Fisheries New Zealand
Tini a Tangaroa

Review of Sustainability Measures for the 2021 April round

Fisheries New Zealand Decision Paper

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Contents

1 Introduction

1. This paper seeks your decisions in relation to the April 2021 Sustainability Review. You are asked to make decisions on sustainability measures and catch settings for a selected number of fishstocks to be implemented for the 1 April 2021 and 1 October 2021 fishing years.

2. The catch settings you are asked to consider for these stocks are:

   - setting or varying the Total Allowable Catch (TAC);
   - setting or varying allowances for Māori customary catch and recreational catch, and allowances for other sources of mortality to stocks from fishing; and
   - setting or varying the Total Allowable Commercial Catch (TACC).

3. This paper also seeks your decision on a proposed year-round closure to the harvest of shellfish in Cockle Bay (Hauraki Gulf Coast, Auckland), as a sustainability measure under section 11 of the Fisheries Act 1996.

4. Your decisions on sustainability measures for fishstocks will take effect on 1 April 2021 (for April year stocks) or 1 October 2021 (for October year stocks). Your decision on the proposed three-year closure to shellfish harvest in Cockle Bay would come into effect on 1 May 2021 if implemented (this is the start of the open season, which runs from 1 May to 30 September).

5. The fishstocks proposed for changes as part of the April 2021 Sustainability Review are listed below in Table 1:

Table 1: Summary of stocks reviewed in the April 2021 Sustainability Round

Stocks reviewed for the 1 April 2021 fishing year	
Inshore stocks	**Deepwater stocks**
• **Red rock lobster** (CRA 1, 3, 4 & 5 - Northland, Gisborne, Wellington / Hawke's Bay, Canterbury / Marlborough) • **Packhorse rock lobster** (PHC 1 - All of New Zealand)	• **Giant spider crab** (GSC 3, 5 & 6A - Chatham Rise, South East Coast, Southland)
Stocks reviewed for the 1 October 2021 fishing year	
Inshore stocks	
• **Blue cod** (BCO 4 – Chatham Islands) • **Yellow-eyed mullet** (YEM 9 - Waikato, West Coast of Auckland and Northland) • **Dark ghost Shark** (GSH 1 - East Coast of Northland and Auckland, Bay of Plenty)	• **Elephant fish** (ELE 7 – West Coast and Top of South Island • **Flatfish** (FLA 2 - East Cape, Hawke's Bay, Wellington and Taranaki) • **Giant stargazer** (STA 1 - Waikato, East / West Coasts of Auckland and Northland, Bay of Plenty)
Other sustainability measures reviewed	
• A year-round closure to the harvest of **shellfish in Cockle Bay** (Hauraki Gulf Coast, Auckland), to be reviewed after three years	

6. This decision document provides you with Fisheries New Zealand's final advice on proposals for all fishstocks and sustainability measures excluding rock lobster stocks. The final advice on proposals for rock lobster stocks is provided to you in a separate National Rock Lobster Management Group (NRLMG) decision document.

7. We have consulted on all these proposals with representatives of people who have an interest in the stocks or the effects of fishing on the aquatic environment in the areas concerned, including Māori, environmental, commercial, and recreational interests.

8. We have provided for input and participation of tangata whenua on these decisions, primarily through Iwi Fisheries Forums, which have been set up for this purpose. We have identified species and areas over which these groups have expressed kaitiakitanga, to which you must have particular regard when making these decisions.

9. Public submissions have been summarised within each relevant stock chapter of this decision document. However, should you wish to view any submissions received on the April 2021 sustainability round proposals, a full copy has been provided to your office and is available to you as a separate book.

2 Overview of powers and obligations under the Fisheries Act 1996

2.1 Decisions Ministers may make in relation to sustainability reviews

10. Provisions of the Fisheries Act 1996 allow you as Minister for Oceans and Fisheries to:

Part 3: Sustainability measures

- Set and vary sustainability measures such as the Total Allowable Catch (TAC).

Part 4: Quota Management System

- Set and vary the Total Allowable Commercial Catch (TACC) within the limits of the TAC having allowed for Māori customary and recreational fishing and all other mortality to the stock caused by fishing.

- Set deemed value rates to provide an incentive for fishers not to exceed the available annual catch entitlement (ACE).

11. In making decisions on those matters there are several things you are required to do and take account of.

2.2 Overarching requirements

12. Section 5: You must act in a manner consistent with New Zealand's International obligations relating to fishing, and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

13. Section 8: The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability.

- "Ensuring sustainability" is defined as: "maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment".

- "Utilisation" of fisheries resources is defined as "conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing."

14. The Supreme Court has stated that the purpose statement incorporates "the two competing social policies reflected in the Act" and that "both policies are to be accommodated as far as is practicable in the administration of fisheries under the quota management system. In the attribution of due weight to each policy that given to utilisation must not be such as to jeopardise sustainability".

15. Section 9: you must take into account the following environmental principles:
    (a) associated or dependent species should be maintained above a level that ensures their long-term viability
    (b) biological diversity of the aquatic environment should be maintained
    (c) habitat of particular significance for fisheries management should be protected.

16. Section 10: you must take into account the following information principles:
    (a) decisions should be based on the best available information
    (b) decision makers should consider any uncertainty in the information available in any case
    (c) decision makers should be cautious when information is uncertain, unreliable, or inadequate
    (d) the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act.

17. Sections 12, 21 and 75A require you to consult before making decisions on sustainability measures, the TACC, and deemed values rates, respectively.

2.3 The Hauraki Gulf Marine Park Act 2000

18. Section 11 of the Fisheries Act (discussed below) requires you to have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (HGMPA) when setting or varying a TAC that includes the area of the Hauraki Gulf as defined in that Act. Section 13 of the HGMPA requires that you have particular regard to sections 7 and 8 of the HGMPA when setting or varying TACCs and deemed values.

19. Section 7 of the HGMPA recognises the national significance of the Hauraki Gulf and section 8 sets out objectives for management of the Gulf.

20. The HGMPA is discussed in stock chapters of decision documents where this is relevant.

2.4 Statutory Considerations

21. Table 2 provides an overview of your central statutory considerations for varying TACs and TACCs under the Fisheries Act 1996 (the Act). Where relevant, stock-specific details relating to these considerations are set out in the stock or multi-stock chapters within this paper.

Table 2: Information on your key requirements when making decisions under the Act.

Decisions you may make	Requirements – things you must do when making decisions
Part 3 Sustainability Measures	
Section 11 You may set or vary sustainability measures for any stock	(1) after taking into account: (a) effects of fishing on any stock and aquatic environment; and (b) existing controls under this Act that apply to the stock or area concerned; and (c) the natural variability of the stock concerned. (2) before setting or varying any sustainability measure, have regard to: (a) any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991; and

Decisions you may make	Requirements – things you must do when making decisions
S11(3) Sustainability measures may relate to (but are not limited to): • Catch limits • Size, sex or biological state • Areas • Fishing methods • Fishing seasons	(b) any management strategy or plan under the Conservation Act 1987; and (c) sections 7-8 of the Hauraki Gulf Marine Park Act 2000; and (ca) regulations made under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012; and (d) a planning document lodged with you by a customary marine title group under s 91 of the Marine and Coastal Area (Takutai Moana) Act 2011 – that apply to the coastal marine area and are considered by you to be relevant. (2A) before setting or varying any sustainability measure, take into account*:* (a) any conservation or fisheries services; and (b) any relevant fisheries plan approved under section 11A; and (c) any decisions not to require conservation or fisheries services.
Section 11A You may approve or revoke fisheries plans	Fisheries plans may include: (a-c) fisheries management objectives, strategies to achieve them, and performance criteria to measure achievement; (d) conservation or fisheries services; or (e) contingency strategies to deal with foreseeable variations in circumstances. To date national fisheries plans have been approved only for deepwater and highly migratory species, the Foveaux Strait oyster fishery and PAU 4 (Chatham Islands).
Section 13 You shall set and may vary, a TAC for stocks in the Quota Management System (QMS)	(2) You shall set (and may vary – s(4)) a TAC that: (a) maintains the stock at or above a level that can produce the maximum sustainable yield (*MSY*), having regard to the interdependence of stocks; or (b) enables the level of any stock below a level that can produce *MSY* to be altered: (i) in a way and at a rate that will restore the stock to a level that can produce *MSY* having regard to the interdependence of stocks; and (ii) within a period appropriate to the stock, having regard to the biological characteristics of the stock and environmental conditions affecting it, or (c) enables the level of any stock above that which can produce *MSY* to be altered in a way and at a rate to move the stock toward or above that which can produce *MSY* having regard to the interdependence of stocks. (2A) If you consider that the stock level to produce *MSY* is not able to be estimated reliably using best available information, you must: (a) not use this as a reason to postpone or fail to set a TAC; and (b) have regard to the interdependence of stocks, biological characteristics of the stock and any environmental conditions affecting the stock; and (c) set a TAC (i) using the best available information; and (ii) that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above a level that can produce *MSY.* (3) In considering the way and rate at which a stock is moved toward or above a level that can produce *MSY* you shall have regard to such social, cultural and economic factors as you consider relevant. (4) You may, by notice in the *Gazette*, vary any total allowable catch set for any quota management stock under this section. When considering any variation, you are to have regard to the matters specified in subsections (2), (2A) (if applicable), and (3).
Part 4 Quota Management System	
Section 20 You shall set and may vary TACC for quota management stocks, unless a TAC has not been set for the stock	**Section 21** You must take the following into account when setting or varying TACC: (1) In setting or varying TACC you shall have regard to the TAC and shall allow for (a)(i) Māori customary interests; and (a)(ii) Recreational interests; and (b) all other mortality to the stock caused by fishing. (2-3) Before setting or varying TACC you shall consult representatives of classes of people that have an interest and give reasons for his/her decision

Decisions you may make	Requirements – things you must do when making decisions
	(4) When allowing for Māori customary interests you must take into account (a) any mātaitai reserve in the QMA declared under s186: (b) any area closure or method restrictions/prohibitions imposed under s186A. (5) When allowing for recreational interests you must take into account any regulations that prohibit or restrict fishing under s311.
Section 75 You must set and may vary interim and annual deemed value rates for each quota management stock	(2) In setting deemed values you: (a) must take into account the need to provide incentive for fishers to acquire or maintain sufficient ACE (b) may have regard to: (i) the desirability of fishers landing catch for which they do not have ACE (ii) the market value of the ACE for the stock (iii) the market value of the stock (iv) the economic benefits obtained by (parties involved in commercial fishing, processing, sale) (v) the extent to which catch has exceeded/is likely to exceed TACC for the stock in any year (vi) any other matters you consider relevant. (3) Annual deemed values must be greater than interim deemed values (4) Different deemed values may be set for different levels of excess catch (5) Different deemed values may be set for the Chatham Islands (6) When setting deemed value rates, you must not: (a) have regard to the personal circumstances of individuals or class of person (b) set separate deemed values in individual cases.

3 Relevant Standards and Guidelines

3.1 Maximum Sustainable Yield

22. As noted above in Table 2, section 13 of the Act requires you to set a stock's TAC at a level that maintains the stock at or above a level that can produce the Maximum Sustainable Yield (*MSY*).

23. The *MSY* of a stock is the largest long-term average catch or yield that can be taken without impairing the stock's renewability through natural growth and reproduction (under prevailing ecological and environmental conditions). There are a number of factors that contribute to the determination of a stock's *MSY*, including how fast the species grows, when and how they reproduce and the pattern of harvesting in the fishery. Typically, *MSY* for a fish stock is also variable over time, because of changes in productivity and environmental factors.

24. In general, scientific working groups will estimate *MSY*-compatible reference points for stocks based on best available information, and management working groups will set fishery or stock targets that consider these estimates as an input.

25. In the context of this review there are a number of stocks for which *MSY* is not able to be estimated due to a lack of available scientific information. Proposals for changes in catch limits have been based primarily on an assessment of trends in catch and are considered to be not inconsistent with the objective of maintaining the stock at or above levels that can produce *MSY* as provided for by s13 (2A) of the Act.

3.2 Overview of the Harvest Strategy Standard

26. The Harvest Strategy Standard (HSS) is a policy statement of best practice in relation to the setting of fishery and stock targets and limits for fishstocks in New Zealand's Quota

Management System (QMS). It is intended to provide guidance as to how fisheries law will be applied in practice, by establishing a consistent and transparent framework for decision-making to achieve the objective of providing for utilisation of New Zealand's QMS species while ensuring sustainability.

27. It is important to note that a minimum requirement for satisfying the Harvest Strategy Standard is that fishery or stock targets will be set at the level of *MSY*-compatible reference points (however, they may also exceed this minimum requirement).

28. The HSS outlines the Ministry's approach to relevant sections of the Act. It is therefore a core input to the Ministry's advice to you on the management of fisheries, particularly the setting of TACs under sections 13 and 14.[1]

29. The HSS however is not legally binding and you are not obliged to choose options based upon it.

30. The HSS assists us to decide when a review of sustainability and related settings for a stock may be warranted, by establishing reference points and guidance for the fisheries management responses when stocks are at those reference points. The HSS establishes default targets and limits as a minimum standard (Table 3):

Table 3: Guidelines on default targets as set out in the Harvest Strategy Standard.

