

Fisheries New Zealand

By email: FMSubmissions@mpi.govt.nz

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Review of proposed spawning area closure to orange roughy fishing in East and South Chatham Rise (ORH 3B) from 1 June 2026

SUBMITTER DETAILS

FULL NAME: Environmental Defence Society Incorporated
ADDRESS: PO Box 91736, Victoria Street West, Auckland 1142
CONTACT: Raewyn Peart
EMAIL: raewyn@eds.org.nz

Introduction

1. This is a submission on the proposed spawning area closure to the East and South Chatham Rise (**ESCR**) orange roughy spawning fishery within ORH 3B as set out in the Fisheries New Zealand (**FNZ**) Discussion Paper No: 2026/02 (**Discussion Paper**).¹
2. The Environmental Defence Society (**EDS**) is an independent not-for-profit organisation conducting interdisciplinary policy research and litigation. It was established in 1971 with the purpose of improving environmental outcomes in Aotearoa New Zealand.
3. EDS has a special interest in the marine environment and recently completed a multiyear project looking at issues within the national oceans management system and options for future reform. In September 2025 EDS released *Pathways to Oceans Reform: EDS Oceans Reform Final Report*.²
4. Fisheries management has been a core focus of EDS's work for many years. In 2018, EDS led an in-depth review of the national fisheries management system and published findings in a report entitled *Voices from the Sea: Managing New Zealand's Fisheries*.³ EDS is currently undertaking work to review the quota management system which has been in place now for 40 years. This submission draws on this

¹ FNZ. (2026). *Review of proposed spawning area closure to orange roughy fishing in East and South Chatham Rise (ORH 3B) from 1 June 2026* (Fisheries New Zealand Discussion Paper 2026/02), [**Discussion Paper**], available [here](#).

² Raewyn Peart. (2025). *Pathways to oceans reform: EDS oceans reform final report*, (EDS, September 2025), available [here](#).

³ Raewyn Peart. (2018). *Voices from the sea: Managing New Zealand's Fisheries*, (EDS, 2018), available [here](#).

work in continuing to seek improvements to fisheries decision-making for wild stocks.

Summary of Submission

5. The proposal to implement a spawning area closure for ESCR orange roughy is a positive step in managing a depleted stock. However, some of the proposed closure options are inadequate and risk further depletion and possibly the collapse of the stock.
6. EDS does not support a closure that only covers the Mt Muck (Option 1) or Rekohu (Option 2) spawning plumes, as they would provide inadequate protection.
7. Of the spatial options presented in the Discussion Paper, EDS favours a closure covering the north-west quadrant of the Spawning Box (Option 3). However, EDS does not consider this closure goes far enough and submits consideration should be given to closing the entire Spawning Box.
8. EDS supports a year-round closure (as opposed to a short seasonal closure) as this would better provide for variability in spawning aggregations, and better protect the broader ecosystem (including non-spawning orange roughy and the benthic environment), allowing for faster stock recovery.
9. Any closure should be accompanied by ongoing monitoring, not only to assess the efficacy of the measures, but to reduce the uncertainty that surrounds both the ESCR stock and orange roughy populations as a whole.

Depletion of the ORH 3B Fishery

10. The ORH 3B orange roughy fishery has historically been the largest in the country, with most catch coming from the ESCR sub-area. Effort there has largely focused on spawning aggregations within the Spawning Box (see Figure 1).⁴ In the early days of the orange roughy fishery it was not uncommon for nets to burst due to catch rates being so high.⁵

⁴ Ministry for Primary Industries. (2025). *Fisheries Assessment Plenary May 2025*, available [here](#), at 952.

⁵ Tingley, G., and Dunn, M. (Eds.). (2018). *Global review of orange roughy (*Hoplostethus atlanticus*), their fisheries, biology and management*. Food and Agriculture Organization of the United Nations, available [here](#), at 15.

