



Fisheries New Zealand

Tini a Tangaroa

Review of Sustainability Measures for Blue cod (BCO 3) for 2021/22

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1 Stock being reviewed

Blue Cod (BCO 3) – East Coast South Island

Parapercis Colias, blue cod, Rāwaru

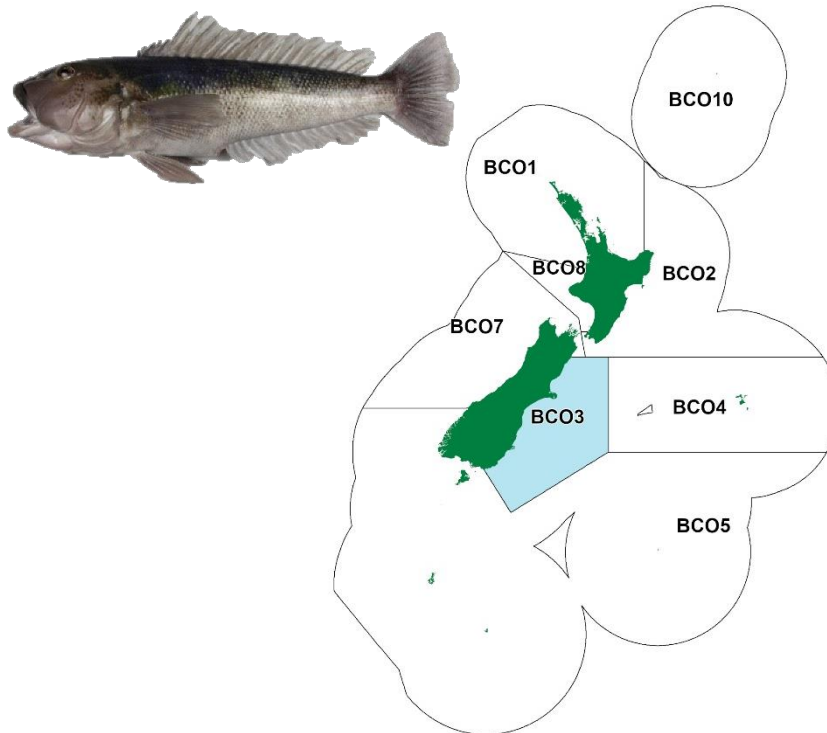


Figure 1: Quota Management Areas (QMAs) for Blue cod, with BCO 3 highlighted.

2 Summary

1. Fisheries New Zealand is reviewing sustainability measures for blue cod in Quota Management Area BCO 3 for the 1 October 2021 fishing year (Figure 1).
2. No Total Allowable Catch (TAC) or allowances were set when BCO 3 was put in the Quota Management System (QMS) under historical legislation, which only provided for setting a Total Allowable Commercial Catch (TACC). The fishery has not been formally reviewed since.
3. BCO 3 is New Zealand's largest recreational blue cod fishery and an important commercial fishery. Fishing is undertaken predominantly by targeted commercial potting and lining by recreational fishers. Most of the commercial catch (72%) is taken in the southernmost part of BCO 3 (below the Waitaki River).
4. The current status of BCO 3 in relation to the target is unknown as the standardised catch per unit effort (CPUE) series previously used to monitor the stock is now considered unreliable. Recreational fishing areas (and some key commercial areas) are also monitored by potting surveys carried out regularly in different regions of BCO 3. Since the late 1990s, these potting survey results have all been trending down.
5. In 2020, as part of the National Blue Cod Strategy, fine scale recreational daily limits, an increased minimum legal size, and larger pot mesh size for both commercial and recreational fishers were implemented to address these and other concerns about localised overfishing of blue cod.

6. Fisheries New Zealand is now proposing options for setting a TAC, allowances (customary, recreational and other sources of mortality caused by fishing), and a TACC for BCO 3, as follows:

Option 1 is to set a TAC of 277.732 tonnes, and within this TAC to set an allowance for Māori customary non-commercial fishing of 20 tonnes, to set an allowance for recreational fishing of 83 tonnes, and to retain the current TACC at 162.732 tonnes. The proposed recreational fishing allowance is 20% lower than the last recreational survey estimate, taking into account that the changes in recreational limits introduced in 2020 are expected to have reduced recreational catch. The allowance for other sources of mortality caused by fishing would be set at 12 tonnes, being 5% of the combined estimate of recreational catch and the TACC.

Option 2 is to set a TAC of 243 tonnes, and within this TAC to set allowances for Māori customary non-commercial fishing and recreational fishing at the same level as Option 1. The TACC under this option, however, would be reduced by 20% to 130 tonnes. This option takes into account the declining trend in potting surveys, including within key BCO 3 commercial areas. The allowance for other sources of fishing related mortality would be set at 10 tonnes under this option.

7. The deemed value regime for BCO 3 is also proposed to be changed to better reflect the current nature of the fishery.
8. Fisheries New Zealand welcomes your input and views on the proposed TAC, allowances, and TACC options and review of deemed values for BCO 3.