Reference point	Default	Management response
Management target	40% unfished biomass (B_0)	Stock permitted to fluctuate around this management target. TAC/TACC changes will be employed to keep the stock around the target (with at least a 50% probability of being at the target).
Soft limit	20% B_0	A formal time constrained rebuilding plan will be implemented if this limit is reached.
Hard limit	10% B_0	The limit below which fisheries will be considered for closure.
Rebuild strategy		Stocks that have fallen below the soft limit should be rebuilt back to at least the target level in a time frame between T_{min} and 2 * T_{min} with an acceptable probability. T_{min} is the number of years to rebuild a stock to the target, in the absence of fishing.

3.3 Deemed Values

31. The QMS implies an obligation for commercial fishers to balance catch with available Annual Catch Entitlement (ACE). Commercial fishers who catch more fish than their ACE are be charged a "deemed value" for the extra catch on a monthly basis. Charges are remitted if and when the fisher acquires ACE during the course of the year.

32. By providing incentives for commercial catch to not exceed the available ACE, deemed values are a key component of the catch balancing regime. As commercial catches of many fish stocks can be hard to accurately predict, the deemed values regime must be sufficiently flexible to provide fishers with a mechanism to deal with unintended and accidental catch in excess of ACE, while providing incentives and constraints to limit over-catch.

33. Deemed values act by providing economic incentives at the level of the individual fisher. If deemed value rates are set too low, fishers may not be incentivised to source available ACE to balance with catch. Such behaviour can lead to catch in excess of available ACE with

[1] Section 14 of the Act outlines alternative TAC settings for stocks specified in Schedule 3. For stocks listed in Schedule 3, the Minister may set a TAC otherwise than in accordance with section 13 if he or she considers that the purpose of the Act would be better achieved by doing so. Note that there are no Schedule 3 stocks included in the current round.

consequential effects on stock sustainability and the value of quota rights. Likewise, deemed value rates set too high may not incentivise fishers to accurately report catch which will have consequent effects on the quality of information available to inform management decisions

34. The Deemed Values Guidelines set out operational policy, including a set of principles to be applied when setting deemed value rates.

4 Input and consultation

4.1 Input and participation of tangata whenua

35. Among other things, section 12 of the Act requires you to provide for the input and participation of tangata whenua who have a non-commercial interest in the stock concerned, or an interest in the effects of fishing on the aquatic environment in the area concerned. You must also have particular regard to kaitiakitanga.

36. Input and participation into the sustainability decision-making process is provided primarily through Iwi Fisheries Forums, which have been established for that purpose. Each Iwi Fisheries Forum has developed (or are in the process of developing) 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 interests in fisheries.

37. Iwi Fisheries Forums were invited to have input into the selection of stocks for review and to submit on proposals to set or vary sustainability measures.

38. The individual stock chapters in this decision document provide specific information about input and participation of tangata whenua and kaitiakitanga in relation to those stocks.

4.2 Consultation process

39. Consultation on the April 2021 Sustainability Round commenced on 9 December 2020 for all stocks except rock lobster, and then on 15 December 2020 for rock lobster stocks.

40. Fisheries New Zealand notified Treaty partners and stakeholders that the consultation documents were available and directed them to consultation pages on the Fisheries New Zealand website. The consultation page had links to each of the consultation papers, and an invitation to provide written submissions on any or all of the proposed changes.

41. Submissions closed at 5.00 pm on 5 February 2021 for all stocks, allowing a total of eight weeks for people to submit on the proposed changes (five working weeks since this period included Christmas and New Year holidays). In total we received 165 submissions during this consultation.

42. Table 4 below gives a summary of all submissions received during consultation in this sustainability round.

43. The Cockle Bay closure proposal received the most submissions, followed by red and packhorse rock lobster proposals (Table 4).

44. More than half of the submissions received were from individuals that did not identify an affiliation to a particular group. However, there were also many submissions received from stakeholders on behalf of representative bodies and organisations.

45. Te Ohu Kaimoana and the Iwi Collective Partnership responded in relation to Māori commercial and customary interests, as did a number of individual iwi groups. Quota owner and commercial representative groups that submitted included the Rock Lobster Industry Council

(RLIC), Rock Lobster Industry Associations (CRAMAC), Fisheries Inshore New Zealand Ltd (FINZ) and Deepwater Group Ltd (DWG). A number of recreational representative groups also submitted including LegaSea, NZ Sport Fishing Council (NZSFC) and NZ Recreational Fishing Council (NZRFC). A few eNGOs also made submissions, including the Environmental and Conservation Organisations of NZ (ECO) and Forest and Bird NZ.

Table 4: Summary of submissions received on fishstocks included in the April 2021 Sustainability Round.

Fishstock(s)	Total submissions	Submissions by main interest group of submitters[1]				
		Commercial fishing	Recreational fishing	Conservation/ Environmental	Tangata whenua and iwi representatives	Other [2]
Total	**165**	**38**	**11**	**5**	**9**	**102**
GSC 3, 5 & 6A	**8**	1	1	1	3	2
BCO 4	**9**	2	1	1	4	1
FLA 2	**10**	1	2	2	3	2
ELE 7	**9**	2	2	2	1	2
STA 1	**10**	1	1	2	3	3
GSH 1	**10**	2	1	1	3	3
YEM 9	**14**	1	3	2	3	5
Cockle Bay shellfish	**81**	0	1	2	1	77
CRA 1, 3, 4 & 5	**64**	32	11	3	7	11
PHC 1	**25**	7	5	3	5	5

[1] Main interest group was derived by how submitters identified themselves, but some submitters may fit within multiple categories (for example, there are commercial fishers and quota holders which are also tangata whenua and iwi representatives)
[2] Other groups included science-related, members of the public and unknown interests
[3] Totals include out of scope submissions which did not explicitly comment on proposed options for the stocks

5 Generic feedback received

5.1 Allowances within the TAC

46. After setting or varying the TAC for a stock, a separate decision arises in respect of allocating the TAC. This involves estimating and providing for Māori customary non-commercial fishing interest, recreational fishing interests, and other sources of mortality to the stock caused by fishing (including handling mortality and illegal take), then allocating the remaining catch to commercial fishers (the TACC).

47. Fisheries New Zealand notes that the law provides you discretion in considering relevant matters when setting these allowances within the TAC. However, tangata whenua and stakeholders often have differing views as to how this should be achieved.

48. Te Ohu Kaimoana notes that section 5 (b) of the Act obliges “all persons exercising or performing functions, duties, or powers conferred or imposed by or under it” to “act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (TOW(FC)SA)”. It considers that whenever you make a decision to implement a sustainability measure or to provide for utilisation, you must ensure your decision is consistent with, and does not undermine, the Fisheries Settlement.

Te Ohu Kaimoana consider that all increases to a TAC should be allocated to the commercial sector after providing for non-commercial Māori customary fishing and other sources of mortality caused by fishing. Further to this view Te Ohu Kaimoana believe that:

- In the absence of an agreement between mandated bodies, the recreational allowance should not be increased above the level it was first set by the Minister when the TAC was set for any particular stock.
- If to ensure sustainability, the TAC, TACC and the recreational allowance are reduced, the allowance should only be increased back to its initial level when the stock rebuilds.
- Otherwise, all increases to a TAC should be allocated to the TACC after providing for customary non-commercial fishing and other sources of mortality caused by fishing.

49. Quota allocated to Māori as part of pre- or post-settlement obligations had the same attributes as all other quota in relation to the ability of the Crown to reduce or increase the amount of ACE generated by shares in the fishery by adjustment to the TAC and TACC.

50. In a case relating to Kahawai the Supreme Court[2] said that the wording of the Act sets out a particular order of decisions – after allowing for Māori customary non-commercial fishing interest, recreational fishing interests, and all other sources of mortality caused by fishing, the remainder constitutes the TACC. On their ordinary meaning the words "allow for" require you both to take into account those interests, and to make provision for them in the calculation of the total allowable commercial catch. That does not, however, mandate any particular outcome.

51. Importantly, the Act does not confer priority for any interest over the other and does not limit the relative weight which you may give to the interests of competing sectors. It leaves that judgement to you.

52. The Courts have also provided guidance as to the nature of the allowances to be provided. Where there are competing demands that exceed an available resource it could perhaps be said you can 'allow for' use by dispensing a lesser allotment than complete satisfaction, creating not a full priority but some degree of shared pain.

53. The requirement to 'allow for' the recreational interest can be construed as meaning to "allow for in whole or part". The Supreme Court stated that the Act envisages that the allowance for recreational interest, as well as Māori customary fishing interests and the TACC, will be a reasonable one in all the circumstances.

54. Historically the recreational sector has argued that it is not reasonable to restrain that sector to levels of catch estimated at low levels of stock abundance. There is merit to the argument that case by case consideration based on current levels of stock abundance is required when allowing for recreational interests.

5.2 Setting other mortality allowances for inshore stocks

55. Other sources of mortality caused by fishing is an allowance that includes any mortality to a fish stock that occurs due to fishing activity that is not otherwise accounted for in the TAC. This includes incidental mortality associated with the requirement to return fish below the minimum legal size to the sea, mortality from accidental loss due to damaged or lost fishing gear and misreporting or illegal take. Fisheries New Zealand estimates this allowance where possible using best available information, whether that be stock specific or otherwise, and can include data derived from fisheries research and enforcement activities.

56. Other sources of mortality caused by fishing is naturally difficult to quantify when you consider the range of contributing sources. This means that for some stocks there is a high degree of uncertainty and/or nominal allowances are proposed. As part of the previous Minister's decisions on the *Review of Sustainability Measures for selected stocks for 1 October 2018* he suggested that the allowance for all other sources of mortality caused by fishing should generally equate to a minimum of 10% of the TACC for inshore stocks taken predominantly by trawl.[3]

[2] New Zealand Recreational Fishing Council Inc v Sanford Limited and Ors (Supreme Court, SC 40/2008, 29 May 2009)
[3] For further information see the previous Minister's Decision Letter for the 2018 October Sustainability Round.

57. This was concluded on the basis that a clear and consistent approach was needed for calculating the allowance for all other sources of mortality caused by fishing, and at the time, it was noted that a level of 10% best reflects the overall level of uncertainty in this information across all of the stocks taken predominantly by the trawl method. However, it was also noted that for stocks where there is information to suggest the allowance should be either higher or lower than 10%, this will be reflected in decisions for setting or changing this allowance.

58. Over recent sustainability rounds, a number of submitters including Te Ohu Kaimoana, Southern Inshore Fisheries and FINZ have expressed concerns relating to the above approach, suggesting that for some inshore trawl-caught fishstocks, there is a lack of rationale to support increasing the other mortality allowance to this level. Southern Inshore Fisheries have reiterated these concerns in this round, stating that where there is a current lack of information surrounding other mortality caused by fishing we should not be introducing uncertain or arbitrary figures for the allowance with no bearing on what actually happens.

59. Fisheries New Zealand considers it is appropriate to consider the previous Minister's directive but agrees with submitters that it is not appropriate to apply this approach arbitrarily (and is not doing so). Where there is information that can support a more accurate approach for certain stocks Fisheries New Zealand has considered this and provided that information in our advice to you.

5.3 Managing land-based impacts on marine fisheries

60. There are increasing expectations from iwi and fisheries stakeholders that government agencies will act in an integrated way to protect and remediate coastal fisheries habitat from land-based effects.

61. In this round there are sustainability measures proposed for flatfish (FLA 2), yellow-eyed mullet (YEM 9) and shellfish in Cockle Bay/Tuwakamana. Each of these fishstocks are typically found in harbours, estuaries or coastal waters where habitat degradation and pollution risks are of concern. Fisheries New Zealand has acknowledged these concerns in our advice on changes for these stocks, and accordingly, we have proposed options that take these concerns into account.

62. The majority of submissions we received on changes to the above stocks agreed with the importance of addressing land-based effects in these fisheries, although views on how to address these impacts varied. Te Ohu Kaimoana and FINZ have both expressed support for initiatives to look at applying tools to the source of this issue and also emphasised the need for collaboration and greater integration between governing agencies, industries, stakeholders and iwi/ Māori to support change.

63. Where such effects are localised, multi-sector/agency strategies and fisheries plans are proving effective at building support between agencies and stakeholders and identifying what needs to be done to address fisheries habitat decline.

64. Fisheries New Zealand has already taken further steps towards supporting this wider, cross-agency approach this year, by establishing a small unit within its Inshore Fisheries Team to work more closely with councils, territorial authorities and the Department of Conservation to input into regional planning processes and advocate for actions that protect fisheries habitat and biodiversity.

5.4 Observers and camera coverage on inshore vessels

65. Several submitters have raised concerns in this and previous sustainability rounds around levels of observer and camera coverage on inshore commercial vessels. In particular, Forest and Bird have highlighted discrepancies in bycatch figures between observed and non-observed trips and called for improved verification to ensure accurate reporting. Several individual submitters also reiterated the importance of having wider camera coverage across the inshore commercial fishing fleet.

66. To increase levels of independent verification across those inshore fisheries which pose a risk to protected species, Cabinet has agreed to provide financial support for the wider roll out of cameras, subject to a business case and public consultation. Fisheries New Zealand have prepared a Business Case to inform the Budget 2021 initiative and provided you with a Cabinet paper for the preferred option within the Business Case.