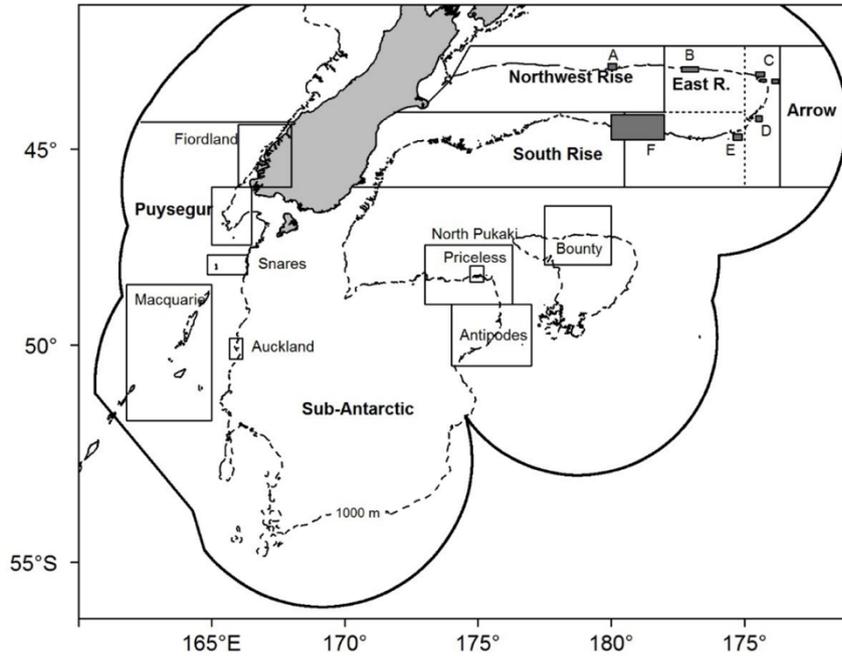


Figure 1. Map Reproduced from the Fisheries Assessment Plenary (2025) showing the “ORH 3B fishery sub-areas and the approximate position of other named orange roughy fisheries. Recognised stocks are indicated by bold text. The rectangles mark the main fishing grounds, with those on Chatham Rise shaded: A, Graveyard (including Morgue (closed to fishing) and Graveyard hills); B, Spawning Box; C, Smith’s City NE hills (includes Cameron’s); D, Andes; E, Chiefs; F, South Rise (Mt. Kiso and Hegerville). Old Spawning Plume, Rekohu, and Mt Muck are all within the Spawning Box (B).”⁶

11. Reported catch ranged between 20,000 t and 30,000 t early on in the development of the fisheries which targeted spawning aggregations on the Chatham Rise in the 1980s and early 1990s. This compares to approximately 2,000 t to 6,000 t since the 2010s.⁷ This decline in catch occurred despite the ORH 3B fishery expanding to include a far wider area, with the Puysegur and Sub-Antarctic fisheries developing in the 1990s, but quickly declining due to depletion.⁸

12. In response to depletion, with the initially-fished aggregations declining with increasing effort, the Spawning Box was put under temporary closure between 1992-93 and 1994-95.⁹ In previous years, the Spawning Box had consistently accounted for 50% to 70% of the catch, but it entered a period of sharp decline between the 1989-90 and 1991-92 fishing years. As noted above, this closure saw the ORH 3B fishery expand targeting previously unfished underwater topographical features (**UTFs**), and leading to serial depletion of populations (such as those on the southern Chatham Rise) that remain at low catch levels.

⁶ Ministry for Primary Industries, above n 4, at 952.

⁷ Ministry for Primary Industries, above n 4, at 950.

⁸ Ministry for Primary Industries, above n 4, at 956; Tingley and Dunn, above n 5, at 18; Harley, S. J. (1999). *Assessment of orange roughy fisheries from the southern areas of New Zealand for 1999* (New Zealand Fisheries Assessment Research Document 99/40). Ministry of Fisheries, at 1-2; FNZ. (2025). *Review of sustainability measures for June 2025 orange roughy (ORH 3B) for 2025/26* (Discussion Paper No. 2025/24), available [here](#), at 3-4.