3 About the stock

3.1 Biology

9. Blue cod is a bottom dwelling species endemic to New Zealand. It can be caught from a few metres depth to about 150 m across a range of habitats including reef edges, shingle/gravel, biogenic reefs, or sandy bottoms close to rocky outcrops. It is most common south of Cook Strait. Blue cod is categorised as a low productivity species and is relatively long lived with a maximum age of 32 years. Generally, blue cod exhibit a constrained home range and are, therefore, susceptible to localised depletion.

3.2 Fishery characteristics

10. BCO 3 is an important domestic commercial fishery, and a key recreational and customary fishery. It is the largest recreational blue cod fishery with recreational catch estimated at approximately 100 tonnes at the time of the last National Panel Survey of Marine Recreational Fishers in 2017–18.
11. In 2020, under the National Blue Cod Strategy, the recreational daily limit was reduced in accordance with a traffic light system,¹ and the minimum legal size was increased to 33 cm. Both recreational and commercial cod pots now also have a larger minimum mesh size of 54 mm set to allow undersize blue cod to escape. These measures were in response to declining trends in potting surveys and other information used to monitor the fishery.
12. The traffic light system has resulted in BCO 3 having four different daily limits covering five separate management areas, as well as a low daily limit of two blue cod within the four taiāpure areas within BCO 3. Under this system the area from the Hurunui River south to the Rakaia River has also been designated 'red' with a recreational daily limit of only two blue cod. Commercial targeting of blue cod does not generally occur in these 'red' areas and Fisheries New Zealand is working with commercial fishers to ensure this continues to be the case.

¹ The traffic light system assigns a colour rating to fine scale areas in the South Island and the Chatham Islands. The rating can be changed as available information suggests stock health is improving or declining.

4 Quota Management System

13. BCO 3 entered the QMS in 1986, with a TACC set under the Fisheries Act 1983 of 162.732 tonnes (following quota appeals). No TAC or allowances were set under the 1983 Act. As the TACC has not been reviewed since then BCO 3 does not have a TAC or allowances for Māori customary non-commercial fishing, recreational fishing or all other mortality to the stock caused by fishing.
14. For more information about the QMS go to <https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>.

5 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.mpi.govt.nz/dmsdocument/45235> for more information.

6 Treaty of Waitangi obligations

6.1 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 describes 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. Te Waka a Māui me Ōna Toka Iwi Forum (the forum) is the South Island iwi fisheries forum — it includes all nine tangata whenua Iwi of Te Wai Pounamu.
18. At the 19 March 2021 hui, Fisheries New Zealand sought the forum's input into the BCO 3 review. The forum advised that Ngai Tahu is the iwi with mana moana over BCO 3 and undertook to provide feedback by the end of April. This advice was that a review of BCO 3 was a high priority, and that a 20 tonne allowance should be used for Māori customary non-commercial harvest in the consultation document, so that wider consultation with individual Tāngata Tiaki in the BCO 3 area could be undertaken.

6.2 Kaitiakitanga

19. Information provided by forums, and iwi views on the management of fisheries resources and fish stocks, as set out in Iwi Fisheries Plans, are the way that tangata whenua exercise kaitiakitanga in respect of fish stocks.
20. Rawaru (blue cod) is identified as a taonga species in the Te Waipounamu Iwi Forum Fisheries Plan. The Forum Fisheries Plan contains objectives to support and provide for the interests of South Island iwi, including the following which are relevant to the options proposed in this paper:
 - **Management objective 1:** To create thriving customary non-commercial fisheries that support the cultural wellbeing of South Island iwi and whanau;
 - **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; and

- **Management objective 5:** to restore, maintain and enhance the mauri and wairua of fisheries throughout the South Island.

21. Fisheries New Zealand considers that this review contributes to all these Management objectives. Table 1 also lists the customary fisheries areas that fall within BCO 3.

Table 1: Customary fisheries areas within BCO 3.

Location	Management Type
East Otago Taiāpure Akaroa Harbour Taiāpure Oaro-Haumuri Taiāpure Te Taumanu o Te Waka a Māui Taiāpure	Taiāpure <i>All types of fishing are permitted within a Taiāpure. The management committee can recommend regulations to manage commercial, recreational and customary fishing.</i>
Waikawa Harbour/Tumu Toka Mātaitai Puna-wai-Toriki Mātaitai Otakou Mātaitai Moeraki Mātaitai Tuhawaiki Mātaitai Te Ahi Tarakihi Mātaitai Waitarakao Mātaitai Te Kaio Mātaitai Koukourarata Mātaitai Lyttelton Harbour/Whakaraupō Mātaitai Rāpaki Bay Mātaitai Kahutara Mātaitai Te Waha o te Marangai Mātaitai Mangamaunu Mātaitai	Mātaitai Reserve <i>Commercial fishing is not permitted within mātaitai reserves unless bylawss state otherwise.</i>
Waiopuka Rahui	Section 186B Temporary Closure of fisheries

22. The proposals in this paper, which aim to generally increase blue cod biomass, are likely to also increase the health of blue cod stocks in these customary fisheries areas.