5.5 Preferential allocation (Section 28N) rights

67. Preferential allocation rights were granted to permit holders under section 28N of the Fisheries Act 1983 who elected to take administrative rather than compensated reductions to their catch allocations. When the TACC is increased for a stock that has 28N rights associated with it, the quota shares of owners who do not have 28N rights are reduced and redistributed to the holders of 28N rights[4].

68. Te Ohu Kaimoana and other Iwi representatives (Te Arawa Fisheries and the Iwi Collective Partnership) oppose the application of 28N rights, deeming them to be inconsistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 because they have the effect of reducing the proportion of settlement quota shares. As a consequence, these entities do not support TACC increases where there are 28N rights held until there is a wider resolution to this matter.

69. In situations where decisions have been made to increase a TACC to which 28N rights apply, Te Ohu Kaimoana, as a matter of principle, has stated that it is required to legally challenge the decision. Legal challenges have the effect of delaying the implementation of any TACC increase, thereby preventing increased utilisation of a stock.

70. In this sustainability round, there is a single stock (BCO 4 – blue cod) with 600 kg of associated 28N rights. However, in our review for this stock, we are proposing for the TAC and allowances to be set without varying the current TACC. This means that unless you make the decision to introduce another option for this stock which involves a change to the TACC, these rights will not be affected (and therefore are not expected to be subject to legal challenge on this matter).

[4] This is done in accordance with formulas set out in Section 23 of the Act.

Giant spider crab (GSC 3, 5, and 6A) – South East Coast, Chatham Rise & Southland and southern offshore islands)

Jacquinota edwardsii

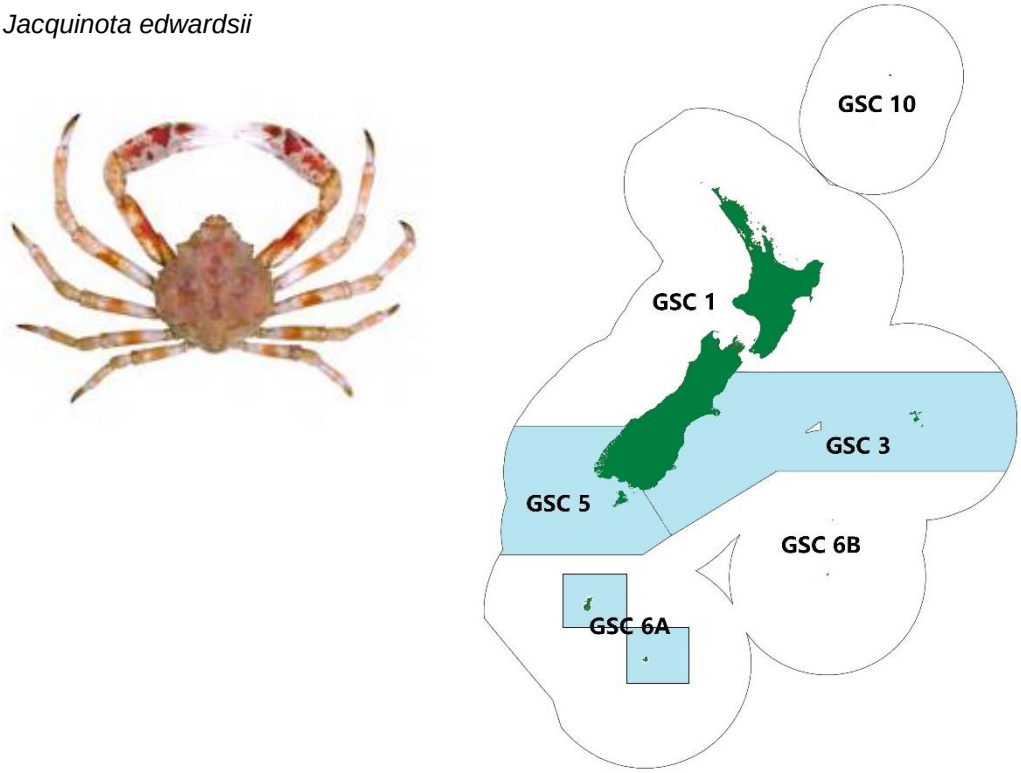

Figure 1: Quota Management Areas (QMAs) for giant spider crab (GSC), with GSC 3, 5 & 6A highlighted in blue. A giant spider crab is pictured on the left.

Table 1: Summary of options proposed for GSC 3, 5 and 6A from 1 April 2021. Figures are all in tonnes. The preferred options of Fisheries New Zealand are highlighted in blue.

Stock	Option	TAC	TACC	Allowances		
				Customary Māori	Recreational	All other mortality caused by fishing
GSC 3	**Option 1** *(Status quo)*	15	14	0	0	1
	Option 2	21 ↑ (6 t)	19 ↑ (5 t)	0	0	2 ↑ (1 t)
GSC 5	**Option 1** *(Status quo)*	20	19	0	0	1
	Option 2	96 ↑ (76 t)	86 ↑ (67 t)	0	0	10 ↑ (9 t)
GSC 6A	**Option 1** *(Status quo)*	165	148	0	0	17
	Option 2	187 ↑ (22 t)	170 ↑ (22 t)	0	0	17
New option(s) incorporated following consultation				No		
Total submissions received for GSC stocks				**8**		
Number of submissions received in support of each option				**GSC 3**	**GSC 5**	**GSC 6A**
Option 1				**3**	**3**	**3**
Option 2				**3**	**3**	**5**
Other				**0**	**0**	**0**

1 Why are we proposing a review?

71. Fisheries New Zealand is proposing that you review sustainability measures for giant spider crab in GSC 3, 5 and 6A for the 1 April 2021 fishing year.

72. Giant spider crab are not targeted but are a bycatch of the squid fishery. Since introduction to the Quota Management System (QMS) in 2004, catch rates of giant spider crab in the squid trawl fishery have increased.

73. As higher catch rates indicate an increase in abundance, Fisheries New Zealand proposes that you increase the Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) for GSC 6A, and the TAC, allowance for other sources of mortality caused by fishing and TACC for GSC 3 and 5.

74. Single options for change are proposed for each stock (Table 1). The proposed options in this paper would increase the TAC of each stock with some allowance to account for the continuing trend of increasing catch rates.

1.1 About the stock

1.1.1 Fishery characteristics

75. Giant spider crab in GSC 3, 5 and 6A are entirely taken as non-target catch (bycatch), mostly by large trawl vessels (above 28 metres in total length) targeting squid. Since introduction to the QMS in 2004, catch rates of giant spider crab in the squid trawl fishery have increased.

76. Giant spider crab form an unwanted portion of catch in the squid trawl fishery due to vessels being ill-equipped to handle, process and store the crabs. Large catches can disrupt processing of target species and reduce overall economic value of the catch. As such, fishers are incentivised to avoid catching the crabs, and the majority of catch is returned to the sea with the authorisation of an on-board Fisheries New Zealand observer.

1.1.2 Biology

77. From the intertidal area to depths over 500 metres, giant spider crab is found around the south and southeast coast of the South Island and in sub-Antarctic waters. Giant spider crab is thought to be most abundant southeast of the Snares Islands, on the Pukaki Rise and around the Auckland Islands.

78. There is very little information available on age, growth and natural mortality of giant spider crab. However, they are known to exhibit “mounding” behaviour in which large numbers of crabs form clumps when the crabs moult their shells. This behaviour is particularly evident during spring and autumn and can result in large catches of giant spider crab by trawl vessels.

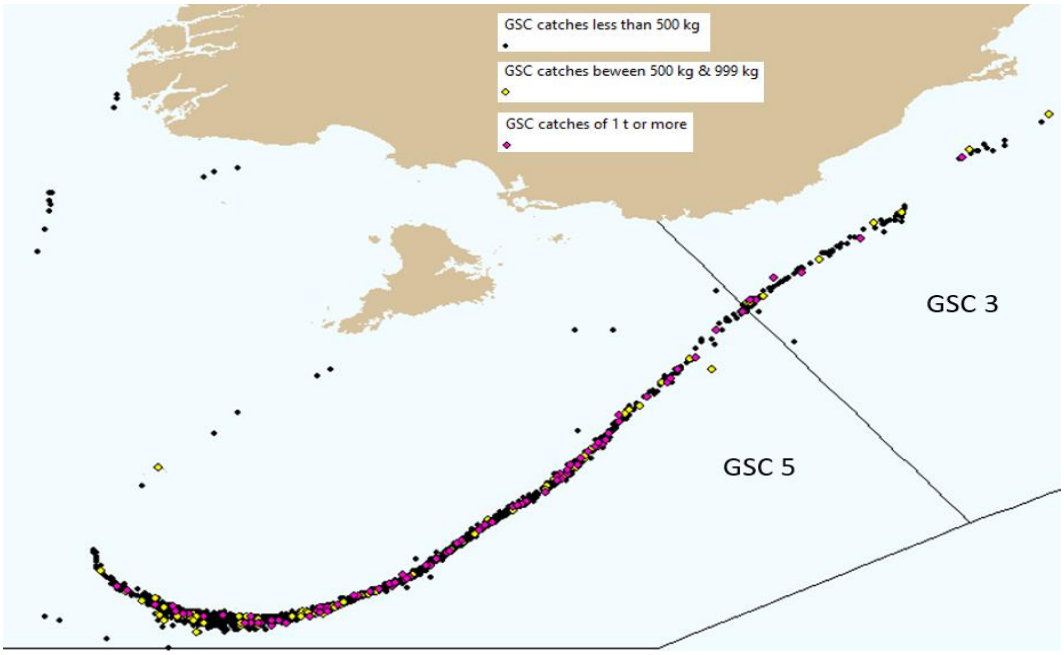

Figure 2: Start of fishing event position for all reported giant spider crab catches on the Stewart Snares shelf since introduction to the QMS in April 2004.

79. The location of giant spider crab catches mirrors that of squid trawl effort, with the majority of the catch taken along the Stewart Snares shelf or around the Auckland Islands. Almost all (96%) catches from GSC 3 are taken from tows conducted south of the Otago Peninsula (statistical areas 026 & 027), which is just north of the border between GSC 3 and GSC 5 (Figure 2). Given the spatial distribution of catches, it is likely that giant spider crab caught off the Otago Coast and those caught further south along the Stewart Snares shelf (GSC 5) comprise the same biological stock.

1.2 Status of the stocks

80. In the absence of a species-specific harvest strategy, the default management target of 40% B_0 and associated reference points (as set out in the Harvest Strategy Standard) are applied to giant spider crab stocks. However, giant spider crab stocks are a low knowledge stock, and the status of giant spider crab in relation to the default management targets and associated reference points is not known.

81. The squid fishery is highly observed with annual coverage rates averaging 88% between 2012/13 and 2019/20. Modelled estimates of total GSC catch based on observer-reported data from the squid fishery show a significant increase in the amount of giant spider crab taken as bycatch since introduction to the QMS while squid fishing effort has generally declined across the same period (Figure 3).

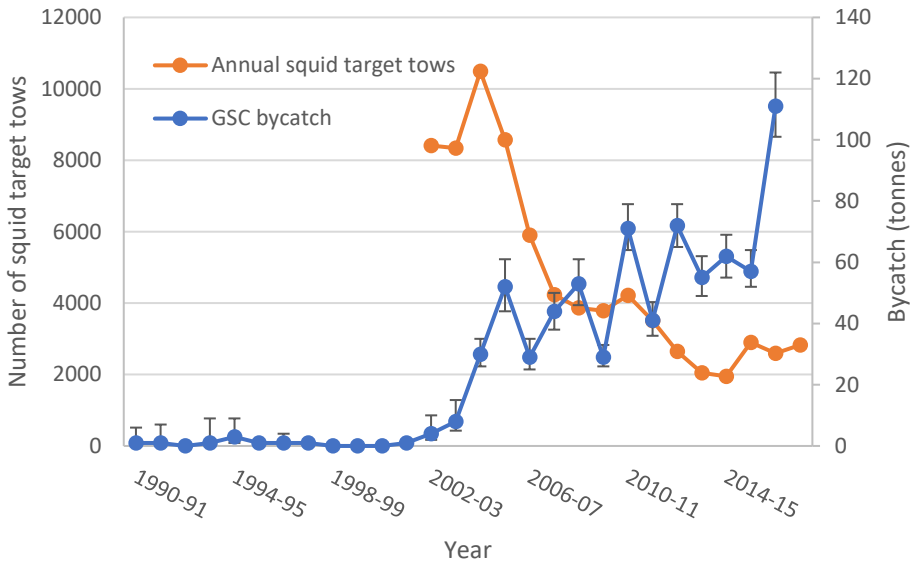

Figure 3: Modelled estimates of giant spider crab catches (all QMAs combined) from the squid trawl fishery between 1990/91 and 2016/17. Includes estimates of 95% CI (taken from Finucci *et al*, 2019). Plotted against annual squid target tows between 2002/03 and 2017/18.

82. Unstandardised Catch-Per-Unit-Effort (CPUE) indices using observer-derived catch information show less of a trend than that seen in GSC 5 and GSC 6A, likely due to lower levels of squid trawl effort in the lower latitudes of this stock and historically lower levels of observer coverage in GSC 3.[5] However, data between 2013/14 and 2019/20 are suggestive of an increase in the catch rates of GSC 3 (Figure 4), and this stock is likely part of the same biological stock as GSC 5, where the CPUE increase is more significant.