⁹ Tingley and Dunn, above n 5, at 17-18; Ministry for Primary Industries, above n 4, at 951.

13. Chatham Rise orange roughy (ORH 3B) is currently divided into two stocks, Northwest Chatham Rise (**NWCR**) and ESCR, with each having its own agreed catch limits.¹⁰ The Spawning Box within the ESCR continues to contribute the majority of the ORH 3B catch, totalling 54% in the 2023-24 fishing year, although this only amounted to 1,445 t.¹¹ At present, the agreed catch limit for ESCR is 324 t, having been reduced from the previous 2,755 t in September 2025.¹²
14. The most recent stock assessment for ESCR was completed in 2025, and concluded the ESCR stock was significantly below the level supporting maximum sustainable yield (**MSY**).¹³ A 2020 assessment estimated the stock to be between 30% and 50% of virgin biomass, and to be rebuilding.¹⁴ Acoustic surveys conducted in 2023 raised concerns over the accuracy of this estimate and found stock biomass to be either flat or trending downwards.¹⁵ The primary issue identified with the earlier assessment was the excessive influence of commercial and research length frequency data which was found to be unreliable given the slow growth of orange roughy.¹⁶
15. The 2025 ESCR stock assessment utilised data up to the 2023-24 fishing year and found that the biomass was very unlikely (less than 10%) to be within the target range of 30-50% of virgin biomass.¹⁷ Additionally, it was estimated there was a greater than 60% chance that the stock was below the soft limit of 20% of virgin biomass.
16. There is a high degree of uncertainty around the 2025 biomass estimate itself, which produced median values ranging between 8% and 18% of virgin biomass, with a confidence of only 6% to 25%.¹⁸ This highlights the need for immediate and precautionary measures to prevent further depletion of the stock and significant investment in obtaining better stock information.

Proposed Closures

Basis for Spawning Closures

17. FNZ sets out why it is important to protect orange roughy spawning aggregations from fishing effort within the Discussion Paper.¹⁹ Broadly, this is because fishing effort causes:
- a) Physical disturbance leading to stress on individual fish
 - b) Dispersal of spawning aggregations leading to lower reproductive success

¹⁰ Tingley and Dunn, above n 5, at 17-18.

¹¹ Ministry for Primary Industries, above n 4, at 95.

¹² Jones, S. (2025). *Orange roughy, blue cod catch limits reduced*. New Zealand Government, available [here](#).

¹³ Ministry for Primary Industries, above n 4, at 981.

¹⁴ Ministry for Primary Industries, above n4, at 960.

¹⁵ Ministry for Primary Industries, above n 4, at 927.

¹⁶ Ministry for Primary Industries, above n 4, at 961-962.

¹⁷ Ministry for Primary Industries, above n 4, at 981-983.

¹⁸ Ministry for Primary Industries, above n 4, at 981.

¹⁹ Discussion Paper, above n 1, at [15]-[27].

- c) Removal of the most reproductively active individuals from the population. This leads to lower productivity during spawning seasons, which can significantly impact recovery rates for depleted populations.
18. The efficacy of closures as a response to stock depletion has been mixed and is highly contextual. However, there are several examples of success, including closures specifically targeting orange roughy in Aotearoa.
19. Fishing effort targeting orange roughy spawning aggregations within ORH 7A (Challenger Plateau) led to significant depletion in the 1990s, resulting in the loss of historic spawning aggregations and the effective closure of the fishery in 2001.²⁰ This led to stock recovery and the commercial fishery was reopened in 2015.²¹ However, since this reopening, catch peaked in 2021-22 at 2,193 t and has since decreased to 846 t in 2023-24. The total allowable commercial catch was lowered to 885 t in 2024-25 and a 2024 stock assessment estimated the stock to be at 16% to 35% of virgin biomass.²²
20. ORH 7B (West Coast South Island) experienced depletion in the 1990s and early 2000s, leading to effective closure of the fishery in 2007-08.²³ Since then, a preliminary assessment of the 7B stock found significant variation in results, making it unclear whether the stock had rebuilt and, if so, whether spawning aggregations had shifted to new locations.²⁴ This demonstrates the significant uncertainty that comes with rebuilding populations of orange roughy, as well as the slow population growth rates of highly depleted stocks.
21. The mixed success with spawning area closures overseas is noted in the Discussion Paper.²⁵ However, given the alternative which is to leave the fishery open to further depletion, EDS urges FNZ to act out of an abundance of caution.
22. FNZ notes that “closures would likely need to be in place for decades to have any measurable effect” given the low productivity of orange roughy.²⁶ However, leaving the ESCR open to further depletion will not aid the fishery in the long term.
23. Population productivity parameters for orange roughy are not well understood, with the limitations of current estimates acknowledged and noted as needing future research.²⁷ For example, understanding of recruitment rates between orange roughy

