



**Fisheries New Zealand**

Tini a Tangaroa

# **Review of Sustainability Measures for Orange Roughy (ORH 3B) for 2020/21**

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# 1 Stocks being reviewed

## Orange roughy (ORH 3B)

*Hoplostethus atlanticus*; nihorota

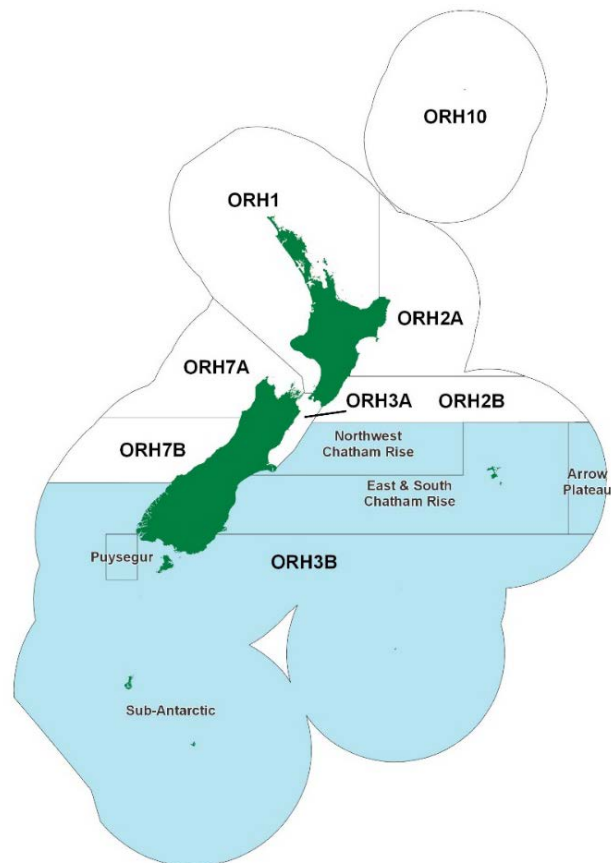


Figure 1: Quota Management Areas (QMAs) for orange roughy, with ORH 3B highlighted

## 2 Summary

1. Fisheries New Zealand is reviewing the sustainability measures for orange roughy in Quota Management Area 3B (ORH 3B) for the 1 October 2020 fishing year.
2. Orange roughy is essentially a commercial-only, trawl fishery due to the depths and the distance from shore that the species is found.
3. There is no recreational allowance for ORH 3B and there is a customary allowance of five tonnes to account for commercial vessels fishing under customary permits, in particular to supply marae and pataka.
4. In 2018, the Minister of Fisheries agreed to a 3-year staged increase of the ORH 3B TAC and TACC; this is the final year of that staged increase.
5. An update of the stock assessment in 2020 indicates the orange roughy biomass has continued to increase and a larger TAC and TACC increase than considered previously may be warranted.

6. Fisheries New Zealand proposes increasing the Total Allowable Catch (TAC), allowances for other sources of fishing related mortality, and the Total Allowable Commercial Catch (TACC).
7. The Total Allowable Catch (TAC) of the stock is currently 7,116 tonnes, of which 6,772 tonnes is the Total Allowable Commercial Catch (TACC). Two options are proposed; both recognise there is an opportunity to increase utilisation of the stock. The two options are:

**Option 1** is a 13% increase to the TAC, TACC and allowance for other mortality caused by fishing, and provides for a modest increase in catch. This option is consistent with the Minister's decisions for the 2018/19 and 2019/20 fishing years. Option 1 would:

- increase the ORH 3B TAC by 939 tonnes (13%) to 8,055 tonnes;
- increase the TACC by 895 tonnes (13%) to 7,667 tonnes;
- increase the allowance for all other fishing related mortality by 44 tonnes (13%) to 383 tonnes;
- retain the current allowance for Customary Maori (5 tonnes);
- retain the current allowance for recreational interests (0 tonnes); and
- increase the catch limit for the East and South Chatham Rise (ESCR) by 895 tonnes (19%) to 5,670 tonnes.

**Option 2** is a 23% increase to the TAC, TACC and allowance for other mortality caused by fishing, and provides for a larger increase in catch. This is the result of updating the stock assessment with recent catch information and applying the agreed Harvest Control Rule. Option 2 would:

- increase the ORH 3B TAC by 1,651 tonnes (23%) to 8,767 tonnes;
- increase the TACC by 1,573 tonnes (23%) to 8,345 tonnes;
- increase the allowance for all other fishing related mortality by 78 tonnes (23%) to 417 tonnes;
- retain current allowance for Customary Maori (5 tonnes);
- retain current allowance for recreational interests (0 tonnes); and
- increase the catch limit for the East and South Chatham Rise (ESCR) by 1,573 tonnes (33%) to 6,348 tonnes.