7 Relevant plans, strategies, statements and context

7.1 National Blue Cod Strategy

23. Concerns about overfishing, the biological characteristics of blue cod, and the high value of blue cod to all fishing sectors (Māori customary, commercial and recreational) led to the development of the [National Blue Cod Strategy](#). Management objectives for the fishery are set out in the strategy and prioritise research and assessment of BCO 3, and setting a TAC and allowances for BCO 3 (as recommended in this paper).
24. Recent measures already implemented in BCO 3 as part of the strategy include introducing the traffic light system of daily limits to manage localised depletion. This has reduced recreational daily limits to 15, 10 or two, depending on the degree of depletion within an area (previously the daily limit was up to 30). An increased minimum legal size of 33 cm and standardised cod pot mesh size of a minimum 54 mm for both recreational and commercial fishers have also been implemented under the strategy.

7.2 Draft National Inshore Finfish Fisheries Plan

25. BCO 3 will also be managed under the [National Inshore Finfish Fisheries Plan](#) once finalised. The Plan outlines the management objectives and strategies for finfish fisheries for the next five years and was consulted on in early 2020.
26. The Plan is aimed at progressing New Zealand towards ecosystem-based fisheries management. Stocks are grouped within the Plan, with management approaches and objectives tailored accordingly for each group.
27. Within the Plan BCO 3 is a Group 2 stock. Group 2 stocks provide moderate levels of benefit to fishers, which vary between sectors and regions. They are managed to provide for moderate levels of use, with moderate levels of information to monitor their status. These stocks are monitored with partial quantitative stock assessments, compared against trends over time. The monitoring and assessment regime does not provide future population (biomass) projections.

7.3 Kaikoura Marine Strategy

28. The Kaikōura Marine Strategy is developed under the Kaikōura (Te Tai ō Marokura) Marine Management Act 2014 and aims to integrate and establish marine protection and fisheries measures in the Kaikōura marine environment.
29. Fisheries New Zealand considers that the proposed management options presented here are in keeping with this Strategy.

7.4 Regional Plans

30. There are three Regional Councils that have coastline within the BCO 3 boundaries. Each of these has multiple plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats.
31. Fisheries New Zealand considers that the management options presented are in keeping with the objectives of relevant regional plans, which generally relate to the maintenance of healthy and sustainable ecosystems to provide for the needs of current and future generations.

7.5 Te Mana o te Taiao (Aotearoa New Zealand Biodiversity Strategy)

32. [Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy](#) sets a strategic direction for the protection, restoration and sustainable use of biodiversity, particularly indigenous biodiversity, in Aotearoa New Zealand. The Strategy sets a number of objectives across three timeframes. The most relevant to setting sustainability measures for BCO 3 are objectives 10 and 12:

Objective 10: Ecosystems and species are protected, restored, resilient and connected from mountain tops to ocean depths.

Objective 12: Natural resources are managed sustainably

33. The Ministry for Primary Industries (MPI) is undertaking work to define specific terms used in the Strategy (e.g. 'environmental limits'), but is required by the Fisheries Act to manage fisheries to balance use and sustainability, including the requirement to avoid, remedy or mitigate adverse effects on the aquatic environment. The Ecosystem Interactions section in this paper provides information on relevant interactions with the wider aquatic environment for this stock.

8 Recent catch levels and trends

8.1 Commercial

34. From 2002–03 to 2017–18, commercial catches in BCO 3 have exceeded the TACC by, on average, 5% (Figure 2).

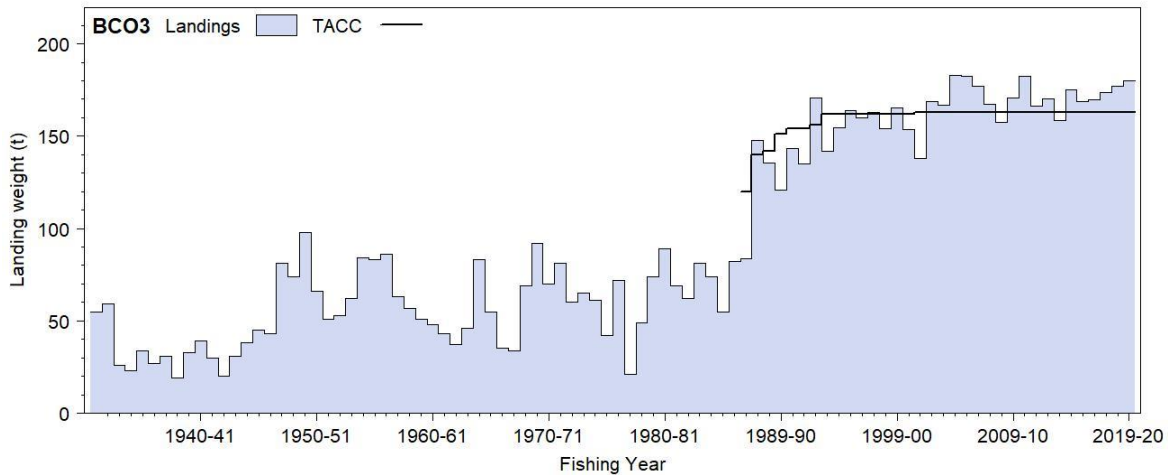


Figure 2: Annual Commercial Landings for BCO 3 (in tonnes).