²⁰ Ministry for Primary Industries, above n 4, at 992-993; Tingley and Dunn, above n 5, at 19; Field, K. D., and Francis, R. I. (2001). *CPUE analysis and stock assessment of the Challenger plateau orange roughy stock (ORH 7A) for the 2000-01 fishing year* (New Zealand Fisheries Assessment Report 2001/25). Ministry of Fisheries, available [here](#), at 18.

²¹ Ministry for Primary Industries, above n 4, at 992; Tingley and Dunn, above n 5, at 19; Cordue, P. L. (2014). *The 2014 orange roughy stock assessments* (New Zealand Fisheries Assessment Report 2014/50). Ministry for Primary Industries, available [here](#), at 40-42.

²² Ministry for Primary Industries, above n 4, at 993, 999-1000.

²³ Ministry for Primary Industries, above n 4, at 1007.

²⁴ Ministry for Primary Industries, above n 4, at 1012-1013.

²⁵ Discussion Paper, above n 1, at [28]-[30].

²⁶ Discussion Paper, above n 1, at [27].

²⁷ Ministry for Primary Industries, above n 4, at 916; Horn, P. L., Tracey, D. M., Doonan, I. J., and Krusic-Golub, K. (2016). *Age determination protocol for orange roughy (*Hoplostethus atlanticus*)* (New Zealand Fisheries Assessment Report 2016/03). Ministry for Primary Industries, available [here](#), at 3.

stocks is lacking, despite this being key to determining the rebuilding rates of overfished stocks.²⁸

24. What *is* known is that the more the stock biomass is depleted, the lower the rate of population growth will be (also known as the allee effect), and therefore it will take proportionately longer for it to recover than if it was less depleted.²⁹
25. This is demonstrated by the difference in recovery between the ORH 7A and ORH 7B fisheries. Both were closed due to depletion, but ORH 7A has shown some recovery, while ORH 7B, which appears to have been depleted to a lower total biomass, has not.³⁰
26. For this reason, closures should be implemented in the ESCR fishery as soon as possible, and they need to provide effective protection. Allowing further depletion of the stock by failing to act, or by implementing an ineffective closure, will likely result in the need for future closures for a longer period, and stock collapse if left too late.

Spatial Extent

27. Fisheries NZ has proposed three options for the closure (see Figure 2):

- a) Option 1: Closure of Mt Muck (38km²)
- b) Option 2: Closure of Rekohu (788km²)
- c) Option 3: Closure of the north-west quadrant (spatially unspecified but would include Mt Muck, Rekohu and Old Plume spawning areas).³¹

²⁸ Ministry for Primary Industries, above n 4, at 916; Bull, B., Francis, R. I., and Tracey, D. M. (2001). *Estimation of orange roughy recruitment using age- and length-based models* (New Zealand Fisheries Assessment Report 2001/4). Ministry of Fisheries, at 4.

²⁹ Lundquist, C. J., and Botsford, L. W. (2011). Estimating larval production of a broadcast spawner: The influence of density, aggregation, and the fertilization allee effect. *Canadian Journal of Fisheries and Aquatic Sciences*, 68(1), 30-42, available [here](#), at 30-31.