Table 1. Proposed Options for ORH 3B TACs, TACCs, allowances and Sub-QMA catch limits (tonnes) from 1 October 2020

	Current TAC, TACCs, allowances and catch limits	Option 1	Option 2
TAC	7,116	↑ 8,055	↑ 8,767
TACC (for all sub-QMAs)	6,772	↑ 7,667	↑ 8,345
Allowance for other mortality caused by fishing	339	↑ 383	↑ 417
Customary Māori allowance	5	5	5
Northwest Chatham Rise	1,150	1,150	1,150
East and South Chatham Rise	4,775	↑ 5,670	↑ 6,348
Puysegur	347	347	347
Arrow Plateau	0	0	0
Sub-Antarctic	500	500	500

8. Fisheries New Zealand is seeking feedback and submissions on the proposals to increase the TAC, TACC, allowances and catch limit for ORH 3B.

## 3 Quota Management System

9. Orange roughy entered the QMS in 1986 with eight Quota Management Areas (QMAs) and an October fishing year.
10. In most/all cases, the QMAs for orange roughy do not align with biological stocks. Statutory catch limits in the form of total allowable catches (TACs), and total allowable commercial catches (TACCs), are set for each QMA.
11. Genetics, geographical separation and the distribution of orange roughy indicate that there are at least four biological sub-stocks within ORH 3B – Northwest Chatham Rise, East and South Chatham Rise, Sub-Antarctic and Puysegur (Figure 1).
12. For more information about the QMS go to <https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>

### 3.1 Non-regulatory arrangements

13. The Minister sets the TAC and TACC for the ORH 3B stock as a whole. ORH 3B quota owners, through the Deepwater Group Ltd (DWG), which represents approximately 98% of the ORH 3B quota owners, agree each year to adhere to catch limits at a sub-QMA level for the individual sub-stocks. These are non-regulatory catch limits.
14. Adherence to the catch limits is monitored by Fisheries New Zealand and reported annually in the Deepwater Fisheries Annual Review Report<sup>1</sup>. There have been high levels of adherence to the sub-QMA catch limits.

## 4 Legal basis for managing fisheries in New Zealand

15. The Fisheries Act 1996 provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* at <https://www.fisheries.govt.nz/dmsdocument/40502> for more information.

## 5 Treaty of Waitangi obligations

### 5.1 Input and participation of tangata whenua

16. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Each Iwi Fisheries Forum has developed an Iwi Fisheries Forum Plan that described how the iwi in the Forum exercise kaitiakitanga over the fisheries of importance to them, and their objectives for the management of their interest in fisheries. Particular regard will be given to kaitiakitanga when making sustainability decisions.
17. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.
18. The iwi of the South Island and Chatham Islands are likely to constitute tangata whenua in the area of ORH 3B.
19. Input and participation on the proposal to increase the TAC and TACC for ORH 3B through a series of staged increases over three years was presented to the Te Waka a Māui me Ōna Toka Iwi Forum (representing the nine iwi of the South Island) in 2018. This forum supported a review of the ORH 3B fishery. The proposal for a staged increase was also discussed with

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<sup>1</sup> <https://www.mpi.govt.nz/dmsdocument/39770-annual-review-report-for-deepwater-fisheries-2018-19>

Chatham Islands iwi and imi as part of a general engagement process in 2018. No views were expressed by the Chatham Islands groups. Ngai Tahu, Te Waka a Māui me Ōna Toka Iwi Forum, Kahungunu Asset Holding Company, and Ngati Whatua Fisheries all made submissions on the 2018 consultation. The iwi groups either expressed no view or were in favour of TAC/TACC increases.

20. Due to COVID-19 travel restrictions, input and participation from Iwi Fisheries Forums was sought through remote mechanisms. In late April 2020, information on the proposal to review ORH 3B was provided to Iwi Fisheries Forums electronically, and input sought. At the time of publication, no specific input had been received on the ORH 3B proposal.
21. Given the disruption to services, the opportunity for input from the Iwi Fisheries Forums has been impacted and any further input will be included in the final advice and recommendations provided to the Minister.