35. While recreational fishing occurs across the length of BCO 3 (from Kaikoura to the Catlins), the majority (72%) of commercial catch is taken below the Waitaki River in statistical areas 024 (Otago) and 026 (Catlins - Figure 3). There is a small target fishery in Statistical Area 018 with the remainder taken as bycatch from the inshore trawl fishery.
36. The majority of commercially landed blue cod in BCO 3 is caught by target cod potting (67%) (see Figure 3) or bycatch (22%) from the flatfish, red cod and tarakihi bottom trawl target fisheries spread throughout the QMA.

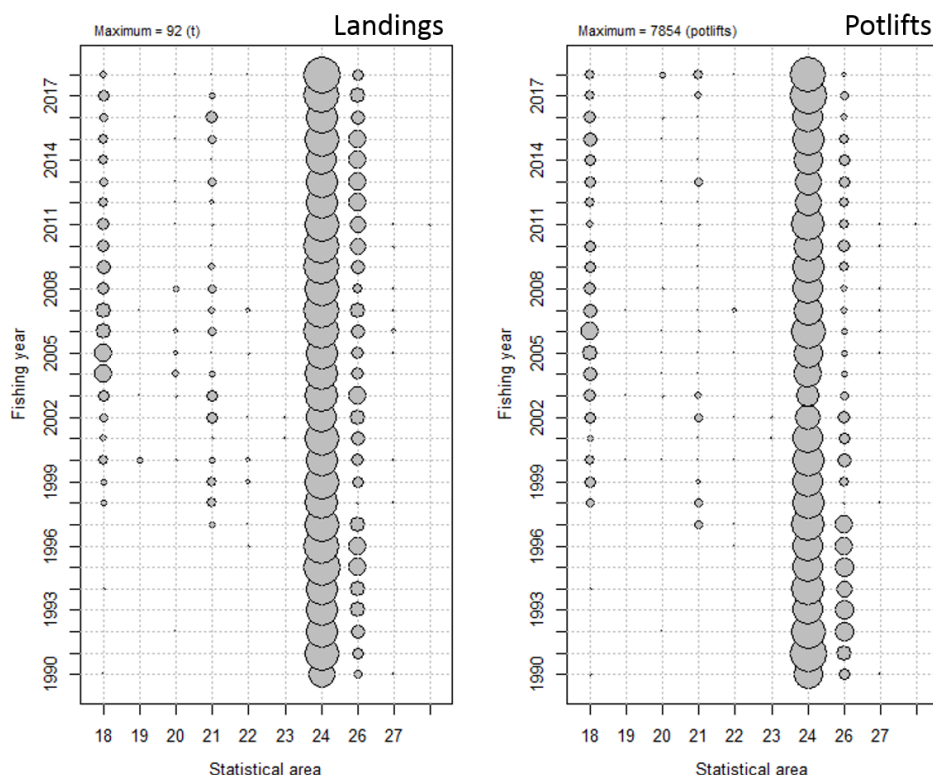


Figure 3: Distribution of landings and number of potlifts for the cod potting method by statistical area and fishing year from trips which landed BCO 3. Circles are proportional within each panel: [landings] largest circle = 92 t in 2011 for 024; [number potlifts] largest circle = 7854 pots in 2006 for 024.

8.2 Customary Māori

37. Customary catch in BCO 3 is managed under the Fisheries (South Island Customary Fishing) Regulations 1999. Little customary catch has been reported under these regulations which indicates tangata whenua have been meeting their needs through the recreational allowance, and have adopted a cautious approach to managing catch, given their concerns about the fishery. As the previous recreational blue cod daily limit of 30 has been reduced to 15 or less, Fisheries New Zealand expects that the reported customary catch may increase from this year-on.

8.3 Recreational

38. Blue cod is the third most common recreational species caught in New Zealand. The [National Panel Survey of Marine Recreational Fishers \(NPS\) conducted in 2017–18](#) estimated a total catch of 292 tonnes (nearly 600 000 fish) for the species, nationally. With 34% of the total blue cod recreational catch, BCO 3 had the largest recreational catch of any QMA.
39. The NPS in 2017/18 estimated recreational catch of BCO 3 at 99 tonnes, while the 2011/12 panel survey gave an estimate of 101 tonnes. Added to this, recreational catch under section 111² approvals were five tonnes, suggesting an estimated 104 tonnes of recreational catch at that time.

Table 2: Recreational harvest estimates for BCO 3.

Year	Method	Number of fish	Total weight (t)	CV (t)
2011/12	Panel Survey	212 184	101	±20 tonnes
2017/18	Panel Survey	202 765	99	±18 tonnes

² Section 111 of the Fisheries Act 1996 enables commercial fishers to take a recreational catch for their own consumption.

40. Fisheries New Zealand notes that since the National Panel Survey was undertaken (2017/18), there have been reductions in daily limits for blue cod across BCO 3. These changes should reduce recreational harvest in BCO 3. Further, the minimum size has also been increased and this may also reduce the level of harvest in the short term.
41. The allowance proposed under both options in this paper for recreational fishing is, therefore, proposed to be lower (by 20%) than the 2017/18 estimate to take this into account. Noting there is no quantitative data yet available, the next National Panel Survey of recreational fishing scheduled for 2022/23 will allow an opportunity to assess new estimates of recreational harvest and the appropriateness of this allowance.

