as the stock declined in two periods, firstly before the fishery was closed in 2000 and secondly after 2015 as the stock declined again. *"The overall fishing footprint increased again from 2015 and by 2023 reached a level similar to that in the late 1990s, although the footprint after 2015 included areas new to the fishery"* (Dunn 2024b). The unstandardised catch rates (t/tow) have shown similar trends. The expansion in fisheries footprint and likely associated benthic impact of the fishery, as stocks decline again, is one that SPRFMO should be aware of and address in the SPRFMO area.

The ORH 7A catch limit was reduced from 2,058 tonnes to 885 tonnes in the most recent fishing year (2024/25). The new catch limit is close to the previous year (2023/24) catch (846 tonnes) and would not allow the stock to rebuild if the All6 assessment is correct.

In the NWCR, one seamount closed to trawling is most likely now supporting the reproduction of the stock after spawning aggregations have disappeared from historical areas that have been, and still are, open to bottom trawling This is further evidence of the need to protect orange roughy spawning sites, such as Volcano on the Westpac Bank, from being impacted by trawling.

In late 2024 on the NWCR one orange roughy bottom trawl event brought up six tonnes of bycatch, including stony corals (FNZ 2025a) demonstrating the significant adverse impacts that bottom trawling has on vulnerable marine ecosystems (VMEs). For SPRFMO, this underscores the need to fully implement relevant UNGA resolutions and other commitments to protect biodiversity from significant adverse impacts from fishing, including closing known VMEs to bottom fishing in line with CMM 03-2025.

Another issue for SPRFMO SC to consider is whether reductions in New Zealand's in-zone catch limits could displace effort into fisheries that have not been assessed by SPRFMO, such as alfonsino or oreos - both now considered long-lived species. Recent research on alfonsino from the Indian Ocean using otolith bomb carbon to estimate fish ages indicates alfonsino is much older than previously thought (even from a small sample, the maximum age was found to be at least 50 years old rather than a maximum of 20 years as previously thought) (Andrews 2023).

In the SPRFMO area these non-orange roughy deepwater stocks are not constrained by current catch limits, and catch limits are not even set for individual species or stocks (Para 11 and table 3 of Para 11 and table 3 of CMM 03a-2025).

6. Immediate priorities for SPRFMO

The SPRFMO Scientific Committee has an obligation to provide advice and recommendations to the Commission on catch limits, management strategies or plans for fisheries resources. The Commission must determine catch limits for most orange roughy fisheries at its next meeting. Paragraph 35 of CMM 03a-2025 states: *"Notwithstanding that the Commission may alter the catch limits prescribed in paragraphs 6, 8 and 10, this CMM shall be reviewed no later than the annual meeting of the Commission in 2026."*

The current catch limits for the SPRFMO orange roughy fisheries (with the exception of Westpac Bank) expire at the end of 2025, so stock assessments should have been carried out in 2025, and presented to SC13 to inform new catch limits. We are not aware of any such assessments. If orange roughy catches in the SPRFMO area are to continue, new catch limits need to be agreed at Comm14 in 2026.

The SPRFMO convention (Article 3.2) is clear that the Scientific Committee *"shall:*
(i) be more cautious when information is uncertain, unreliable or inadequate;
(ii) not use the absence of adequate scientific information as a reason for postponing or failing to take conservation and management measures; and
(iii) take account of best international practices regarding the application of the precautionary approach, including Annex II of the 1995 Agreement and the code of conduct".

In 2026 SPRFMO will be reviewing CMM 03a-2025, likely in the absence of new stock assessments. SC13 must ensure that the Commission is nevertheless aware of the best available information, including the status of New Zealand's main orange roughy fishery (at or near collapse), the disappearance of spawning aggregations from numerous historical spawning sites and recent instances of significant adverse impacts when bottom fishing occurs on VMEs.

In light of these factors, extreme caution is required in the setting of catch limits for orange roughy and other deepwater species in the SPRFMO area, and SPRFMO must prevent significant adverse impacts on VMEs from those fisheries.

7. Recommendations to SPRFMO SC

Noting the status of New Zealand's main orange roughy fishery, and the implications and lessons this has for SPRFMO's deepwater fisheries, DSCC recommends that SC:

1. Recommends to the Commission **new precautionary catch limits for orange roughy fisheries.**
2. Recommends to the Commission that **the feature "Volcano" on the Westpac Bank be closed to bottom fishing** as the only observed spawning aggregation for this straddling orange roughy stock.
3. Develops advice for the Commission on **precautionary catch limits for other deepwater species** caught in the SPRFMO area.