## 5.2 Kaitiakitanga

22. Orange roughy (nīhorota) is listed as a taonga species in Te Waipounamu (all of South Island) Iwi Fisheries Plan. Te Waka a Māui me Ōna Toka Iwi Forum consider all fish species taonga.
23. Te Waipounamu plan contains objectives to support and provide for the interests of South Island iwi, and contains two objectives which are relevant to the management options proposed for ORH 3B:
  - **Management Objective 3:** to develop environmentally responsible, productive, sustainable, and culturally appropriate commercial fisheries that create long-term commercial benefits and economic development opportunities for South Island iwi.
  - **Management Objective 5:** to restore, maintain and enhance the mauri and wairua of fisheries throughout the South Island.
24. Imi (Moriori) and iwi (Ngāti Mutunga of Chatham Islands (Rēkohu/Wharekauri) have listed pātohe orange roughy as a taonga species in their CIFF@44° (Chatham Island Fisheries Forum plan; includes Rangihau/Rangiauria-Pitt Island). Imi and Iwi regard all fish as customary fish. Three management objectives of CIFF@44° which are particularly relevant to the management options proposed for ORH 3B are:
  - **Management Objective 2:** Kaitiakitanga is fundamental to the management of all fisheries resources.
  - **Management Objective 5:** Thriving Fisheries. Thriving sustainable fisheries that are enduring for present and future generations.
  - **Management Objective 6:** Traditional Fisheries. Fisheries and fisheries areas of cultural significance are protected, maintained and enhanced.
25. There are no customary fisheries management tools such as mātaītai, taiāpure or Section 186B temporary closures relevant to this review.
26. In Fisheries New Zealand's view, the proposed TAC/TACC increase under both options contributes towards Te Waipounamu plan and Chatham Island Fisheries Forum plan objectives described above. This is based on the potential to increase commercial activity and therefore economic development opportunities for South Island iwi and Chatham Islands iwi and imi quota holders. At the same time, the mauri and wairua of fisheries is maintained or enhanced because the abundance of orange roughy in ORH 3B continues to improve, whilst environmental impacts are avoided or mitigated by existing regulatory and non-regulatory arrangements.

## 6 Relevant plans, strategies, statements and context

### 6.1 National Deepwater Plan

27. Orange roughy in ORH 3B is managed as a Tier 1 species within the National Fisheries Plan for Deepwater and Middle-depth fisheries 2019 – Part 1A (National Deepwater Plan). A species-specific chapter of the National Deepwater Plan for orange roughy (Part 1B) was completed in 2012. The National Deepwater Plan sets out a series of Management Objectives for deepwater fisheries, the most relevant to ORH 3B being:
- **Management Objective 1:** Ensure the deepwater and middle-depth fisheries resources are managed so as to provide for the needs of future generations.
  - **Management Objective 4:** Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy or reference points.
28. The National Deepwater Plan is a formally approved s11A fisheries plan which the Minister must take into account when making sustainability decisions.
29. There are no other plans, strategies or statements relevant to orange roughy or ORH 3B.

### 6.2 Harvest Strategy

30. Orange roughy stocks are generally monitored using acoustic surveys and stock assessments completed every four years, as recommended by the Management Strategy Evaluation (MSE) for orange roughy which was completed in 2014.
31. The Management Strategy Evaluation assumes that stocks are surveyed and management settings are adjusted every four years. It recommends a management target range of 30-50% of unfished biomass ( $B_0$ ), a soft limit of 20%  $B_0$ , and a hard limit of 10%  $B_0$ , to ensure the stock is resilient to natural fluctuations such as periodic recruitment pulses and long-term fluctuations in biomass (Table 2).

Table 2: Harvest Strategy for ORH 3B

Reference point	Management response
Management target 30-50% $B_0$	Stock permitted to fluctuate around this management target, which has a median value of 40% $B_0$ . TAC/TACC changes will be employed to keep the stock around the target.
Soft limit of 20% $B_0$	A formal time constrained rebuilding plan will be implemented if this limit is reached in accordance with the Harvest Strategy Standard
Hard limit of 10% $B_0$	This is the limit below which fisheries will be considered for closure.