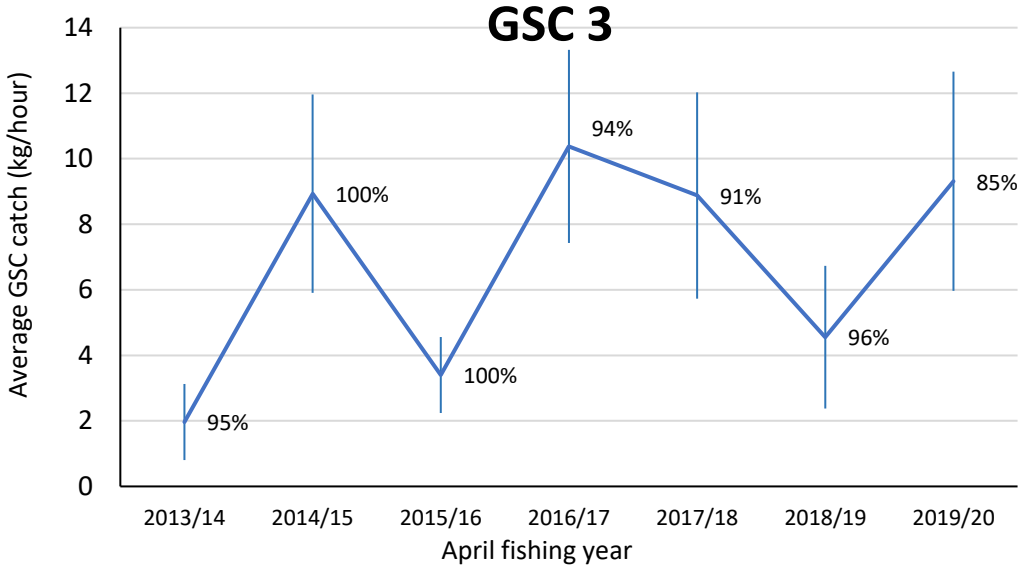

Figure 4: Observer reported giant spider crab catch (kg) per hour of towing for squid in target tows that started within GSC 3. Data labels refer to percent observer coverage whilst error bars represent standard error. Data from before the 2013/14 fishing year have not been included due to the low observer coverage (<25%) and uncertainty in information.

5 Observer coverage of squid target tows starting within those parts of statistical areas 026 & 027 that are within the GSC 3 QMA, averaged 12% per annum between the 2004/05 and 2012/13 (April) fishing years.

83. Unstandardised Catch-Per-Unit-Effort (CPUE) indices using observer-derived catch information strongly suggest an increase in giant spider crab catch rates in GSC 5 and 6A since introduction to the QMS (Figures 5 and 6). There is no evidence of significant spatial or temporal changes in the squid fishery during this time that might have an influence on CPUE. Nearly all squid fishing effort has been conducted by a discrete fleet of large vessels along the Stewart Snares shelf or around the Auckland Islands between the months of December and June.

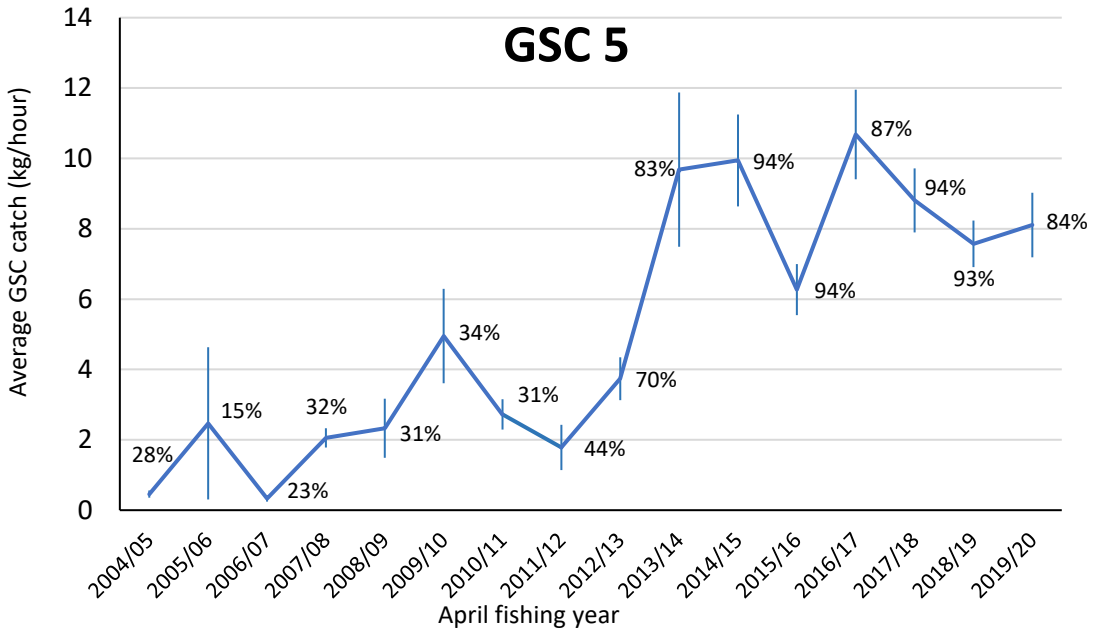

Figure 5: Observer reported giant spider crab catch (kg) per hour of towing for squid in target tows that started within GSC 5. Data labels refer to percent observer coverage whilst error bars represent standard error.

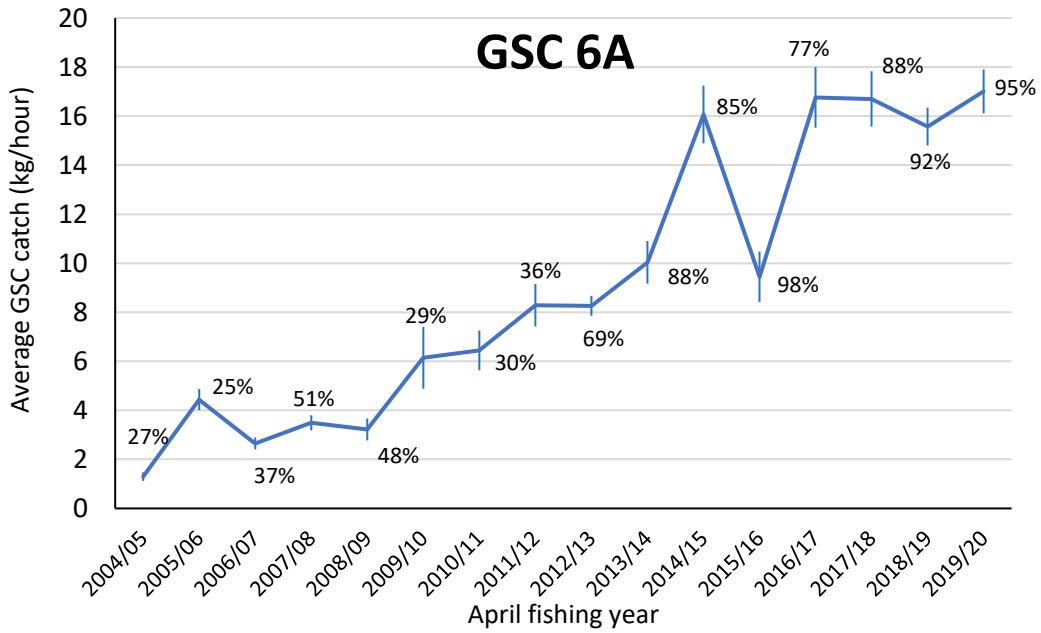

Figure 6: Observer reported giant spider crab catch (kg) per hour of towing for squid in target tows that started within GSC 6A. Data labels refer to percent observer coverage whilst error bars represent standard error.

2 Catch information and current settings within the TAC

2.1 Commercial

84. Although profitable deepwater crab fisheries exist in other countries, targeted giant spider crab fisheries have not become established in New Zealand despite multiple attempts to do so since the 1960s. In recent years, all giant spider crab in GSC 3, 5 and 6A have been taken as non-target catch (bycatch of up to 10 tonnes per fishing event), principally by large trawl vessels targeting squid.

85. Giant spider crab is potentially a high-value species, but trawl vessels are not equipped to appropriately store, handle or process the crabs. In addition, trawl-caught giant spider crabs are often damaged. There are incentives for fishers to avoid catching giant spider crab since large catches can disrupt factory processing of squid and there is no economic value for trawl-caught crabs. Nearly all giant spider crab caught is currently returned to the sea with the authorisation of an on-board observer. Such returns are required to be recorded and balanced with Annual Catch Entitlement (ACE).

86. Catches of giant spider crab in GSC 3, 5 and 6A have increased since introduction to the QMS, particularly in GSC 5 where catches have regularly exceeded the available ACE in recent years (Figure 7). Trawl effort targeting squid, whilst variable between years, has decreased from 10,489 tows in 2004/05 to 2,830 tows in 2017/18.

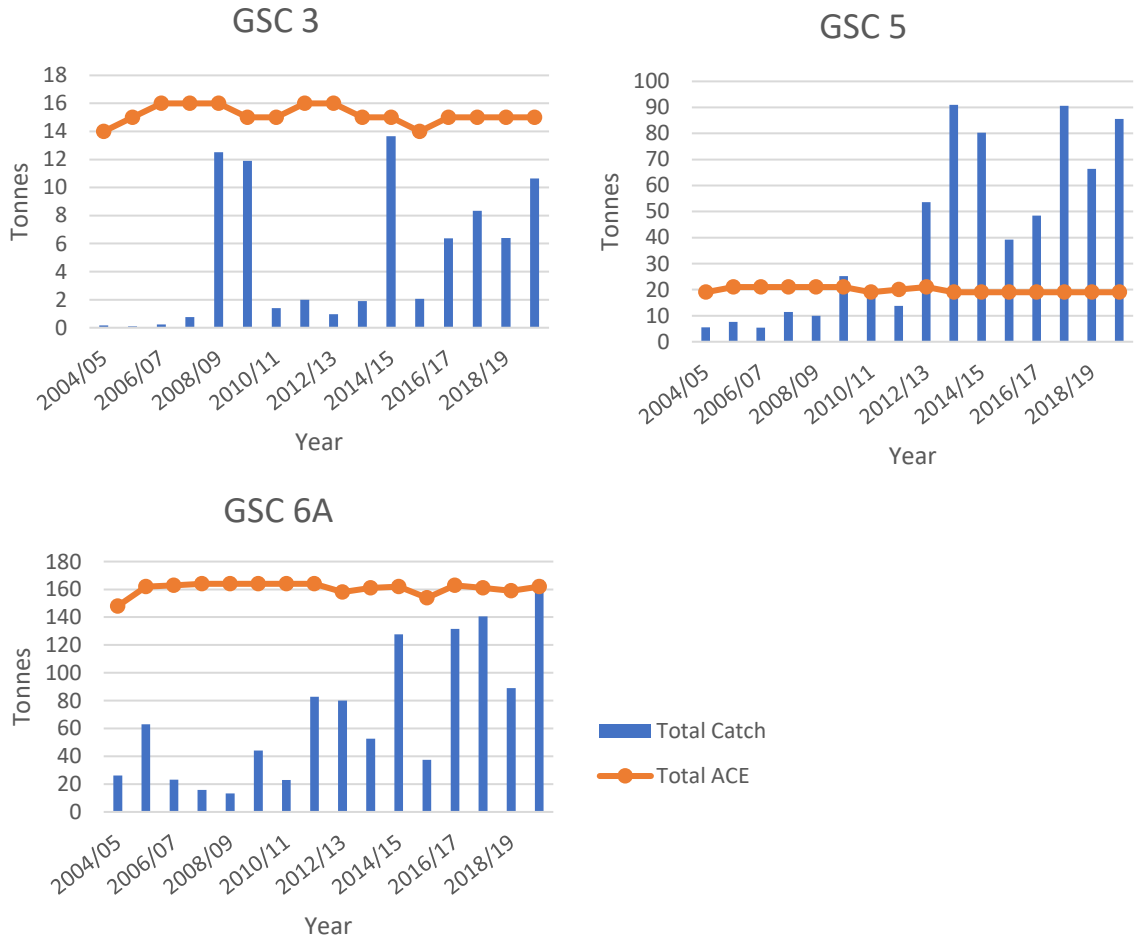

Figure 7: GSC 3, 5 and 6A catch compared with available from 2004/05 to 2019/20 fishing years.

2.2 Non-commercial fisheries

87. There are no known records of recreational or customary catches of giant spider crab in New Zealand waters.

2.3 All other mortality caused by fishing

88. The allowance for all other mortality caused by fishing accounts for unreported giant spider crab mortality caused by fishing gear (giant spider crab returned to the sea after being caught is counted against the quota owner's ACE, not the allowance for other mortalities caused by fishing gear). The allowance for other mortality caused by fishing is currently set at one tonne for each of GSC 3 and 5, and at 17 tonnes for GSC 6A.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

89. Input and participation by Māori 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 interests in fisheries. Particular regard should be given to the perspectives of kaitiakitanga when making sustainability decisions.

90. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.

91. In November 2020, the proposal to review the TACs of GSC 3, 5 and 6A was brought to Iwi Fisheries Forums to seek their input.

92. While no specific feedback was received relating to GSC 3, 5 or 6A prior to or during consultation, the Mid-North forum has stated they do not support increases to any TACCs in their rohe moana. None of the giant spider crab stocks proposed for review overlap with the rohe moana of the Mid-North forum.

3.2 Kaitiakitanga

93. The GSC 3, 5 and 6A stocks overlap with the rohe moana of Te Waka a Māui Iwi Fisheries Forum and the Chatham Islands Fisheries Forum.

94. Although giant spider crab is not named specifically as a taonga species, all marine species are considered taonga in Te Waipounamu Iwi Forum Fisheries Plan. Fisheries New Zealand considers the proposals for GSC 3, 5 and 6A align with the management objectives of Te Waipounamu Iwi Forum Fisheries Plan. The management objectives which are particularly relevant to the management options proposed for GSC 3, 5 and 6A are:

    - **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

95. Whilst the Chatham Island Fisheries Forum is currently in recess, Fisheries New Zealand considers the proposed options for GSC 3, 5 and 6A are consistent with the management objectives of the Chatham Islands Forum Fisheries Plan (CIFF@44°).

96. There are no customary fisheries management tools such as mātaitai, taiāpure or Section 186B temporary closures relevant to this review.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

97. Fisheries New Zealand considers it highly unlikely that the options proposed in this paper will result in the initiation of a target fishery for giant spider crab. Likewise, the amount of trawl effort targeting squid or other deepwater species is not expected to increase as a consequence of the proposed increases to the TAC and TACC.

98. There are several species of marine mammals and seabirds which inhabit GSC 3, 5 and 6A. Some of these species, including the New Zealand sea lion, fur seal and albatrosses are occasionally caught as bycatch in the squid trawl fishery, particularly in GSC 6A where interactions are more frequent. It is possible that the increase in TACC will allow squid fishing to become more affordable (quota owners will likely pay less in GSC deemed values) and therefore, squid fishing effort could increase. This would result in the potential for more interactions with marine mammals, seabirds and other protected species as well as benthic habitats. This is highly unlikely however due to the comparably small deemed value prices (just over $14,000 in 2019/20 fishing year) paid by fishers relative to the squid export value ($195 million in 2020). Fisheries New Zealand will continue to carefully monitor the bycatch of protected species so that appropriate decisions can be made in the event that an issue arises.

99. The potential impacts of the proposed TACC increases on associated or dependent species, including marine mammals and seabirds, the biological diversity of the aquatic environment, and habitats of particular significance for fisheries management are considered negligible.

4.2 Sustainability measures (section 11 of the Act)

100. Section 11 of the Act sets out various matters that you must take into account or have regard to when setting or varying any sustainability measures (such as a TAC). These include any effects of fishing on the stock and the aquatic environment, the natural variability of the stock concerned, and any relevant fisheries plans.

National Fisheries Plan Deepwater and Middle-depth Fisheries

101. Giant spider crab GSC 3, 5 and 6A are managed as a Tier 2 species within the National Fisheries Plan for Deepwater and Middle-depth fisheries 2019 – Part 1A (National Deepwater Plan). The National Deepwater Plan sets out a series of Management Objectives for deepwater fisheries, the most relevant to GSC 3, 5 and 6A 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 11**: Ensure New Zealand's deepwater and middle-depth fisheries are transparently managed.

    The National Deepwater Plan is a formally approved s11A fisheries plan which you must take into account when making sustainability decisions.

102. There are no other plans, strategies or statements relevant to giant spider crab in GSC 3, 5 and 6A.

Setting the TAC

103. The level of the stock that can produce the maximum sustainable yield is not able to be estimated reliably using the best available information. Therefore, for the purpose of GSC 3, 5 and 6A you must set a TAC under section 13(2A) of the Fisheries Act.

104. As the status of giant spider crab stocks in GSC 3, 5 and 6A is not well known, it is possible that current catch levels could result in a decline in biomass. However, the risk of this is considered low given that catch rates have increased significantly over a number of years. As such, Fisheries New Zealand considers the proposed increases to be not inconsistent with the

objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

5 Submissions

105. There were eight submissions on the proposed changes to GSC 3, 5 and 6A (Table 2). The responses were mixed between Options 1 and 2 for all three stocks. Three submitters were in support of the status quo and three in support of Option 2. There were another two submissions which indicated support of Option 2 for GSC 6A alone and did not comment on GSC 3 or 5.

Table 2: Written submissions and responses received for GSC 3, GSC 5 and GSC 6A (in alphabetical order)

Submitter	Option Support								
	GSC 3			GSC 5			GSC 6A		
	1	2	other	1	2	other	1	2	other
Deepwater Group Limited (DWG)		✓			✓			✓	
D. Mladek	✓			✓			✓		
Environmental and Conservation Organisations NZ (ECO)	✓			✓			✓		
Iwi Collective Partnership (ICP)								✓	
M. Currie	✓			✓			✓		
NZ Recreational Fishing Council		✓			✓			✓	
Te Arawa Fisheries								✓	
Te Ohu Kaimoana		✓			✓			✓	

6 Options and analysis

Table 3: Summary of options proposed for GSC 3, 5 and 6A from 1 April 2021. Figures are all in tonnes. The preferred options of Fisheries New Zealand are highlighted in blue.

Stock	Option	TAC	TACC	Allowances		
				Customary Māori	Recreational	All other mortality caused by fishing
GSC 3	**Option 1** *(Status quo)*	15	14	0	0	1
	Option 2	21 ↑ (6 t)	19 ↑ (5 t)	0	0	2 ↑ (1 t)
GSC 5	**Option 1** *(Status quo)*	20	19	0	0	1
	Option 2	96 ↑ (76 t)	86 ↑ (67 t)	0	0	10 ↑ (9 t)
GSC 6A	**Option 1** *(Status quo)*	165	148	0	0	17
	Option 2	187 ↑ (22 t)	170 ↑ (22 t)	0	0	17

6.1 Option 1 *(Status quo)*

106. Option 1 for all three stocks is to remain at the status quo. Three submissions (ECO, D. Mladek, and M. Currie) supported this option. ECO's rationale includes the need to take a precautionary approach to fisheries management and the negative impact of bottom trawling on the benthic habitat. D. Mladek expressed concerns for the large quantity of bycatch caught by the commercial fishing industry and would like to see a decrease in TACs and TACCs across

all stocks. M. Currie had similar concerns and commented in the interest of wildlife conservation and biodiversity.

107. The best information available indicates an increase in abundance of giant spider crab and Fisheries New Zealand notes that remaining with the status quo may result in a lost utilisation opportunity. As such, the status quo is not considered an optimal option by Fisheries New Zealand.

6.2 Option 2 - Preferred

108. As the stock status of giant spider crab in GSC 3, 5 & 6A is not known, it is possible that current catch levels could result in a biomass decline over the long term. However, the risk of this is considered low given that catch rates have continued to increase alongside total catch. As such, Fisheries New Zealand considers it unlikely that the proposed options will result in a sustainability risk to the stocks.

109. Based on the best available information showing a likely increase in giant spider crab abundance, Fisheries New Zealand considers that for all three stocks, Option 2 is not inconsistent with the objective of maintaining the stocks at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

110. For all three stocks, the proposed changes would result in increasing the availability of ACE with which commercial fishers could balance against increased giant spider crab bycatch, should the trend of increasing catch rates continue.

111. As all giant spider crab in GSC 3, 5 and 6A are taken as bycatch, Fisheries New Zealand does not expect catches of giant spider crab to increase above existing levels as a consequence of the proposed option.

GSC 3

112. Option 2 would increase the TAC of GSC 3 by six tonnes so that it is set at 21 tonnes. Within the TAC, the TACC of GSC 3 would be increased by five tonnes so that it is set at 19 tonnes. This is above current or historical catches of GSC 3.

113. As there is no information suggesting any customary or recreational harvest of giant spider crab in GSC 3, no changes are proposed to the customary Māori or recreational allowance of GSC 3.

114. An increase of one tonne is proposed to the allowance for all other mortality to the stock caused by fishing. This allowance accounts for unreported giant spider crab mortality (such as due to trawl damage) and would set the allowance for all other mortality to the stock caused by fishing at an amount that equals approximately 10% of the TACC.

115. Three of the eight submitters supported Option 2 for GSC 3. Deepwater Group Ltd and Te Ohu Kaimoana supported the proposals based on the rationale presented by Fisheries New Zealand. The New Zealand Recreational Fishing Council supported Option 2 for all three stocks with a proviso that a two tonne allowance be made for the recreational catch in each stock.

116. Fisheries New Zealand considers the increase in CPUE to represent the best available information, and that there is an opportunity to sustainably increase the TAC of this stock.

GSC 5

117. Option 2 would increase the TAC of GSC 5 by 76 tonnes so that it is set at 96 tonnes. Within the TAC, the TACC of GSC 5 would be increased by 67 tonnes so that it is set at 86 tonnes

118. The proposed increase uses the same approach as that taken upon introduction to the QMS (catch averaged over three years) with an additional five tonnes added to account for a continuation of the increasing trend in catch rates.

119. There is no information suggesting any customary or recreational harvest of giant spider crab in GSC 5, and therefore no changes are proposed to the customary Māori or recreational allowance of GSC 5.

120. An increase of nine tonnes is proposed to the allowance for all other mortality to the stock caused by fishing. This would set the allowance for all other mortality to the stock caused by fishing at an amount that equals approximately 10% of the TACC.

121. Three of the eight submitters supported Option 2 for GSC 5. Deepwater Group Ltd and Te Ohu Kaimoana supported the proposals based on the rationale presented by Fisheries New Zealand. The New Zealand Recreational Fishing Council supported Option 2 for all three stocks with a proviso that a two tonne allowance be made for the recreational catch in each stock.

122. Fisheries New Zealand considers the increase in CPUE to represent the best available information, and that there is an opportunity to sustainably increase the TAC of this stock.

GSC 6A

123. Option 2 would increase the TAC of GSC 6A by 22 tonnes so that it is set at 187 tonnes. Within the TAC, the TACC of GSC 6A would be increased by 22 tonnes so that it is set at 170 tonnes. This is above current or historical catches of GSC 6A.

124. There is no information suggesting any customary or recreational harvest of giant spider crab in GSC 6A, therefore no changes are proposed to the customary Māori or recreational allowance of GSC 6A.

125. As the current 17 tonne allowance for all other mortality to GSC 6A caused by fishing equates to 10% of the proposed TACC, no changes to this allowance are proposed at this time.

126. Five of the eight submitters supported Option 2 for GSC 6A. Deepwater Group Ltd and Te Ohu Kaimoana supported the proposals based on the rationale presented by Fisheries New Zealand. The New Zealand Recreational Fishing Council supported Option 2 for all three stocks with a proviso that a two tonne allowance be made for the recreational catch in each stock.

127. Te Arawa Fisheries and the Iwi Collective Partnership both made submissions on GSC 6A only. Both support Option 2 with the rationale that their annual sales of giant spider crab makes minimal return at the current TACC.

6.3 Other options proposed by submitters

128. As stated above, NZ Recreational Fishing Council proposed to introduce a two tonne allowance for recreational catch in GSC 3, 5 and 6A.

129. Fisheries New Zealand has no data to suggest that there is currently a recreational harvest of giant spider crab in GSC 3, 5 or 6A and therefore considers there is no need to set an allowance for recreational fishing at this time, noting that he lack of an allowance for recreational fishing does not preclude the recreational take of giant spider crab.

130. The NZ Recreational Fishing Council also expressed concerns that there is no mention of landings under section 111 (fish claimed as recreational catch that's taken during a commercial fishing trip), or any allowance for crew consumption. However, since the introduction of giant spider crab to the QMS there have been negligible reports of landings under section 111 and catch consumed by crew is balanced with ACE and accounted for within the TACC.

6.4 Deemed values

131. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

132. The deemed value rates of GSC 3, 5 and 6A are shown in Table 4. The deemed value rates for the three stocks are unchanged since 2015.

Table 4: Current deemed value rates ($/kg) for GSC 3, 5 and 6A.

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
GSC 3	0.09	0.10	0.12	0.14	0.16	0.18	0.20
GSC 5	0.09	0.10	0.12	0.14	0.16	0.18	0.20
GSC 6A	0.09	0.10	0.12	0.14	0.16	0.18	0.20

133. The average price paid by fishers during the 2020/21 (April) fishing year for one kilogram of GSC 5 & 6A ACE is $0.10 and $0.09 respectively. The average price paid by fishers during the 2019/20 (April) fishing year for one kilogram of GSC 3 ACE was $0.09 (this is the most recent year with available data on ACE price for this stock).

134. The 2020/21 port price index of all three stocks is $0.20/kg, and this has remained unchanged since 2014/15.

135. Current deemed value rates of GSC 3, 5 and 6A are set at, or slightly above the average ACE price, which is consistent with the objectives to incentivise fishers to balance against ACE rather the purchase deemed values. As such, no changes are proposed to the deemed value rates of GSC 3, 5 and 6A at this time.