9 Status of the stock

42. The best available information on the status of the BCO 3 fishery is the [May 2021 Fisheries Assessment Plenary report](#), along with the potting survey series and catch information.
43. Because of its low productivity the default target recommended for blue cod under the [Harvest Strategy Standard](#) is an F_{MSY} of $F_{45\%SPR}$ ³. This is the fishing mortality corresponding to a spawning biomass of 45% B_0 . The Inshore Science Working Group concluded the commercial stock status in relation to the target B_{MSY} proxy ($F_{45\%SPR}$) is currently unknown. This is because the standardised commercial CPUE series previously used to monitor the fish stock was considered unreliable as it did not account for a change in pot mesh size (38 mm to 48 mm) in 2009. The status in relation to whether overfishing is occurring is also unknown.
44. The 2021 Plenary report concluded, however, that the biomass was unlikely (<40%) to be below the soft limit, and very unlikely (<10%) to be below the hard limit.
45. The potting surveys undertaken at Kaikoura, Motunau, Banks Peninsula, north Otago and south Otago are primarily designed to monitor the recreational fishery. They are generally carried out every four years and provide data that can be used to assess local abundance, size, age, and sex structure of these geographically separate blue cod populations.
46. The surveys can also provide a measure of the response of populations to changes in fishing pressure and management initiatives such as changes to the daily limit, minimum legal size, and area closures. In the case of the north Otago and south Otago series, where most of the commercial catch is taken, there is good overlap between the survey areas and the commercial target potting fishery.
47. The surveys generally show a 15 to 20-year decline in relative abundance across all potting survey areas in BCO 3; by as much as 50% in some areas. The north Otago and south Otago potting surveys each have two indices of relative abundance based on the random survey design, both of which have exhibited substantial declines between 2013 and 2018, particularly that for south Otago. Earlier fixed station surveys also showed a decline for north Otago.

³ $F_{45\%SPR}$ or percentage spawner per recruit ratio. An *SPR* ratio estimate indicates the expected contribution to the spawning biomass over the lifetime of an average recruit.

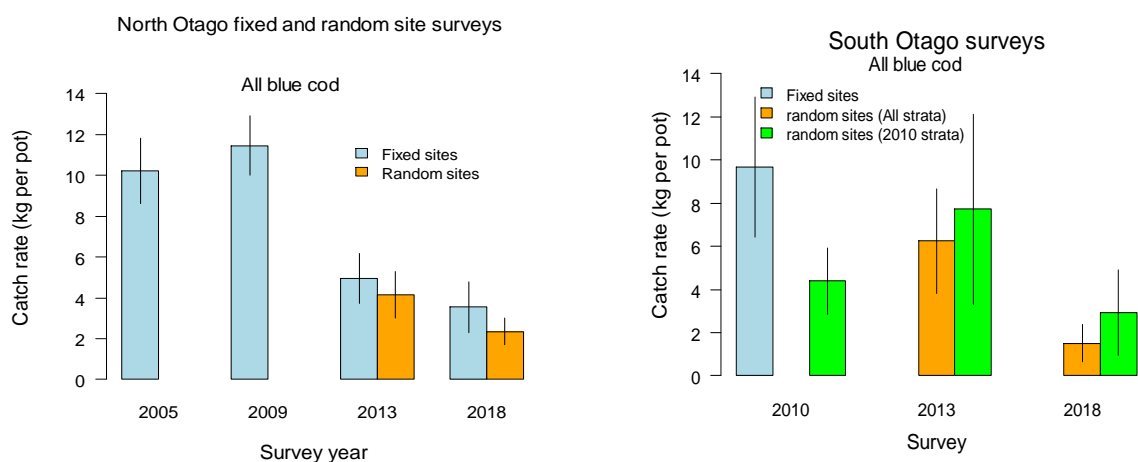


Figure 4: Historical Stock Status Trajectory and Current Status. North Otago and South Otago fixed-site and random-site potting survey catch rates of all blue cod by survey year. Error bars are 95% confidence intervals. Note that the fixed site and random site surveys are not directly comparable.

48. Fishing mortality can be assessed based on the age structure of blue cod from these surveys. And suggest fishing mortality may be greater than the target ($F_{45\%SPR}$). For the north Otago survey area this suggests a spawning biomass of 30% B_0 and 34% B_0 for the south Otago survey area.
49. The Inshore Fisheries Working Group concluded that the information used in these estimates was too uncertain to draw conclusions on status relative to both the management target and the overfishing threshold, which were, therefore, designated as unknown. A key reason for the uncertainty is that the estimates were based on data from a single survey in each area.
50. The Working Group did, however, consider that the estimates of 30% B_0 and 34% B_0 were sufficiently above the soft and hard limits of 10% B_0 and 20% B_0 to be confident that the stock was not breaching these limits.