³⁰ Ministry for Primary Industries, above n 4, at 992, 1007.

³¹ Discussion Paper, above n 1, at [28]-[30].

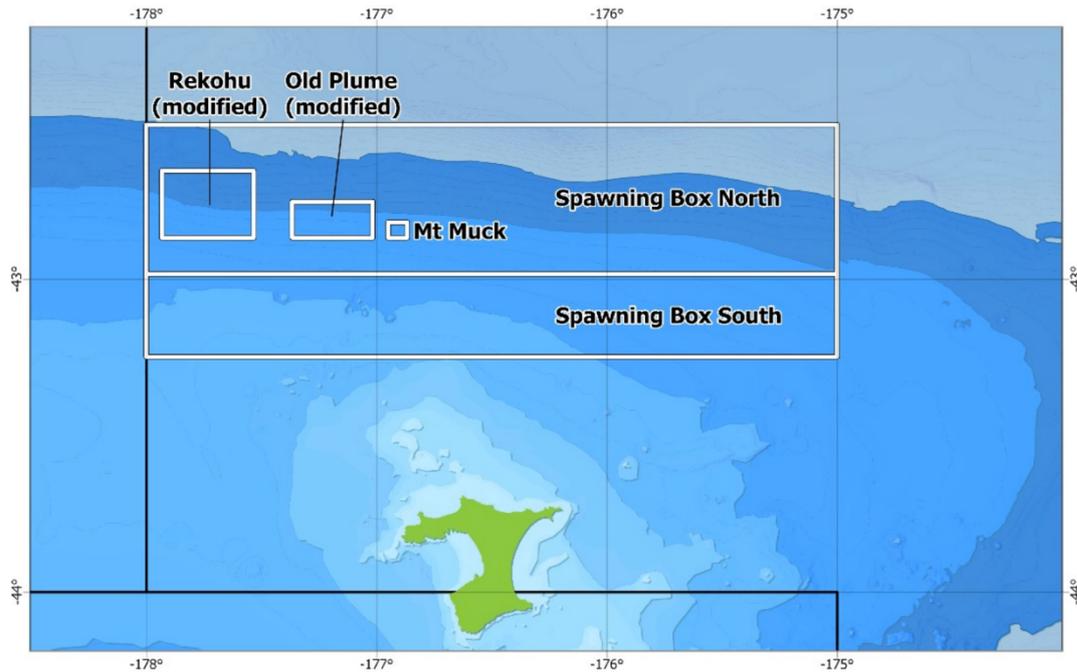


Figure 2. Map reproduced from the Discussion Paper showing “the three spawning areas on the East Chatham Rise.”³²

28. Of these options, EDS prefers Option 3 for the following reasons.

29. The first reason is to minimise the potential impact of edge effects. Closing any of the spawning plumes individually (for example, just Mt Muck or Rekohu) would lead to a greater impact of edge effects. Edge effects deplete biomass within a 1-2 km margin into the closed area due to fishing effort in the surrounding space.³³ As such, when a relatively smaller area is closed, edge effects cover a greater proportion of the total closed area than if a single, larger area is closed. The impact of edge effects on the three spatial options proposed would be as follows:

- a) Option 1 – the total closed area of 38 km² would be reduced to an effective area of less than 5 km² (a decrease of approximately 87%)
- b) Option 2 – the total closed area of 788 km² would be reduced to an effective area of 576 km² (a decrease of approximately 27% decrease)
- c) Option 3 - the total area or borders of the proposed closure is not presented in the Discussion Paper, but it would be significantly larger than Options 1 and 2, meaning a 1-2 km margin would cover proportionately less area.

30. Secondly, Option 3 would ensure that all three of the key spawning areas within the Spawning Box (Rekohu, Old Spawning Plume and Mt Muck) are within the effective area of the closure.

³² Discussion Paper, above n 1, at [44].