8. References

Andrews, A.H. 2023. Age, growth, and lifespan investigations of Splendid Alfonsino (*Beryx splendens*) of the Indian Ocean using bomb radiocarbon dating. Project Code: SER2022-BYS2 for SIOFA.

Clark, M.R. 1999. Fisheries for orange roughy (*Hoplostethus atlanticus*) on seamounts in New Zealand. Oceanologica Acta 22: 593–602.

Clark M. 2001. Are deepwater fisheries sustainable? – The example of orange roughy (*Hoplostethus atlanticus*) in New Zealand. Fisheries Research Vol. 51 pp 123-135.

Clark, M. R., Rowden, A.A., Wright, I. and Consalvey, M. 2010. Spotlight 7: Graveyard Seamounts. Oceanography, 23 (1). March 2010.

Deep Sea Conservation Coalition. 2025. Submission on the Fisheries New Zealand review of sustainability measures for orange roughy (ORH 3B) for 2025/26. July 2025.

Dunn, M.R., Anderson, O.F. and Doonan, I.J. 2008. An evaluation of stock status for orange roughy on the east and south Chatham Rise in 2008. New Zealand Fisheries Assessment Report 2008/65. 30 p.

Dunn, M.R. 2024a. Stock assessment research for Chatham Rise orange roughy in 2023. New Zealand Fisheries Assessment Report 2024/46. 36 p.

Dunn, M.R. 2024b. Assessment of the Challenger Plateau orange roughy stock for 2024. New Zealand Fisheries Assessment Report 2024/58. 42 p.

Fisheries New Zealand. 2025a. Review of sustainability measures for orange roughy (ORH 3B) for 2025/26. Fisheries New Zealand Discussion Paper 2025/24. June 2025.

Fisheries New Zealand. 2025b. Orange roughy Chatham Rise and Southern New Zealand (ORH 3B). *In* Fisheries New Zealand (2025). Fisheries Assessment Plenary, May 2025: stock assessments and stock status. Compiled by the Fisheries Science Team, Fisheries New Zealand, Wellington, New Zealand. 1955 p.

Horn, P.L. and 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. New Zealand Fisheries Assessment Report 2019/29. 34 p.

Watson, M. 2023 New Zealand orange roughy fishery self-suspends part of its MSC certificate. Marine Stewardship Council, 6 December 2023.

South Pacific Regional Fisheries Management Organisation. 2025. CMM 03a-2025 Conservation and Management Measure for Deepwater Species in the SPRFMO Convention Area. (Supersedes CMM 03a-2023)

Tingley, G. and Dunn, M. (eds) 2018. Global review of orange roughy (*Hoplostethus atlanticus*), their fisheries, biology and management. FAO Fisheries and Aquaculture Technical Paper 622.

MRAG Americas Assessment Team's Response:

Thank you for your comments. Most of the information submitted pertains to the ORH3B ESCR stock, which was self-suspended in December 2023. While our surveillance report does not cover ESCR, we do cover it in the MSC's Improvement Program and will note the information that pertains to that stock in that update.

You are correct about the situation with regard to the NWCR. However, the assessment is for a stock unit so the biomass estimates for Morgue and Graveyard are pooled for assessment purposes. There is clearly uncertainty about the NWCR assessment that exceeds what was perceived before but this is reflected adequately in the model runs and the uncertainty measures. Our Principle 1 expert, Dr. Andre Punt, has included a recommendation that simulation work be conducted to further understand the performance of the estimation method.

It was also noted that the HSS has not been reviewed in quite some time, however that would be to reach the 100-level score and is best dealt with at the recertification stage.

As detailed in Table 11, the fishery reported large catches (6003.65 kg) of stony corals observed in the NWCR UoA in 2024.

DWCs benthic habitat management strategies work to reduce catches of live epi-benthic organisms to as near to zero as practicable. Following the bycatch event in 2024 the fishery implemented their Monitor, Pause, Survey and Assess (MPSA) management strategy. The strategy includes the following:

- Monitor: Regular reporting of non-fish bycatch by observers and industry.
    - Training key crew members in epi-benthic species identification to differentiate between live and dead coral, and improved use of reporting codes)
    - Trigger-point reporting to DWC if designated VBA indicator taxa reach agreed triggers (e.g., 50 kg of any VBA Indicator species).
    - Annually review each towline to assess if catches of designated VBA indicator taxa reach agreed triggers (e.g., 50kg of any VBA Indicator species).
- Pause: Fishing on a towline would be paused if a pre-set trigger point is met or exceeded,
    - DWC will notify the fleet that a trigger was met, provide the coordinates of the towline and will request that fishing ceases along this towline until the VBA characteristics can be assessed.
- Survey: The towline and the area adjacent to the paused towline is prioritised for benthic biodiversity survey under the five-year research programme contracted to CSIRO.
- Assess: Survey results are assessed to determine any BMA characteristics in the vicinity of the paused towline, consider and implement appropriate management measures (e.g., reopening of the towline, or determining the level of protection including designation as a MBA, should the area conform with the definition of a VBA)

More details on this process can be found in the DWC Deepwater Trawl Benthic Operational Procedures.

This surveillance audit reviewed updates from the 2023/24 fishing season which demonstrated the high coral bycatch. However, bycatch has not yet been reported for 2025. The team will revisit this topic at the next surveillance audit to determine whether the strategy in place is working.

7. References (Bibliography)

Principle 1:
Dunn, M.R., Datta, S., and Doonan, I.J. (2025a). Stock assessment of Chatham Rise orange roughy in 2025. New Zealand *Fisheries Assessment Report 2025/46. 59 p.* Retrieved from https://www.mpi.govt.nz/dmsdocument/70806-FAR-202546-Stock-assessment-of-Chatham-Rise-orange-roughy-in-2025

Dunn, M. R., Doonan, I.J., and Anderson, O.F. (2025b). Additional analyses for orange roughy (ORH 3B). New Zealand *Fisheries Assessment Report 2025/18. 43 p.* Retrieved from FAR 2025/18 Additional analyses for orange roughy (ORH 3B)

Fisheries New Zealand. (2024). Medium Term Research Plan for Deepwater Fisheries 2024/25 to 2029/30. Fisheries New Zealand Information Paper No: 2024/03. 42 p. Wellington, New Zealand. Retrieved from https://www.mpi.govt.nz/dmsdocument/21746-medium-term-research-plan-for-deepwater-fisheries

Fisheries New Zealand. (2025a). *Fisheries Assessment Plenary May 2024 Volume 2: Orange Roughy (ORH 7A)*. Wellington, New Zealand. Retrieved from Orange roughy (ORH 7A) – Fisheries Assessment Plenary May 2024 Volume 2 (mpi.govt.nz)

Fisheries New Zealand. (2025b). *Fisheries Assessment Plenary May 2025 Volume 2: Orange Roughy (ORH 3B)*. Wellington, New Zealand. Retrieved from Orange roughy (ORH 3B) – Fisheries Assessment Plenary May 2024 Volume 2 (mpi.govt.nz)

Ryan, T. and Tilney, R. (2023). Acoustic Biomass Surveys of Orange Roughy Spawning Aggregations in ORH 3B NWCR and ORH 3B ESCR Chatham Rise, June/July 2022. *Draft New Zealand Fisheries Assessment Report*. 79 p. Retrieved from https://deepwatergroup.org/wp-content/uploads/2024/12/NZ2022_FAR_format_ORH3B_Chatham_Rise_final-071223.pdf

Principle 2:

Anderson, O F & Finucci, B. (2022). Non-target fish and invertebrate catch and discards in New Zealand orange roughy and oreo trawl fisheries from 2002–03 to 2019–20. New Zealand Aquatic Environment and Biodiversity Report No. 282. Retrieved from https://www.mpi.govt.nz/dmsdocument/50

Baird, S. and Mules, R. (2023). Extent and intensity of bottom contact by commercial trawling and shellfish dredging in New Zealand waters, 1990–2021. New Zealand Aquatic Environment and Biodiversity Report No. 316. 174 p. Retrieved from https://www.mpi.govt.nz/dmsdocument/57907-AEBR-316-Extent-and-intensity-of-bottom-contact-by-commercial-trawling-and-shellfish-dredging-in-New-Zealand-waters-19902021

Deepwater Group. (2025). Orange Roughy Trawl - Situation Report. Report prepared for the Third MSC Surveillance Audit, 54 pages.

February 2020. 41p.