32. The Management Strategy Evaluation underpinned the development of a Harvest Control Rule (HCR) for orange roughy. This involved testing the performance of a number of potential harvest control rules against simulated stock trajectories over long periods of time.
33. The agreed HCR is estimated to have a greater than 97% probability of maintaining the stock above the lower boundary of the management target range, under a series of assumptions about stock-recruit relationships and estimates of natural mortality in the long term.
34. The HCR is used to suggest catch limits which are based on the estimated stock status in relation to the management target range of 30-50% of  $B_0$ . Where a stock is estimated to be below the midpoint of the target range, recommended catch limits are lower than for a stock near the top of the target range. Likewise, the HCR allows for a higher catch limit for stocks that are above the mid-point of the target range (40%  $B_0$ ).
35. The HCR is based on an exploitation rate of 0.045 (meaning 4.5% of vulnerable biomass can be caught) for a stock that is at the midpoint of the management target range. For a stock at the



lower bound of the management target range, the exploitation rate would be 0.03375 (or 3.375% of the vulnerable biomass can be caught), and similarly, for a stock at the upper bound, the exploitation rate would be 0.05625.

36. Fisheries New Zealand intends to review the HCR and the Management Strategy Evaluation used to derive the HCR for orange roughy in 2020 to inform future catch limit reviews for orange roughy stocks.

## 7 Current state of the stocks

### *Information supporting Option 1*

37. An acoustic survey in 2016 underpinned stock assessments in 2017 for two key sub-stocks in ORH 3B: Northwest Chatham Rise (NWCR), and East and South Chatham Rise (ESCR). Orange roughy abundance in both NWCR and ESCR was estimated to be increasing.
38. For ESCR, the 2017 stock assessment estimated that the stock was at 33%  $B_0$  and there was an 86% probability that the stock was above the lower bound of the management target range of 30% of  $B_0$  in 2017 (Figure 2).

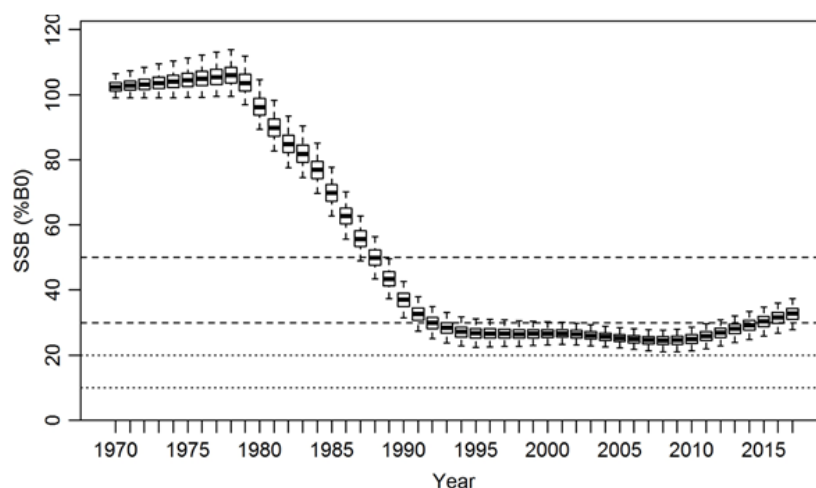


Figure 2. East & South Chatham Rise estimated spawning stock biomass trajectory, 2017 assessment. The box in each year covers 50% of the distribution, and the whiskers extend to 95% of the distribution. Dotted lines indicate the hard limit (10%  $B_0$ ) and the soft limit (20%  $B_0$ ) and the dashed lines the biomass target range (30-50%  $B_0$ ).

39. The HCR was applied to this biomass estimate, using an exploitation rate of 0.038, which resulted in an estimate of sustainable yield of 5,970 tonnes for the ESCR. This, adjusted for other sources of fishing related mortality, formed the basis of the three-year staged increase agreed in 2018.
40. Figure 3 shows the ESCR projected stock status for the next eight years after applying a catch limit of 5,670 tonnes plus 5% to allow for incidental mortality. Biomass is estimated to continue increasing to be 41%  $B_0$  in 2028.