136. In its submission Te Ohu Kaimoana noted that it supported retaining these deemed value settings.

7 Conclusions and recommendations

137. Catch rates of giant spider crab in GSC 3, 5, and 6A have increased since the introduction to the QMS in 2004. The CPUE indices derived from observer-collected information are strongly suggestive of increasing giant spider crab abundance in these areas, particularly in GSC 5 where catches often exceed the available ACE.

138. Using the best available data, Fisheries New Zealand recommends Option 2 for GSC 3, 5 and 6A, as these options align most strongly with the management objectives. Fisheries New Zealand considers it unlikely that the recommended options will impact upon the sustainability of GSC 3, 5 and 6A or result in any adverse effects on the aquatic environment.

8 Decision for GSC 3

Option 1 *(Status quo)*

Agree to retain the **GSC 3** TAC at 15 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Retain the allowance for all other sources of mortality to the stock caused by fishing at 1 tonne;
iv. Retain the GSC 3 TACC at 14 tonnes.

~~**Agreed / Agreed as Amended**~~ **/ Not Agreed**

OR

Option 2 *(Fisheries New Zealand preferred option)*

Agree to set the **GSC 3** TAC at 21 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Increase the allowance for all other sources of mortality to the stock caused by fishing from 1 to 2 tonnes;
iv. Increase the **GSC 3** TACC from 14 to 19 tonnes.

Agreed / ~~**Agreed as Amended / Not Agreed**~~

9 Decision for GSC 5

Option 1 *(Status quo)*

Agree to retain the **GSC 5** TAC at 20 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Retain the allowance for all other sources of mortality to the stock caused by fishing at 1 tonne;
iv. Retain the **GSC 5** TACC at 19 tonnes.

~~Agreed / Agreed as Amended~~ / Not Agreed

OR

Option 2 *(Fisheries New Zealand preferred option)*

Agree to set the **GSC 5** TAC at 96 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Increase the allowance for all other sources of mortality to the stock caused by fishing from 1 to 10 tonnes;
iv. Increase the **GSC 5** TACC from 19 to 86 tonnes.

Agreed / ~~Agreed as Amended~~ / Not Agreed

10 Decision for GSC 6A

Option 1 *(Status quo)*

Agree to retain the **GSC 6A** TAC at 165 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Retain the allowance for all other sources of mortality to the stock caused by fishing at 17 tonnes;
iv. Retain the **GSC 6A** TACC at 148 tonnes.

Not agreed DP

~~**Agreed / Agreed as Amended / Not Agreed**~~

OR

Option 2 *(Fisheries New Zealand preferred option)*

Agree to set the **GSC 6A** TAC at 187 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 0 tonnes;
ii. Retain the allowance for recreational fishing interests at 0 tonnes;
iii. Retain the allowance for all other sources of mortality to the stock caused by fishing at 17 tonnes;
iv. Increase the **GSC 6A** TACC from 148 to 170 tonnes.

Agreed ~~**/ Agreed as Amended / Not Agreed**~~

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Blue Cod (BCO 4) – Chatham Islands

Parapercis Colias, Rāwaru, Hakoma

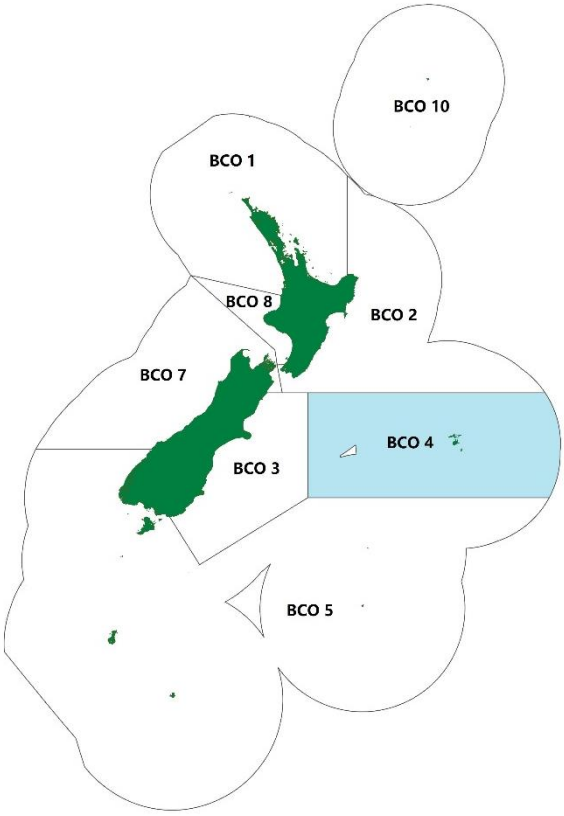

Figure 1: Quota Management Areas (QMAs) for blue cod (BCO), with BCO 4 highlighted in blue. A blue cod is pictured on the left.

Table 1: Summary of options proposed for BCO 4 from 1 October 2021. Figures are all in tonnes. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current setting *(Status quo)*	-	759.339	-	-	-
Option 1	829.339	759.339	10	20	40
New option incorporated following consultation		No			
Total submissions received		10			
Number of submissions received in support of each option		Option 1	4		
		Other	6		

1 Why are we proposing a review?

139. Upon introduction to the QMS, BCO 4 had a TACC set but no TAC and allowances. In line with the National Blue Cod Strategy, Fisheries New Zealand considers it a priority to set a TAC and allowances for this stock for the 1 October 2021 fishing year.

1.1 About the stock

1.1.1 Fishery characteristics

140. BCO 4 is an inshore fishery, almost exclusively taken by target potting. Most Chatham Islands blue cod fishers are primarily rock lobster fishers, with blue cod fishing mostly occurring in autumn/winter when the rock lobster season is closed. Blue cod are an important shared fishery.

141. Management objectives for this fishery are set out in the National Blue Cod Strategy.[6] The strategy prioritises setting a TAC and allowances for BCO 4.

1.1.2 Biology

142. Blue cod are an important inshore species out to a depth of 300 m. They live for up to thirty years and are moderately productive. Generally, blue cod have a constrained home range and, therefore, are susceptible to localised depletion

1.2 National Blue Cod Strategy

143. 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 4.

144. Recent measures already implemented in BCO 4 as part of the strategy include a reduced recreational daily limit from 30 to 15, an increased minimum legal size of 33 cm and a standardised cod pot mesh size of a minimum 54 mm.

1.3 Status of the stock

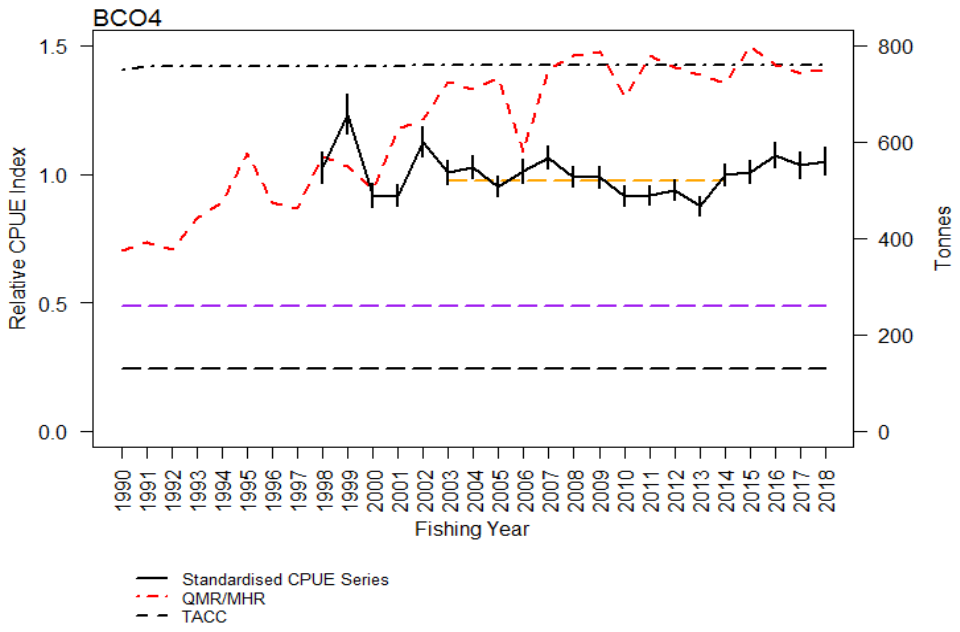

Figure 2: BCO 4 standardised Catch Per Unit Effort (CPUE) series for 1998–2018. Also plotted are the landings and the BCO 4 TACC. The orange line represents the B_{MSY} proxy of mean CPUE from 2003–2014. The purple line is the Soft Limit [1/2 the B_{MSY} proxy] and the grey line is the Hard Limit [1/4 the B_{MSY} proxy].

[6] https://www.fisheries.govt.nz/protection-and-response/sustainable-fisheries/national-blue-cod-strategy/

145. The best available information on the status of BCO 4 is the May 2020 Plenary Document, updated Catch-Per-Unit-Effort (CPUE) assessments and catch landing returns.

146. The stock status is currently assessed relative to a default target biomass level (a B_{MSY} proxy based on mean CPUE for the period 2002/03 to 2013/14 when both catch and CPUE were stable). The soft limit is set as 50% of the B_{MSY} proxy and hard limit of 25% of the B_{MSY} proxy.

147. The 2019 Plenary concluded that the 2019 biomass was likely (>60%) to be at or above the target, with overfishing about as likely as not (40-60%) to be occurring.

2 Catch information and current settings within the TAC

2.1 Commercial

148. Figure 3 below shows that the annual commercial catch in BCO 4 has been stable over the last ten years.

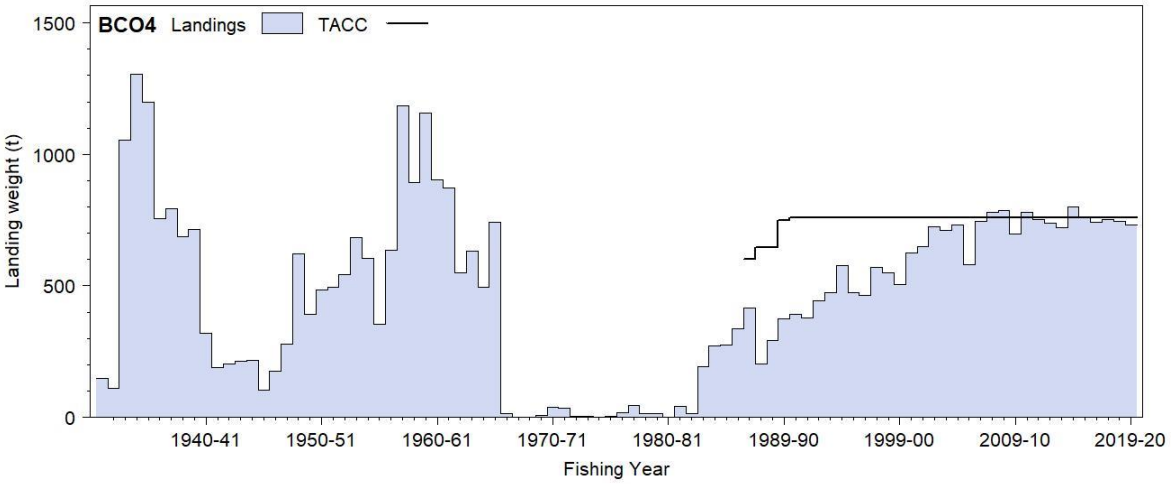

Figure 3: Annual Commercial BCO 4 Landings (in tonnes) from 1930/1931 to 2019/2020.

149. There are 13 discrete inshore areas around the coastline where commercial fishing is prohibited (both recreational and customary fishing are allowed). These areas are primarily in place as part of management of the pāua fishery. Four of these areas are around Pitt Island while the remainder are around the Chatham Island coast.

150. There is high certainty in terms of commercial catch information, however, uncertainties in the information include:

- **Change of pot mesh dimensions:** From 1 July 2020 the minimum inner mesh size for blue cod pots in BCO 4 was increased from 48 mm to 54 mm (some of the fleet had begun transitioning their pots in 2017/18). The larger sized mesh was shown to reduce the capture portion of undersize blue cod (< 33 mm) 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 years.[7] The implications of the changes associated with the increase in mesh diameter have not been considered.

- **Changes in fishing behaviour***:* Long term fishers report there have been changes in fisher behaviour; for example, changes in the number of pots being fished, and changes in areas fished (local versus long-distance). It is not known to what degree this behaviour

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

has been adopted but these behaviours, usually associated with maintaining catch rates, may have biased high recent CPUE estimates.

- **Size:** Some fishers report that the size of the individual fish they are catching is getting smaller and that the bigger fish are not so prevalent in the catch. This might suggest that there is growth overfishing[8] occurring in some parts of the fishery.

2.2 Customary Māori

151. There is no allowance currently set for Māori customary fishing. Customary catch in BCO 4 is managed under the Fisheries (Kaimoana Customary Fishing) Regulations 1998. Little customary catch has been reported under these regulations which implies that tangata whenua may have been meeting their needs through the recreational allowance. Given the previously high recreational blue cod daily limit has been reduced, Fisheries New Zealand expects that the reported customary catch will increase significantly from this year-on.