10 Current and proposed TAC, TACC and allowance settings

Table 3: Summary of current and proposed catch settings for BCO 3 from 1 October 2021. Figures are in tonnes.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings (<i>status quo</i>)	-	162.732	-	-	-
Option 1 (<i>Set a TAC & allowances</i>)	277.732	162.732	20	83	12
Option 2	243 ↓	130 ↓ (32.732 t)	20	83	10 ↓

51. Fisheries New Zealand invites views on the proposed TAC, TACC and allowances.

10.1 Option 1

10.1.1 Total Allowable Catch

52. The *status quo* is a stand-alone TACC of 162.732 tonnes. This TACC was set under the Fisheries Act 1983 prior to the requirement for a TAC and allowances under the Fisheries Act 1996.

53. Option 1 proposes setting a TAC that retains the current TACC and sets allowances. The option assumes that, while the stock status relative to the management target is unknown, the commercial fishery is stable at the current level of fishing and that the current TACC is appropriate.
54. This option also takes into account that the relevant science working group has concluded BCO 3 is unlikely to be below the soft or hard limits set for the fishery. In addition, the measures put in place for the fishery in 2020, including increases in commercial pot mesh size, are anticipated to increase survivorship of undersize cod and improve the productivity of the fishery.
55. The allowances have been estimated using the best available information, including discussions with tangata whenua and fishers as set out below.

10.1.2 Allowances

Māori Customary

56. Little Māori customary non-commercial catch has been reported to-date. Given the reduced recreational blue cod daily limits now in place, however, Fisheries New Zealand expects that the reported customary catch will increase. Iwi have suggested a figure of 20 tonnes is reflective of their needs and likely take. Based on this information an allowance for customary catch of 20 tonnes is proposed.

Recreational

57. As noted, the most reliable estimate of recreational harvest comes from 2017/18 National Panel Survey, which estimated that 99 tonnes were taken across BCO 3 between 1 October 2017 and 30 October 2018. The same survey methods were also employed in 2011/12 and gave an estimate of 101 tonnes. While these estimates across the six-year interval are similar, the amount of recreational fishing effort is likely to vary from year to year depending on factors such as weather. After combining the NPS 2017/18 estimate and the average of the s.111 landings, this equates to 104 tonnes.
58. Since the 2017/18 National Panel Survey was carried out the traffic light system has differentially reduced the recreational daily limit across BCO 3. Further, the recreational minimum size limit has been increased in some areas from 30 cm to 33 cm.
59. Data on the impact of these changes on overall recreational catch in BCO 3 will not be available until after the next National Panel Survey scheduled for 2022/23. In the interim, it is proposed to assume recreational catch will have decreased by approximately 20%, relative to the last survey, and to set a recreational allowance of 83 tonnes until a more informed review can be undertaken.
60. Fisheries New Zealand welcomes submissions on this proposal.

All other mortality to the stock caused by fishing

61. The allowance for all other sources of stock mortality caused by fishing is proposed to be set at 12 tonnes.
62. This estimate takes into account the use of blue cod as bait and uncertainty regarding survival of blue cod that are returned to the sea. This includes fishing practices that do not quickly return undersize blue cod to the water and result in poor survivability and also predation of returned fish, especially by mollymawks and albatross. An observed decrease in the average size of blue cod in the surveyed recreational areas coupled with an increase in recreational minimum legal size indicates there may be a significant increase in the number of undersize recreational fish returned to the water. On the other hand, the recent increase in cod pot mesh size (48 mm to 54 mm) as part of the National Blue Cod Strategy is expected to have facilitated escapement of undersized blue cod.
63. Taking this information into account Fisheries New Zealand recommends an allowance for other sources of mortality be set for BCO 3 at approximately 5% of the combined recreational

allowance and the TACC. This is similar to that set for BCO 4 (Chatham Islands) when that stock was reviewed earlier this year.

64. Feedback during consultation is sought to confirm the appropriateness of this allowance.

10.1.3 Total Allowable Commercial Catch

65. Under Option 1 there is no change to the TACC. As noted above the science working group concluded that the stock status in relation to target is unknown. Whether overfishing is occurring is also unknown. Given that the estimated spawner per recruit ratios are based on data from a single survey in each area, the working group concluded that this information has high levels of uncertainty.

10.2 Option 2

10.2.1 Total Allowable Catch

66. Option 2 is a more cautious approach that places weight on the uncertainty of the assessment and that the status in relation to the management target and whether overfishing is occurring are both unknown. It also takes into account the information suggesting declining abundance from the five potting surveys. Over the series, these surveys indicate a significant decline in the abundance of blue cod in the survey areas and that these areas could be overfished.
67. Fisheries New Zealand also notes the overlap with the commercial target potting fishery in north Otago and south Otago where most of the target fishery is caught, and that the best available information indicates these fishery areas could also be overfished.