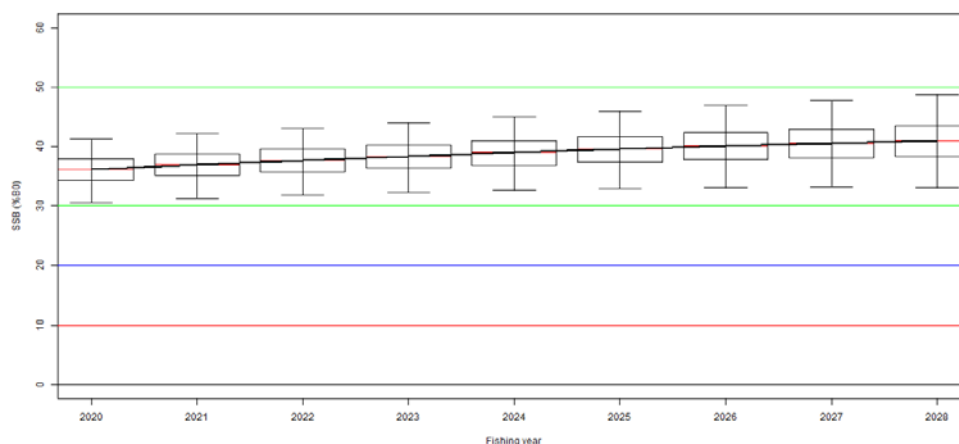


Figure 3. Projected stock status under the current model (2020) for catches at the HCR recommended catch limit for ESCR from 2017 of 5,670 tonnes. Each box covers the middle 50% of the distribution and the whiskers extend to 95% confidence intervals.

#### Information supporting Option 2

41. In 2020, the stock assessment for ESCR was updated to incorporate recent catch information. There were no updated abundance indices to inform the update of the assessment. The 2020 assessment estimated the stock to have increased to 36%  $B_0$  (Figure 4).

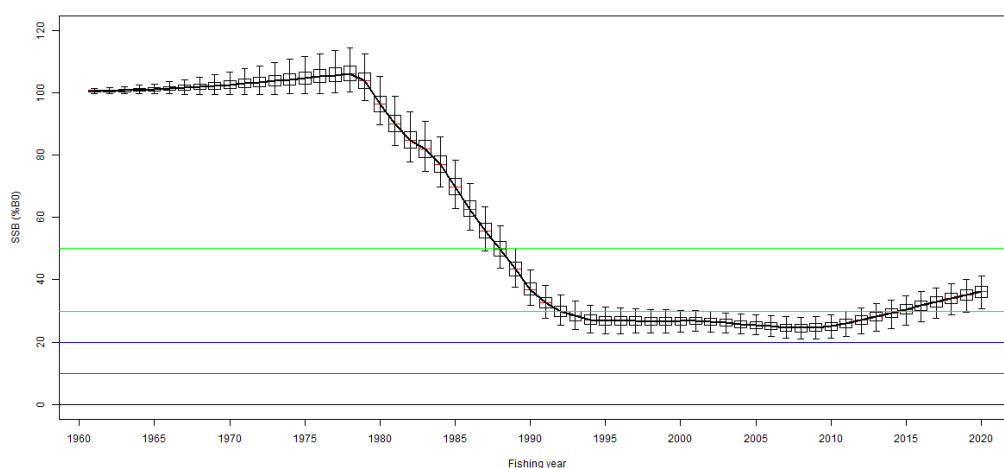


Figure 4. East & South Chatham Rise estimated spawning stock biomass trajectory, 2020 assessment update. The box in each year covers 50% of the distribution and the whiskers extend to 95% of the distribution. Horizontal lines are plotted at the hard limit (10%  $B_0$ ), the soft limit (20%  $B_0$ ), and the biomass target range (30–50%  $B_0$ ).

42. The HCR was applied to the outputs of the updated stock assessment which gave a HCR-derived suggested catch limit of 6,348 tonnes based on an exploitation rate of 0.04275. Figure 5 shows the ESCR projected stock status for the next eight years after applying a catch limit of 6,348 tonnes plus 5% to allow for incidental mortality. Biomass is estimated to continue increasing to be 40%  $B_0$  in 2028.