2.3 Recreational

152. There is no allowance currently set for recreational fishing. As a component of the National Blue Cod Strategy, last year the recreational daily bag limit was reduced from 30 to 15 and the minimum legal size limit increased to 33 cm.

153. The National Panel Survey of 2017/18 does not cover the Chatham Islands so does not provide information on BCO 4 recreational catch. The best available information is a recreational fishing survey carried out during the 2008/09 fishing year. The survey included residents, tourist and charter fishing, plus commercial section 111[9] landings. At that time the estimate of recreational harvest was approximately 15 tonnes.

154. Since then, there has been a significant increase in domestic tourism suggesting recreational catch is likely to have increased accordingly.

2.4 All other mortality caused by fishing

155. There is no allowance currently set for all other sources of mortality caused by fishing. The allowance to be set needs to take into account the practice of using blue cod as bait for rock lobster fishing and not reporting it, and that fishers may not always quickly return undersize blue cod to the water, resulting in poor survival. The recent increase in cod pot mesh size (48 mm to 54 mm) as part of the National Blue Cod Strategy is expected, however, to have reduced catches of undersized blue cod. The allowance also needs to take into account predation of returned fish, especially by mollymawks and albatrosses.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

156. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Iwi Fisheries Forums ideally develop 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.[10] Particular regard will be given to kaitiakitanga when making sustainability decisions.

157. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries. The Chatham islands iwi Fisheries Forum – Pā Tangaroa – has not met for some time and the most recent forum document is the "Chatham Islands Fisheries Forum Plan @ 44^{0}".

[8] **Growth overfishing** occurs when fish are harvested at an average size that is smaller than the size that would produce the maximum yield per recruit.
[9] Section 111 of the Fisheries Act 1996 enables commercial fishers to take a recreational catch for their own consumption.
[10] Not all Iwi Fisheries Forums have developed plans at this stage, though work in this area is ongoing.

158. Fisheries New Zealand engages regularly with iwi and imi (Moriori) in terms of BCO 4 and other Chatham Island fisheries. At a Chatham Islands Community Forum hui on 18 March 2020, Fisheries New Zealand sought input from forum members on the proposals in this paper. Further input was sought on the proposed TAC and allowances for BCO 4 from Ngāti Mutunga o Wharekauri and Moriori at the Chatham Island Community Fisheries Forum facilitated by Fisheries New Zealand on 16 November 2020. The Forum supported a reduced allocation to recreational fishing of 10 tonnes.

3.2 Kaitiakitanga

159. Information provided by forums, and imi/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 to fish stocks.

160. Imi/iwi have developed the Chatham Islands Fisheries Forum Plan @ 44^0. Hakoma/rawaru was identified as a taonga species in the fisheries plan.

161. The proposals in this paper in relation to the Forum Fisheries Plan have been discussed with iwi and imi, through the Mandated Iwi Organisation (MIO) chairs and Runanga Managers on the island, as well as Tāngata Kaitiaki. Based on these discussions, Fisheries New Zealand considers that the management options presented in this consultation paper are in keeping with the following objectives of the plan, in particular:

- Kaitiakitanga is fundamental to the management of all fisheries resources;
- Thriving sustainable fisheries are enduring for present and future generations; and
- Fisheries and fisheries areas of cultural significance are protected, maintained and enhanced.

162. Fisheries New Zealand considers that this review contributes to these objectives.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

163. The use of cod pots means the target fishery has little bycatch and few environmental impacts. The method is highly selective with little impact on associated or dependant species. Setting this TAC for BCO 4 will not alter the level of interactions that might occur. As it is not proposed to increase the TACC, there should not be any increase in the effects from fishing.

4.2 Sustainability measures (section 11 of the Act)

164. As there should be no direct change to the level of fishing effort as a result of setting the TAC and allowances there will be no significant changes to the sustainability of the stock and effects on the aquatic environment. However, all fishing mortality will be included within the TAC, providing more explicit consideration of potential sustainability risk.

165. Fisheries New Zealand's Draft National Inshore Finfish Fisheries Plan (2019) provides management objectives and strategies for finfish. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management. Stocks are grouped within the Finfish Plan, with management approaches and objectives tailored accordingly for each group.

166. BCO 4 falls into Group 1, which recognises stocks within this group are highly desirable to all sectors and that we intend to manage it to provide for a high level of certainty of stock status. The National Blue Cod Strategy takes the Group 1 management requirements from the National Inshore Plan and incorporates these into the management objectives and research requirements for the BCO 4 fishery.

167. There is no Regional Coastal Plan in place for the Chatham Islands. Instead the Chatham Island Resource Management Document 2018 is being developed. The plan is only partially operative and provisions that relate to the Coastal Marine Area are not yet operative.

5 Submissions

168. Fisheries New Zealand received ten submissions in response to consultation (Table 2). Generally, recreational submitters considered that as tourism is developing rapidly on the islands, a larger amount should be set for to take into account the demonstrable increase in recreational fishing activity. On the other hand, Te Ohu Kaimoana, and some industry entities (iwi entities) support setting a TAC and the proposed TACC but also favoured a decrease in recreational take.

169. Chatham Islands commercial submitters submitted in favour of Option 1, as did ECO.

Table 2: Written submissions and responses received for BCO 4 (in alphabetical order)

Submitter	Option Support	
	1	Other
Chatham Islands Finfish Association	✓	
Chatham Islands Quota Holding Co.	✓	
Environment and Conservation Organisations of NZ (ECO)	✓	
Chatham Islands Enterprise Trust	✓	
M. Currie		✓ Proposes undefined decrease to recreational allowance, and ban of bottom trawl catch
NZ Recreational Fishing Council		✓ Propose recreational allowance to be set at 40 tonnes
Ngāti Mutunga o Wharekauri Asset Holding Company Ltd		✓ Propose recreational allowance of 10 tonnes
Te Ohu Kaimoana		✓ Propose recreational allowance of 10 tonnes
Te Arawa Fisheries		✓ Support the submission of Te Ohu Kaimoana
Iwi Collective Partnership (ICP)		✓ Support the submission of Te Ohu Kaimoana

6 Options and analysis

170. The current setting for BCO 4 is a stand-alone TACC of 759.339 tonnes. It is our policy to recommend setting a TAC and allowances for stocks which only have a TACC set. As such, we are not proposing the current setting as an option.

6.1 Option 1 - Preferred

TAC: 829.339 t	**TACC:** 759.339 t	**Customary**: 10 t	**Recreational**: 20 t	**Other mortality**: 40 t

171. Only one option was proposed as the purpose of the paper is to set a TAC and allowances.

6.1.1 Total Allowable Catch

172. Option 1 proposes a TAC that retains the current TACC with the addition of allowances based on best available estimates. The fishery has been stable for at least the last ten years at the current level of total removals. The allowances have been estimated using the best available information, including discussion with fishers. All fishing mortality will be included within the proposed TAC, providing explicit consideration of future sustainability risk.

6.1.2 Allowances

Māori Customary

173. Little Māori customary non-commercial catch has been reported to-date. Fisheries New Zealand expects that the reported customary catch will increase significantly from this year-on. Iwi and imi have suggested a figure of 10 tonnes is reflective of their needs and likely take. Based on this information an allowance for customary catch of 10 tonnes is proposed.

174. Submissions and responses received generally supported this proposed allowance.

Recreational

175. The most reliable estimate of recreational harvest is a recreational fishing characterisation and survey specific for the Chatham Islands carried out in 2008/09[11]. This characterisation estimated that approximately 15 tonnes were taken by all recreational fishing across BCO 4 in 2008/09. Residents took almost half of this while visitors took the remainder.

176. Since 2008/09, recreational catch by residents is likely to have remained similar to that estimated in 2008/09. However, catch by visitors to the Chatham Islands is anticipated to have increased as tourist numbers have increased.

177. As noted in more detail in the section below "Other options proposed by submitters", Ngati Mutanga O Wharekauri Asset Holding Co Ltd, Te Ohu Kaimoana, Te Arawa Fisheries the Iwi Collective Partnership and M. Currie support of a decrease in the allowance for recreational fishing. On the other hand, the New Zealand Recreational Fishing Council support an increase.

178. While Fisheries New Zealand acknowledges these views, until such time as the review of recreational catch limits initiated with the Chatham Islands Community Forum has been completed Fisheries New Zealand, considers the allowance for recreational fishing should reflect best available information actual removals from the fishery. Based on this, it is proposed to set an allowance for recreational catch of 20 tonnes.

All other mortality to the stock caused by fishing

179. The allowance for all other sources of stock mortality caused by fishing is proposed to be set at 40 tonnes. Ngati Mutanga O Wharekauri Asset Holding Co Ltd in its submission question this proposed 40 tonne allowance.

180. Fisheries New Zealand notes this allowance takes into account the practice of using blue cod as bait for rock lobster fishing and not reporting and that there is uncertainty regarding the survival of blue cod that is caught but not landed in BCO 4. Fishing practices that do not quickly return undersize blue cod to the water result on poor survivability and predation of returned fish, especially by mollymawks and albatrosses. We also note, on the other hand, that 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 reduced catches of undersized blue cod.

181. Taking this information into account Fisheries New Zealand proposes a proportional allowance be set for BCO 4 of 5% of the TACC. This is higher than that recently set for BCO 5 (Southland) of 2.5% and reflects that fishing practises in these two fisheries differ as described above.

[11] Davey, N.K.; Hartill, B.; Carter, M. (2011). Characterisation of marine non–commercial fishing around the Chatham Islands during the 2008–09 fishing year, including catch estimates for selected species. *New Zealand Fisheries Assessment Report 2011/49*.

6.1.3 Total Allowable Commercial Catch

182. Under Option 1 there is no change to the TACC. The standardised CPUE analysis suggests the commercial fishery is stable at the current level of removals (see Figure 3) and that the current TACC is appropriate. The 2020 Plenary concluded that the stock status in relation to target is likely (>60%) to be at or above the Management Target.

183. The plenary also projected that the current catch and TACC are unlikely (<40%) to cause the stock to decline. Given that the annual CPUE indices from the standardisation model have fluctuated without trend since the late 1990s (Figure 2), this would suggest that at the current total level of all removals from BCO 4, the fishery is stable and sustainable.

184. Submissions and responses received generally supported this proposed TACC.

6.2 Other options proposed by submitters

185. Ngati Mutanga O Wharekauri Asset Holding Co Ltd submitted in support of setting a TAC; however, they also support a reduced allocation to recreational fishing of 10 tonnes and question the 40 tonne allocation for other mortality.

186. Te Ohu Kaimoana's response is in a similar vein, noting that a daily limit of 10 blue cod and an allocation of 10 tonnes was put forward by the Chatham Islands Community Forum.

187. Te Arawa Fisheries and the Iwi Collective Partnership support Te Ohu Kaimoana's response and are concerned that expanding tourist numbers will cause localised depletion of blue cod and other species.

188. M. Currie also submit in support of a decrease in the allocation for recreational interests.

189. On the other hand, the New Zealand Recreational Fishing Council submit that the recreational allowance be increased to 40 tonnes to accommodate the expansion in tourism to the Islands.

190. Fisheries New Zealand acknowledges these concerns and views and is working with the Chatham Islands Community Forum on initiating a review of recreational catch limits applying to a number of species at the Chatham Islands. This process, which is at an early stage, may result in changes to the limits for blue cod, beyond the reduction from 30 to 15 per person per day that occurred last year, but is unlikely to be concluded until next year.

191. In the interim, Fisheries New Zealand, considers the TAC and allowance for recreational fishing should reflect the actual removals from the fishery.

6.3 Deemed values

192. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

193. Section 75 (5) of the Act 1996 allows for a separate interim deemed value rate and an annual deemed value rate in respect of fish, aquatic life, or seaweed landed and received by a licensed fish receiver in the Chatham Islands that is different from the deemed value rate set in respect of fish, aquatic life, or seaweed of the same stock landed and received by a licensed fish receiver elsewhere.

194. As a consequence, BCO 4 has two sets of deemed values, one for blue cod landed on the Chatham Islands (Table 3) and one for blue cod landed to the main-land or trans-shipped (Table 4).

Table 3: Deemed value rates for BCO 4 landed in Chatham Islands from 1 October 2020.

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
BCO 4 (Chatham's)	2.70	3.00	3.60	4.20	4.80	5.40	6.00

Table 4: Deemed value rates for BCO 4 transhipped or landed in mainland NZ from 1 October 2020.

Stock	Interim	Annual 100-110%	Differential rates ($/kg) for excess catch (% of ACE)				
			110-120%	120-130%	130-140%	140-150%	>150%
BCO 4 (Mainland)	3.38	3.75	4.50	5.25	6.00	6.75	7.50

195. In the last five years the average price paid by fishers for BCO 4 ACE has been between $1.03 and $1.21 per one kilogram ($1.18/kg average for the 2020/21 October fishing year so far). The 2020/21 port price index of BCO 4 is $5.46/kg.

196. As the current deemed value rates of BCO 4 (for both Mainland and Chatham's) are set at, or slightly above the average ACE price, Fisheries New Zealand considers the current deemed values regime to be sufficient for incentivising fishers not to catch in excess of their individual annual catch entitlements.