³³ Ohayon, S., Granot, I., and Belmaker, J. (2021). A meta-analysis reveals edge effects within marine protected areas. *Nature Ecology and Evolution*, 5(9), 1301-1308, available [here](#), at 1303-1304; Ohayon, S., Homma, H., Malamud, S., Ostrovsky, I., Yahel, R., Mehner, T., Kanari, M., and Belmaker, J. (2023). Consistent edge effect patterns revealed using continuous surveys across an Eastern Mediterranean no-take marine protected area. *ICES Journal of Marine Science*, 80(6), 1594-1605, available [here](#), at 1600-1603.

31. Thirdly, there is evidence that spawning closures have led to the displacement of fishing effort into surrounding areas on the Chatham Rise, such as the serial depletion of surrounding UTFs during the 1992-93 to 1994-95 Spawning Box closure.³⁴ If spawning plumes were closed individually, this could lead to significant depletion of plumes that remain open to fishing, or in areas surrounding the closures, leading to the exacerbation of edge effects. Closing the north-west quadrant in its entirety would prevent this from impacting the spawning plumes and thus would make the closure more effective in providing spawning protection.
32. Fourthly, closing a larger area provides more effective protection if the formation of spawning plumes shifts spatially. Shifts in spawning plume locations have occurred in the past, when orange roughy fisheries have been closed after high levels of depletion.³⁵ This appears to occur where spawning aggregations are unlinked to specific benthic features and thus already have some level of spatial variability, as was the case in ORH 7B, and also applies to the Old Spawning Plume within the Spawning Box.³⁶
33. The potential for these shifts may increase as the impacts of climate change are felt in the marine environment around Aotearoa. Such spawning aggregation shifts have already been observed in temperate to polar regions for species such as Atlantic cod.³⁷ It is unknown how this may specifically impact deepwater species around Aotearoa. Orange roughy are considered to have a low vulnerability to the impacts of climate change; nonetheless, the present lack of knowledge surrounding much of their biology and behaviour makes precaution vital.³⁸

Temporal Extent

30. EDS submits the closure should extend over the full year rather than only the assumed spawning period of 6.5 weeks from 1 June to 16 July for the following reasons.
30. First, as discussed above, climate change has led to variability in spawning aggregation patterns in temperate regions. This is not just spatial variability, but also temporal variability, with seasonal changes potentially altering the timing and/or duration of spawning.³⁹ Again, little is known about if and how this may impact

³⁴ Ministry for Primary Industries, above n 4, at 951; Tingley and Dunn, above n 5, at 17-18.

³⁵ Ministry for Primary Industries, above n 4, at 951

³⁶ Ministry for Primary Industries, above n 4, at 1012-1013; Discussion Paper, above n 1, at [55].

³⁷ Rogers, L. A., Monnahan, C. C., Williams, K., Jones, D. T., and Dorn, M. W. (2024). Climate-driven changes in the timing of spawning and the availability of walleye Pollock (*Gadus chalcogrammus*) to assessment surveys in the Gulf of Alaska. *ICES Journal of Marine Science*, 82(1), available [here](#), at 1-2, 7-8; McQueen, K., and Marshall, C. T. (2017). Shifts in spawning phenology of cod linked to rising sea temperatures. *ICES Journal of Marine Science*, 74(6), 1561-1573, available [here](#), at 1570-1571.

³⁸ FNZ, above n 8, at 32; Cummings, V. J., Lundquist, C. J., Dunn, M. R., Francis, M., Horn, P., Law, C., Pinkerton, M. H., Sutton, P., Tracey, D., Hansen, L., and Mielbrecht, E. (2021). *Assessment of potential effects of climate-related changes in coastal and offshore waters on New Zealand's seafood sector* (New Zealand Aquatic Environment and Biodiversity Report No. 261). Fisheries New Zealand, available [here](#), at 35.

³⁹ Rogers et al., above n 37, at 1-2, 10-11.

orange roughy spawning aggregations, but precaution will be key in ensuring the proposed closures remain effective.⁴⁰ This is especially the case given the low productivity of orange roughy means the timeframe of recovery efforts is in the order of decades.⁴¹ As such, a closure that extends over the entire year, rather than a seasonal window that is based on an estimation of current patterns (that may be inaccurate or may shift), would be most effective.