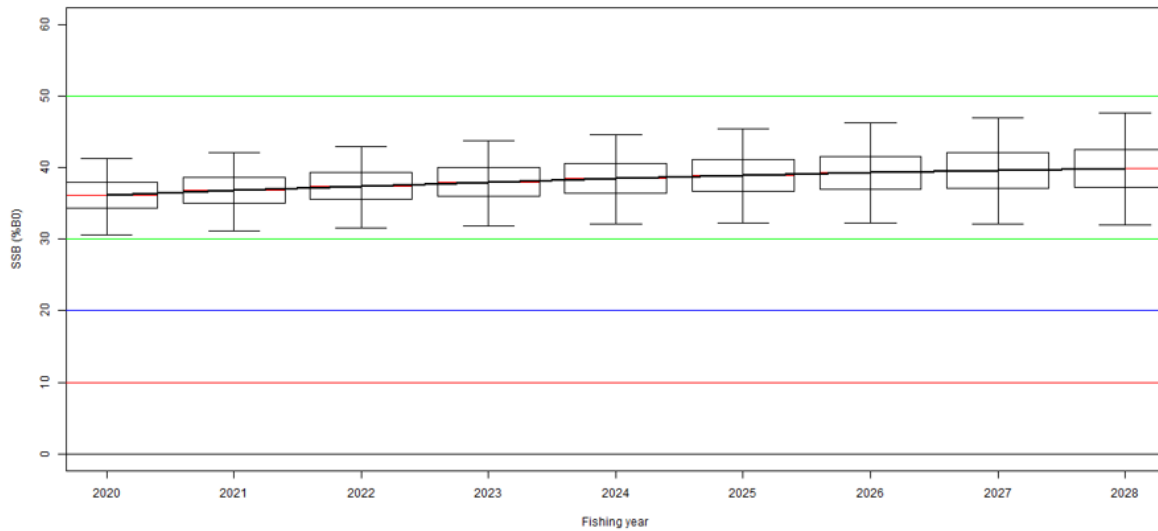


Figure 5: Projected stock status under the current model (2020) for catches at the HCR recommended catch limit for the ESCR of 6,348 tonnes. Each box covers the middle 50% of the distribution and the whiskers extend to 95% confidence intervals.

## 8 Recent catch levels and trends

43. All orange roughy is caught by the commercial fishing sector. Commercial orange roughy fishing uses bottom trawls, often targeting spawning aggregations. The main fishing grounds in ORH 3B are on the Chatham Rise, with smaller fisheries occurring at Puysegur and in the sub-Antarctic (Figure 1). Estimated catch of orange roughy and catch limits for ESCR is shown in Figure 6.

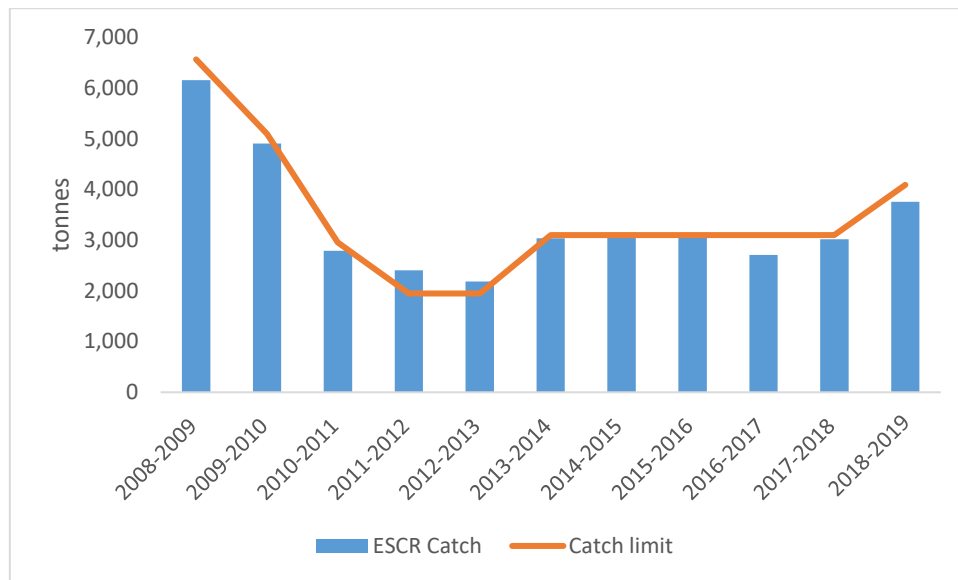


Figure 6. ORH 3B East and South Chatham Rise estimated catch vs catch limit (in tonnes) 2008/09 - 2018/19

## 9 Current TAC, TACC and allowances

Table 3. ORH 3B TAC, TACC, allowances and Sub-QMA catch limits (tonnes) from 1 October 2020

	Current catch limits 2019/20
TAC	7,116
TACC (for all sub-QMAs)	6,772
Allowance for other mortality caused by fishing	339
Customary Māori allowance	5
Northwest Chatham Rise	1,150
East & South Chatham Rise	4,775
Puysegur	347
Arrow Plateau	0
Sub-Antarctic	500

## 10 Options – varying the TAC and TACCs and allowances

44. Two options are proposed for the TAC, TACC and allowances for each stock. The options represent the general range of increases to catch settings being considered. Feedback is sought on these options, or alternatives within this range.