10.2.2 Allowances

68. Option 2 sets the same allowances as Option 1.

10.2.3 Total Allowable Commercial Catch

69. The majority of the commercial catch is taken from Statistical Areas 024 and 026. The north Otago and south Otago potting surveys each have two indices of relative abundance based on the random survey design, both of which have exhibited substantial declines between 2013 and 2018.
70. The 2018 north Otago random-site survey spawner-biomass-per-recruit ratio was 30%, indicating that the level of exploitation ($F_{30\%SPR}$) of north Otago blue cod stocks was above the F_{MSY} target reference point of $F_{45\%SPR}$, and that overfishing was occurring⁴.
71. The 2018 south Otago random-site survey spawner-biomass-per-recruit ratio was 34%, indicating that the level of exploitation ($F_{34\%SPR}$) of south Otago blue cod stocks was also above the F_{MSY} target reference point of $F_{45\%SPR}$, and that overfishing was occurring.
72. Further, Fisheries New Zealand notes the sex ratio for north and south Otago was 87% male and 68% male respectively. A preponderance of males is thought to indicate high fishing intensity.
73. Accordingly, this option would reduce the TACC by 20% from 162.732 to 130 tonnes.

11 Environmental interactions

74. Over two thirds of BCO 3 commercial catches are taken in a target cod-potting fishery which has very little interaction with other species. Most of the remaining BCO 3 catch is taken in the inshore bottom trawl fishery operating on the east coast of the South Island, largely directed at

⁴ This means that at the 2018 levels of fishing mortality, over the lifetime of an average recruit, the expected contribution to the spawning biomass is reduced to 30% of the contribution in the absence of fishing.

flatfish, red cod and tarakihi. Any environmental interactions from trawl bycatch vessels is most appropriately discussed under those target fisheries. The changes proposed in this paper will not increase any environmental interactions arising from the BCO 3 fishery.

11.1 Marine Mammals

75. There have been no recorded interactions with marine mammals in this fishery, given the primary method is potting and fishers are largely in attendance with little chance of entanglement.

11.2 Seabirds

76. There have been no recorded interactions with seabirds in this fishery, given the primary method is potting, with pots usually set too deep for seabirds to enter.

11.3 Fish bycatch

77. Bycatch species sometimes taken include conger eel, octopus, sea perch, wrasse and blue moki.

11.4 Benthic impacts

78. Given the primary method is potting, benthic impacts or interactions are considered minimal. Pots are only set for an hour or so.

11.5 Habitats of particular significance

79. Blue cod occupy a wide number of benthic substrates over a wide latitudinal and depth range. Their broad distribution in inshore waters makes it difficult to identify specific areas of particular significance to the species. Some general habitats that could be regarded as particularly significant to BCO 3 are discussed in Table 4 below.

Table 4: Summary of information on habitats of significance for BCO 3.

Fish Stock	BCO 3
Habitat	<p>Spawning: Spawning areas are widespread throughout much of New Zealand, including in BCO 3. Running ripe cod are found throughout the fishery, however, some consider blue cod might spawn towards the edge of the continental shelf.</p> <p>Juvenile: Information suggests they inhabit ground that is complex such as shell or rubble, or cryptic habitat with epifauna (bryozoans, sponges, etc) is important for juveniles to escape predation and improve survival.</p>
Attributes of habitat	<ul style="list-style-type: none"> Juvenile habitats are likely to provide shelter and protection from predation and harvesting, and suitable food while growth and development proceeds.
Reasons for particular significance	<ul style="list-style-type: none"> Successful spawning and development through juvenile stages is critical to supporting the productivity of the stock and ensuring juveniles recruit into the fishery.
Risks/Threats	<ul style="list-style-type: none"> Changes in water temperature and water circulation could impact spawning and egg/larval development. Land-based impacts on habitats with benthic structure and aquatic plants that provide juvenile habitat. Benthic impacting activities, such as trawling and dredging could disrupt habitat.
Existing protection measures	<ul style="list-style-type: none"> Hikurangi, Flea Bay and Akaroa marine reserves each has a small area of habitat that would support blue cod.

12 Uncertainties and risks

80. From 1 July 2020 the minimum mesh size for blue cod pots in BCO 3 was increased from 48 mm to 54 mm (some of the fleet had begun transitioning their pots in 2018/19). The larger sized mesh was shown to reduce the capture portion of undersize blue cod (< 33 cm) from 11% to 2% while causing minimal change to the legal catch proportions. Therefore, the change is anticipated to promote both productivity and recruitment of the fishery, plus an anticipated recruitment pulse after two years⁵. The implications of the changes associated with the increase in mesh diameter have not been considered.
81. The degree of overlap between the potting surveys and the extent of the commercial fisheries and the stock needs further investigation.
82. There is some uncertainty around the interpretation of the CPUE data and hence the conclusions drawn about the state of the fishery. In this regard, Fisheries New Zealand notes that there will be a further Recreational National Panel Survey in 2023 and the Medium Term Research Plan has potting surveys for north and south Otago scheduled for the same year.