31. Secondly, a full-year closure would also extend protections in the region to non-spawning orange roughy throughout the year, including early and late spawners and pre- and post-spawning individuals. FNZ “propose that the closure would be in place until the ESCR sub-area achieves a target biomass of 40% SSB_{MSY}” (MSY-producing spawning stock biomass).⁴² While the ESCR sees the highest number of orange roughy during the spawning season when aggregations form, historic data shows significant proportions of orange roughy catch coming from this region throughout the rest of the year.⁴³ As such, protecting the region throughout the year would enable a faster rebuild.
32. Thirdly, allowing trawling for orange roughy in this area outside of the spawning season will continue to degrade important marine habitats. Many of the key orange roughy fisheries in Aotearoa, and a majority of historic catch in key areas (including the Chatham Rise), are associated with UTFs such as seamounts.⁴⁴ Bottom trawling fisheries that target UTFs can cause significant disturbance to the benthic communities that these features are associated with.⁴⁵ Notably, trawling can result in declines in species abundance, biodiversity and productivity of fragile ecosystems that provide key habitat and spawning locations, with timescales of recovery after closure being in the order of decades.⁴⁶ Closing the orange roughy trawl fishery year-round would help protect these features.
33. The recovery of these ecosystems is also likely to be of benefit to orange roughy spawning dynamics. The exact reason for the association of orange roughy spawning aggregations with UTFs is not known, with likely explanations including that topographical features provide a fixed location to aggregate, as well as the high productivity that these features often sustain. Nonetheless, there has been a shift of spawning aggregations on the NWCR from the Graveyard Hill (which is open to trawling year-round) to Morgue Hill, which has been closed to trawling since 2001,

⁴⁰ FNZ, above n 8, at 32; Cummings et al., above n 38, at 35.

⁴¹ Discussion Paper, above n 1, at [27].

⁴² Ibid.

⁴³ Ministry for Primary Industries, above n 4, at 950-951, 960-961.

⁴⁴ Doonan, I. J., Horn, P. L., and Maolagáin, C. Ó. (2014). Age composition of orange roughy from ORH 3B (Chatham rise: Northwest, 1994, and Northeast, 2013), and from ORH 7A (Challenger plateau in 1987, 2006 and 2009) (New Zealand Fisheries Assessment Report 2014/59). Ministry for Primary Industries, available [here](#), at 2-4; Clark, M. (1999). Fisheries for orange roughy (*Hoplostethus atlanticus*) on seamounts in New Zealand. *Oceanologica Acta*, 22(6), 593-602, available [here](#), at 595.

⁴⁵ 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*, 6, available [here](#), at 2-3.

⁴⁶ Clark et al., above n 45, at 12; Clark, M., and O'Driscoll, R. (2003). Deepwater fisheries and aspects of their impact on Seamount habitat in New Zealand. *Journal of Northwest Atlantic Fishery Science*, 31, 441-458, available [here](#), at 441-442.

although Morgue Hill itself has shown little evidence of ecological recovery.⁴⁷ This suggests that the year-round protection of these features may benefit spawning dynamics and thus the recovery of orange roughy.

Conclusion

34. EDS supports the need to implement spawning area closures within the ESCR orange roughy fishery within ORH 3B, as is demonstrated by the best available information.
35. Of the options provided by the Discussion Paper, EDS prefers:
 - a) A closure covering the north-west quadrant of the Spawning Box (Option 3).
 - b) A closure extending year-round, as opposed to just seasonal.
38. These measures should be accompanied by consistent monitoring, and broader protection of ORH 3B orange roughy should be considered (for example, closing a wider area such as the whole of the Spawning Box) to allow the stock to recover.

⁴⁷ Ministry for Primary Industries, above n 4, at 951; Clark et al., above n 46, at 8.