Table 4. Options for varying ORH 3B TACs, TACCs, allowances and Sub-QMA catch limits (tonnes) from 1 October 2020

	Status quo Current catch limits 2019/20	Option 1 Catch limits applying year 3 phased increase 2020/21	Option 2 Catch limits using updated stock assessment 2020/21
TAC	7,116	↑ 8,055	↑ 8,767
TACC (for all sub-QMAs)	6,772	↑ 7,667	↑ 8,345
Allowance for other mortality caused by fishing	339	↑ 383	↑ 417
Customary Māori allowance	5	5	5
Northwest Chatham Rise	1,150	1,150	1,150
East & South Chatham Rise	4,775	↑ 5,670	↑ 6,348
Puysegur	347	347	347
Arrow Plateau	0	0	0
Sub-Antarctic	500	500	500

### 10.1 Total Allowable Catch

45. The TAC for orange roughy is adjusted to take advantage of biomass increases. Option 1 proposes to increase the TAC by 13% from 7,116 tonnes to 8,055 tonnes. Option 2 proposes to increase the TAC by 23% from 7,116 tonnes to 8,767 tonnes.

## 10.2 Allowances

46. There are no reported customary authorisations for orange roughy at this time. There are no mataitai reserves or closures or restrictions under s186A of the Fisheries Act 1996 that impact orange roughy fishing in ORH 3B. Therefore, Fisheries New Zealand propose to retain the allowance for Māori customary take under both options at 5 tonnes.
47. Due to the depths and locations at which orange roughy are found, the recreational take of orange roughy is either negligible or non-existent. Fisheries New Zealand propose to retain a zero allowance for the recreational sector under both options.
48. The allowance for other sources of fishing-related mortality accounts for unreported orange roughy mortality (such as loss due to ripped nets). Fisheries New Zealand proposes to maintain the allowance for other sources of fishing related mortality at 5% of the TACC. This equates to an allowance of 383 tonnes for other sources of fishing-related mortality under Option 1 and 417 tonnes under Option 2.

## 10.3 Total Allowable Commercial Catch

49. Under Option 1, the TACC would increase by 13% from 6,772 tonnes to 7,667 tonnes. Based on orange roughy export data for the 2019 calendar year, the estimated short-term financial implication of increasing the TACC by 895 tonnes under Option 1 is an increase in FOB exports<sup>2</sup> of NZ\$ 11.4 million per annum if the entire TACC was caught.
50. Under Option 2, the Total Allowable Commercial Catch would increase by 23% from 6,772 tonnes to 8,345 tonnes. For Option 2, the estimated short-term financial benefit of increasing the TACC by 1,573 tonnes is an increase in FOB exports of approximately NZ\$ 20.1 million per annum if the entire TACC was caught.

## 11 Uncertainties and risks

51. The proposed increase in the TAC/TACC under either option is large enough to impact on orange roughy stock status should biomass estimates be too optimistic. However, the outputs of both the 2017 and 2020 stock assessments and the use of the agreed HCR to calculate a proposed catch limit for East and South Chatham Rise provides confidence that the stock can sustain an increase as proposed while remaining within the management target range.
52. The HCR assumes that stocks will be surveyed and assessed every four years. When the decision was made on the 2018 catch limits, an acoustic survey for the Chatham Rise orange roughy stocks was scheduled for winter 2020. This survey is not able to be completed as planned which reduces our ability to test whether the catch limit increases implemented since 2017 are having a different impact on biomass than projected.
53. This results in increased uncertainty in the projections and ongoing sustainability of any catch limit increases.

## 12 Environmental interactions

54. The key environmental interactions with the fishery, which must be taken into account are:

### 12.1 Marine mammals

55. The capture rate of marine mammals in ORH 3B target tows is very low; there was one observed fur seal capture between the 2013/14 and 2017/18 fishing years (average observer coverage was 27% over the five years).

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<sup>2</sup> Free on board. The value of export goods, including raw material, processing, packaging, storage and transportation up to the point where the goods are about to leave the country as exports. FOB does not include storage, export transport or insurance cost to get the goods to the export market.

56. The proposed TAC/TACC increases under either option are not expected to adversely affect the population of marine mammal species given the low capture rate of these animals.

## 12.2 Seabirds

57. Management of seabird interactions with New Zealand's commercial fisheries is guided by the National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries (NPOA-Seabirds) with a 2020 update expected to be released in coming months, following consultation earlier this year. The NPOA-Seabirds establishes a risk-based approach to managing fishing interactions with seabirds, targeting management actions at the species most at risk as a priority but also aiming to minimise captures of all species.
58. Trawlers longer than 28m are required to deploy seabird mitigation devices when fishing. Non-regulatory Vessel Management Plans may include additional practices to avoid seabird interactions, including offal management. Fisheries New Zealand monitors and audits performance against these plans.
59. The risk to seabirds from orange roughy fishing is considered to be negligible based on six seabird captures observed across all tows in all orange roughy, oreo and cardinalfish fisheries in 2018/19. This risk is likely to continue to be low under either of the options proposed.
60. The proposed TAC/TACC increases under either option are not expected to adversely affect the population of any seabird species given the low seabird capture rates in orange roughy fisheries.