13 Deemed values

83. Deemed values are the price paid by fishers for each kilogram of unprocessed fish landed in excess of a fisher's Annual Catch Entitlement (ACE) holdings. The purpose of the deemed values regime is to provide incentives for individual fishers to acquire or maintain sufficient ACE to cover catch taken over the course of the year, while allowing flexibility in the timing of balancing, promoting efficiency, and encouraging accurate catch reporting.
84. [The Deemed Value Guidelines](#) set out the operational policy Fisheries New Zealand uses to inform the development of advice to the Minister on the setting of deemed values.
85. The following criteria will be used to determine which stocks enter the Review Process each year;
 - Catch has exceeded the available ACE (either at the level of the stock, or the individual operator);
 - Significant changes in the economic characteristics of the fishery (e.g. landed price, market ACE value); or
 - The current deemed value rates are inconsistent with these Guidelines
86. The BCO 3 commercial fishery has been overcaught by an average of 6% over the previous 10 years (11% last fishing year). Both the port price and the ACE price have also increased over this period.
87. The Commercial Catch Balancing Forum, at the December 2020 meeting, agreed BCO 3 had met the criteria of catch exceeding available ACE. Industry members felt it would be appropriate to consider increasing the deemed value rates for BCO 3 with the same stringent ramping, noting that the interim and 100-110% rates were the key to get the setting correct.
88. Fisheries New Zealand notes that 22% of catch is taken as bycatch of the inshore trawl fishery while ACE is often secured early in the fishing year for the target potting fishery.
89. The average price paid by fishers during the 2019/20 fishing year for one kilogram of BCO 3 ACE was \$3.71. The 2019/20 port price index of BCO 3 was \$7.36/kg. Fisheries New Zealand notes that most of the larger actual transfers were made at \$4.00/kg. The deemed value rates for BCO 3, including the proposed rates for 1 October 2021, are shown in Table 5.

⁵ Review of Blue Cod (BCO 4) pot mesh size. June 2017. MPI Decision Paper 2017/19.

Table 5: Deemed value rates for BCO 3 from 1 October 2020 and proposed new rates for 1 October 2021.

Stock	Interim	Annual 100-110%	Differential rates (\$/kg) for excess catch (% of ACE)				
			110-120%	120-130%	130-140%	140-150%	>150%
BCO 3	3.38	3.75	4.50	5.25	6.00	6.75	7.50
Proposed rates	4.05	4.50	5.25	6.00	6.75	7.50	8.25

90. Fisheries New Zealand seeks feedback on the proposed deemed value rates for 1 October 2021.

14 Questions for submitters on options for varying TACs, TACCs and allowances

- Which option do you support for setting the TAC and allowances? Why?
- If you do not support any of the options listed, what alternative(s) should be considered? Why?
- Are the allowances for customary Māori, recreational and other sources of mortality appropriate? Why?
- Has the way you fish changed or are you travelling further because it is harder to catch blue cod?
- Are the proposed new deemed value rates appropriate?
- Do you think these options adequately provide for social, economic, and cultural wellbeing?
- Do you have any concerns about potential impacts of the proposed options on the aquatic environment?

91. We welcome your views on these proposals. Please provide detailed information and sources to support your views where possible.

15 How to get more information and have your say

92. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 27 July 2021.

93. Please see the Fisheries New Zealand sustainability consultation webpage (<https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-2021-october-round>) 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.

16 Referenced reports

- Beentjes, M P; Fenwick, M (2019a) Relative abundance, size and age structure, and stock status of blue cod off north Otago in 2018. *New Zealand Fisheries Assessment Report 2019/07*.
- Beentjes, M P; Fenwick, M (2019b) Relative abundance, size and age structure, and stock status of blue cod off south Otago in 2018. *New Zealand Fisheries Assessment Report 2019/14*.
- Fisheries New Zealand (2011). Operational Guidelines for New Zealand's Harvest Strategy Standard. Accessible at: <https://www.mpi.govt.nz/dmsdocument/19706-OPERATIONAL-GUIDELINES-FOR-NEW-ZEALANDS-HARVEST-STRATEGY-STANDARD>
- Fisheries New Zealand (2018). National Blue Cod Strategy. Accessible at: <https://www.mpi.govt.nz/fishing-aquaculture/sustainable-fisheries/national-blue-cod-strategy/>
- Fisheries New Zealand (2019). Draft National Inshore Finfish Fisheries Plan. Accessible at: <https://www.mpi.govt.nz/consultations/draft-national-inshore-fish-fisheries-plan/>
- Fisheries New Zealand (2020). Guidelines for the review of deemed value rates for stocks managed under the Quota Management System. Accessible at: <https://www.mpi.govt.nz/dmsdocument/40250/direct>
- Fisheries New Zealand (2021). Fisheries Assessment Plenary, May 2021: stock assessments and stock status. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. Accessible at: <https://www.mpi.govt.nz/science/fisheries-science-research/about-our-fisheries-research>
- New Zealand Government (2020). Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020. Accessible at: <https://www.doc.govt.nz/nature/biodiversity/aotearoa-new-zealand-biodiversity-strategy/>
- Wynne-Jones, J.; Gray, A.; Heinemann, A.; Hill, L.; Walton, L. (2019). National Panel Survey of Marine Recreational Fishers 2017-2018. *New Zealand Fisheries Assessment Report 2019/24*. 104p. Accessible at: <https://www.mpi.govt.nz/dmsdocument/36792-far-201924-national-panel-survey-of-marine-recreational-fishers-201718>