Fisheries New Zealand (FNZ), 2025. Fisheries Infosite: Orange Roughy South East (Chatham Rise) (ORH3B). https://fs.fish.govt.nz/Page.aspx?pk=8&tk=41&ey=2025

FNZ, 2025b. Fisheries Infosite: Orange Roughy Challenger (North) (ORH7A). https://fs.fish.govt.nz/Page.aspx?pk=8&tk=41&ey=2025

Fisheries New Zealand. (2025c). *Fisheries Assessment Plenary May 2025 Volume 2: Orange Roughy (ORH 3B)*. Wellington, New Zealand. Retrieved from Orange roughy (ORH 3B) – Fisheries Assessment Plenary May 2025 Volume 2 (mpi.govt.nz)

Fisheries New Zealand. (2025d). *Fisheries Assessment Plenary May 2025 Volume 2: Orange Roughy (ORH 7A)*. Wellington, New Zealand. Retrieved from Orange roughy (ORH 7A) – Fisheries Assessment Plenary May 20245 Volume 2 (mpi.govt.nz)

Fisheries New Zealand. (2025e). Fisheries Assessment Plenary May 2025 Volume 2: Oreos (OEO 4). Wellington, New Zealand. Retrieved from https://www.mpi.govt.nz/dmsdocument/69846-Fisheries-Assessment-Plenary-May-2025-Volume-2-OREOS-OEO-4-BLACK-OREO-AND-SMOOTH-OREO

MacGibbon, D.J.; Mules, R. (2023). Extent and intensity of bottom contact by commercial trawling and shellfish dredging in New Zealand waters, 1990–2021. New Zealand Aquatic Environment and Biodiversity Report No. 316. 174 p. Retrieved from https://www.mpi.govt.nz/dmsdocument/57907/direct

McMillan, P. J., Francis, M. P., James, G. D., Paul, L. J., Marriott, P., Mackay, E. J., Wood, B. A., Stevens, D. W., Griggs, L. H., Baird, S. J., Roberts, C. D., Stewart, A. L., Struthers, C. D., and Robbins, J. E. (2024). New Zealand fishes. A field guide to common species caught by bottom, midwater, and surface fishing for New Zealand fishers. New Zealand Aquatic Environment and Biodiversity Report No. 333. 287 p. Retrieved from AEBR 333 New Zealand fishes. A field guide to common species caught by bottom, midwater, and surface fishing for New Zealand fishers

NIWA, 2025. Trawl Survey Information Portal. https://tsip-uat.niwa.co.nz/search

Stevens, D. W., Ballara, S. L., Maurice, A., Escobar-Flores, P. C. and Yeoman, J. (2024 Trawl survey of hoki and middle depth species on the Chatham Rise, January 2024 (TAN2401). New Zealand Fisheries Assessment Report 2024/77. 118 p. Retrieved from https://www.mpi.govt.nz/dmsdocument/65925/direct

Stephenson et al. (2022)
Stephenson, F, Geange, S, Rowden, A, Charsley, A, Anderson, O, & Biggerstaff, A. (2022). Further analysis of VME indicator taxa, catchability, and the design of a related research programme (SC10-DW04). South Pacific Regional Fisheries Management Organisation. Retrieved from https://www.sprfmo.int/assets/Meetings/SC/10th-SC-2022/SC10-DW04Further-analysis-of-VME-indicator-taxa-catchability-and-the-design-of-a-related-research-programme-NZ.pdf

Tracey, D. M. and Hjorvarsdottir, F. (2019). The State of Knowledge of Deep-Sea Corals in the New Zealand Region. NIWA Science and Technology Series Number 84. 140 p. Retrieved from Deepsea-corals-NZ-2019-NIWA-SciTechSeries84.pdf

Principle 3:

Cleal, J. (2025). Deepwater Group Environmental Liaison Officer (ELO) Report for 2023-24 Fishing Year. Nelson, New Zealand. Retrieved from https://deepwatergroup.org/wp-content/uploads/2024/12/FVMS-ELO-Report-2023-24.pdfFNZ, 2024. Deepwater Annual Review Report 2022/2023.

Minister for Oceans and Fisheries. (2025). Decision letter: Review of sustainability measures for fisheries – October 2025 round. Wellington, New Zealand: Ministry for Primary Industries. Retrieved from Minister for Oceans and Fisheries decision letter – Review of sustainability measures for fisheries – October 2025 round

Ministry for Primary Industries (MPI), 2025. Fish Quota Management System. https://www.mpi.govt.nz/fishing-aquaculture/fisheries-management/deepwater-fisheries

MPI, 2024. Medium term research plan for deepwater fisheries 2024/25 – 2029/30. Fisheries New Zealand Information Paper No. 2024/03. August 2024. https://www.mpi.govt.nz/dmsdocument/21746-Medium-Term-Research-Plan-for-Deepwater-Fisheries-Report