## 12.3 Fish bycatch

61. The proposed option is likely to increase catch of associated species. The main fish bycatch species associated with orange roughy fishing include oreo, and deepwater sharks.
62. Based on the average annual smooth and black oreo catch from FMA 4 when targeting orange roughy between 2009/10 and 2018/19, it is estimated that the proposed orange roughy TACC increases may lead to an increase of approximately 13 tonnes in black oreo and 66 tonnes of smooth oreo caught under Option 1, and approximately 23 tonnes in black oreo and 111 tonnes of smooth oreo caught under Option 2, should the increase in ORH 3B TACC be fully caught.
63. These oreo species are caught as part of OEO 4, which is fully caught most years. Since OEO 4 is not proposed to be considered as part of the October 2020 sustainability round (so the TAC/TACC would be unchanged), fishers would likely need to adjust their effort when targeting both orange roughy and black and smooth oreo to avoid exceeding the TACC for oreos. Fisheries New Zealand will monitor oreo catch and adjust deemed values if there are issues to ensure that catch remains sustainable.
64. Management of shark species in New Zealand is driven by the National Plan of Action for Sharks (NPOA-Sharks) 2013. Fisheries New Zealand will continue to monitor interactions with deepwater sharks in orange roughy fisheries and consider management action if impacts are found to pose a sustainability risk to any deepwater shark species.

## 12.4 Benthic Impacts

65. Bottom trawling interacts with the seabed and benthic environment. Management measures have focused on avoiding these effects through closing areas to bottom trawling, starting with 17 seamount closures in 2001. Five of the seamount closures are within the ESCR and NWCR ORH 3B subareas – Pinnie, the Morgue and Pyre/Gothic group, Diamond Head and Seamount 328. In addition, the implementation of Benthic Protection Areas (BPAs) in 2007 effectively closed approximately 30% of the New Zealand EEZ to bottom trawling. Three of the BPAs are within the ESCR and NWCR ORH 3B subareas – Mid Chatham Rise, East Chatham Rise and Blink.

66. The trawl footprint in ORH 3B is estimated to have contacted 11% (5,298 km<sup>2</sup>) of the seabed in the ESCR sub-QMA, between 800-1600m depths from 2008-2018. Most fishing occurs within areas that have been fished for a number of years, and it is estimated that there is very little 'new' area trawled each year. Therefore, increasing the TAC and TACC under either of the proposed options is unlikely to increase the trawl footprint significantly.
67. The trawl footprint of the orange roughy fishery will continue to be mapped and monitored annually to assess if new areas are being impacted and consider possible management responses. The environmental impacts of fishing are summarised annually by Fisheries New Zealand in the Annual Review Report for Deepwater Fisheries as well as the Aquatic Environment and Biodiversity Annual Review 2018.

## 13 Questions for submitters on options for varying TACs, TACCs and allowances

68. Please provide detailed, verifiable information and rationale to support your views:
- Which option(s) do you support for revising the TACs and allowances? Why?
  - If you do not support any of the options listed, what alternative(s) should be considered? Why?
  - Are the allowances for other sources of mortality appropriate? Why?

## 14 Deemed values

69. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements. No changes are proposed to the deemed value rates for ORH 3B.

## 15 Referenced reports

Fisheries Assessment Plenary May 2020: <https://www.fisheries.govt.nz/news-and-resources/science-and-research/fisheries-research/>

Management Strategy Evaluation: <http://deepwatergroup.org/wp-content/uploads/2014/08/Cordue-2014-A-Management-Strategy-Evaluation-for-Orange-Roughy.-ISL-Re....pdf>

Deepwater Fisheries Plan: <https://www.mpi.govt.nz/growing-and-harvesting/fisheries/fisheries-management/deepwater-fisheries/>

Aquatic Environment and Biodiversity Annual Review <https://www.mpi.govt.nz/news-and-resources/science-and-research/fisheries-research/>

## 16 How to get more information and have your say

70. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 1 July 2020.
71. Please see the Fisheries New Zealand sustainability consultation webpage (<https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-october-2020/>) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email [FMSubmissions@mpi.govt.nz](mailto:FMSubmissions@mpi.govt.nz).