197. In its submission Te Ohu Kaimoana noted that it supported retaining these deemed value settings.

7 Conclusions and recommendations

198. According to the best available information, the BCO 4 fishery is stable at current fishing levels, although overfishing is about as likely as not to be occurring. The proposed TAC takes into account all removals from the fishery, including the current TACC, Māori customary, recreational and other sources of mortality caused by fishing as a basis for setting a sustainable TAC.

8 Decision for BCO 4

Option 1 (Fisheries New Zealand preferred option)

Agree to set the BCO 4 TAC at 829.339 tonnes and within the TAC:

i. Set an allowance for Māori customary non-commercial fishing interests at 10 tonnes;
ii. Set an allowance for recreational fishing interests at 20 tonnes;
iii. Set an allowance for all other sources of mortality to the stock caused by fishing at 40 tonnes;
iv. Retain the BCO 4 TACC at 759.339 tonnes.

Agreed / ~~Agreed as Amended / Not Agreed~~

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Elephant fish (ELE 7) – West Coast South Island. Top of the South

(Callorhinchus milii), silver trumpeter, white fillets, Reperepe, Makorepe

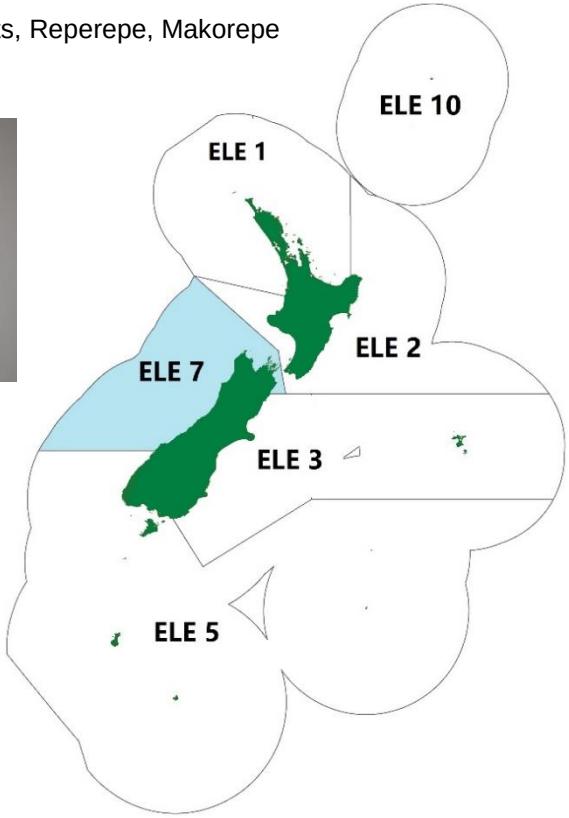

Figure 1: Quota Management Areas (QMAs) for elephant fish (ELE), with ELE 7 highlighted in blue. An elephant fish is pictured on the left.

Table 1: Summary of options proposed for ELE 7 from 1 October 2021. Figures are all in tonnes. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Option 1 *(Status quo)*	127	102	5	10	10
Option 2	138 ↑ (11 t)	112 ↑ (10 t)	5	10	11 ↑
New option incorporated following consultation	No				
Total submissions received	9				
Number of submissions received in support of each option	Option 1	5			
	Option 2	3			
	Other	1 (Seven submitters for the first two options also offered alternative approaches)			

1 Why are we proposing a review?

199. The current TAC and allowances for ELE 7 were set in 2019. The TACC of 102 tonnes was set in 1992 and remained unchanged when the stock was reviewed in 2019. As there have been two further years of catch reported with the TACC fully caught or exceeded it is timely to review the TAC. The stock status is assessed to be at or above the management target with relative

biomass predicted to continue to fluctuate around the target at current catch, and overfishing is about as likely as not (40-60% probability) to be occurring. Recent trawl survey biomass trends for this stock from the West Coast South Island trawl survey have been relatively high compared to the long-term average but are uncertain with a high coefficient of variation. Consideration of all this information, and submitters views, is required to determine if an increase in the TAC is appropriate for this stock.

1.1 About the stock

1.1.1 Fishery characteristics

200. The ELE 7 fishery is located on the north and west coast of the South Island. Commercial set netting restrictions make it predominately a trawl fishery; it is both targeted using this method and also taken as a bycatch of other target species. The TACC has been overcaught several times in the last decade. It is also possible that practises used by the fleet to avoid over-catching elephant fish and management changes in this fishery have biased the catch trends low in this fishery.

1.1.2 Biology

201. Elephant fish live to at least 20 years and reach maturity at about three years (males) to five years (females). Mature elephant fish migrate to shallow inshore waters in spring and aggregate for mating. Eggs are laid on sand or mud bottoms, often in very shallow areas. Females are known to spawn multiple times per season. After egg laying the adults are thought to disperse and are difficult to catch; however, juveniles remain in shallow waters for up to three years. During this time juveniles are vulnerable to incidental trawl capture but are of little commercial value.

202. Elephant fish are an elasmobranch, have low productivity and natural mortality, and therefore can be vulnerable to overfishing.

1.2 Status of the stock

203. The interim management target for ELE 7 is the B_{MSY}[12] proxy based on the mean of the Catch-Per-Unit-Effort (CPUE) series for the period 2007–08 to 2017–18. CPUE is accepted as a suitable index of relative abundance for this stock. Guidance for fisheries management responses when stocks are compared to management targets and reference points are provided in the Harvest Strategy Standard (refer to Section 3 of the Introduction and Legal Overview).

204. In the most recent stock status assessment update (2019), ELE 7 was assessed to be at or above the management target with relative biomass predicted to continue to fluctuate around the target level at current catch. The stock status is also referenced against the associated soft and hard limits, see Figure 2. The overfishing threshold is the mean relative exploitation rate for the period 2007-08 to 2017-18 (Figure 3). Overfishing is about as likely as not (40-60% probability) to be occurring.

205. In addition to CPUE indices, trawl survey biomass trends for this stock are available from the West Coast South Island trawl survey series. These have been relatively high compared to the long-term average but are uncertain with a high coefficient of variation.

[12] The average stock biomass that results from taking an average catch of maximum sustainable yield under various harvest strategies. Often expressed in terms of spawning biomass but may also be expressed as recruited or vulnerable biomass.

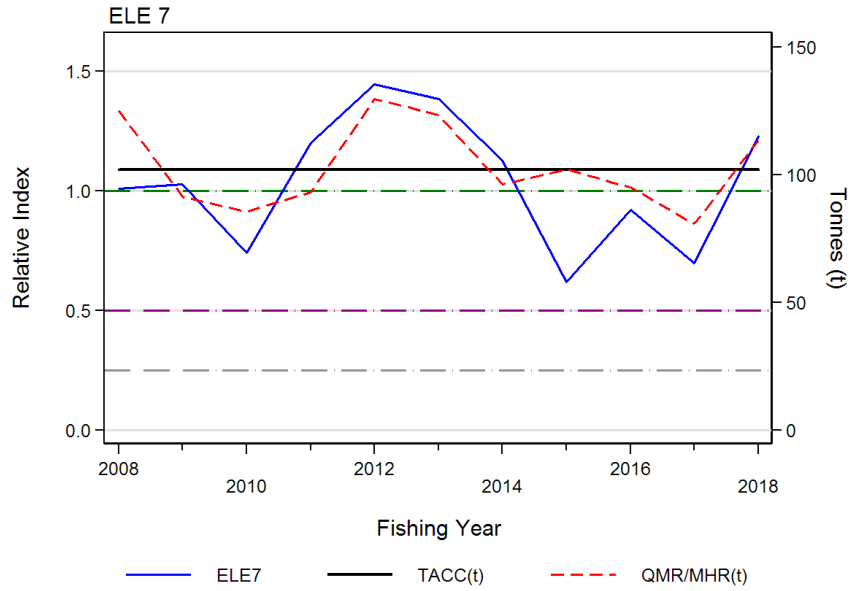

Figure 2: Comparison of the ELE 7 bottom trawl CPUE series with the TACC and commercial landings. The agreed B_{MSY} proxy is shown as a dashed green line; the soft limit is shown as a dashed purple line; the hard limit is shown as a dashed grey line.

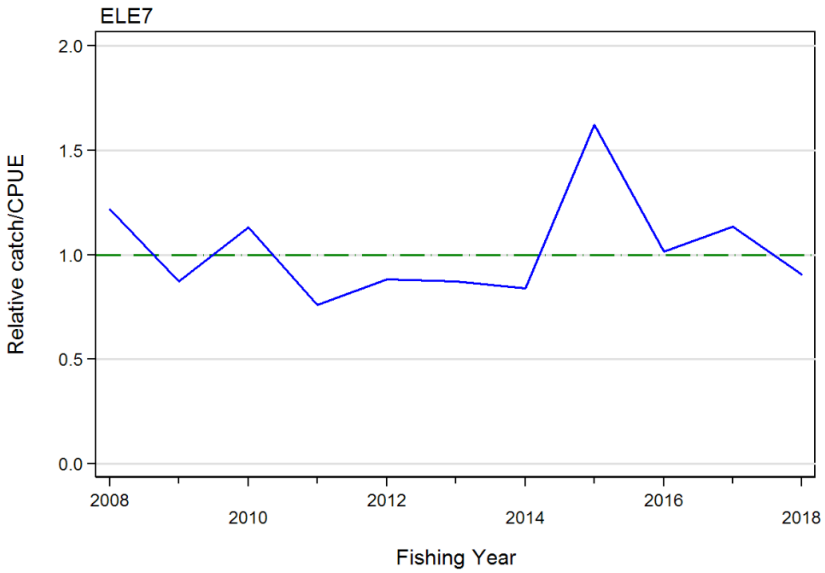

Figure 3: Relative fishing pressure for ELE 7 based on the ratio of commercial landings relative to the ELE 7 bottom trawl CPUE series. Horizontal green line is the geometric mean fishing pressure from 2007–08 to 2017–18.

2 Catch information and current settings within the TAC

2.1 Commercial

206. Since 1 October 2008, commercial set netting has been prohibited to two nautical miles offshore in the western portion of ELE 7, from Awarua Point north of Fiordland to the tip of Cape Farewell at the top of the South Island. This commercial closure is restricted to the period from 1 December to the end of February. From 1 October 2020, commercial set netting has also been banned within Golden and Tasman Bays out to four nautical miles offshore, from Farewell Spit to Cape Soucis (and applies all year round).

207. ELE 7 is taken predominately by bottom trawl along the west coast of the South Island in statistical areas 034, 035 and 036. Trawl target sets for ELE 7 tend to be in shallow water with most catch taken in less than 40 m depth (generally in the 10-11 m, 25-27 m and 34-37 m bands). Elephant fish are also landed as bycatch in a range of other target fisheries including flatfish and red cod.

208. The TACC has been overcaught several times in the last decade (Figure 4).

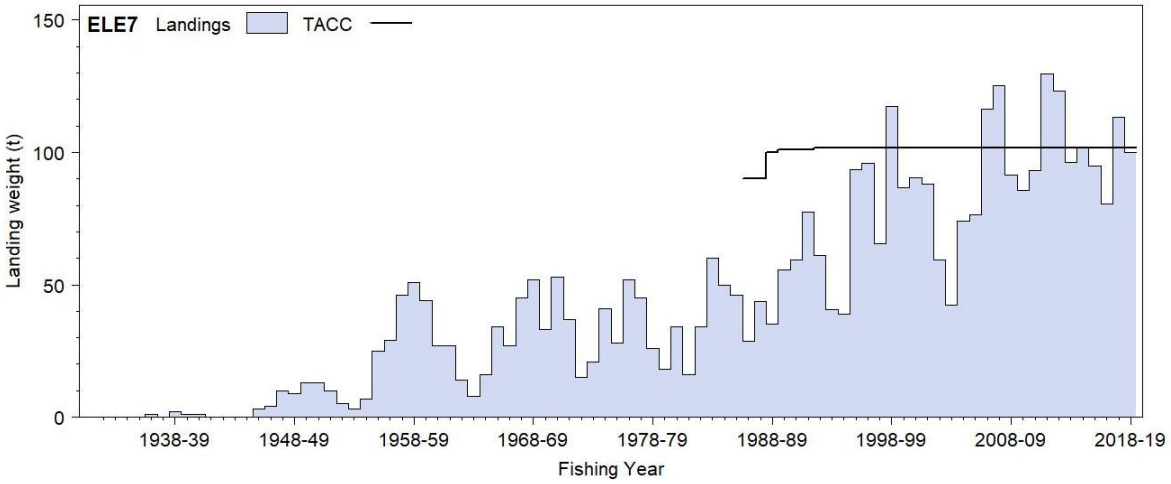

Figure 4: Reported commercial landings and TACC (102 tonnes) for ELE 7.

2.2 Customary Māori

209. The current level of Māori customary catch for finfish in QMA 7 is uncertain. Elephant fish (*Reperepe, Makorepe*) has been reported under the Fisheries (South Island Customary Fishing) Regulations 1999 in past years, but not in the last 10. The absence of customary reporting may reflect that tangata whenua are using recreational fishing regulations for their harvest. Tangata whenua north of Kahurangi Point and in the Marlborough Sounds and Tasman/Golden Bays area are still operating under regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013, which do not require that customary permits or catches be reported. Fisheries New Zealand has received no new information to propose a change to the current customary allowance of five tonnes.

210. There are eight customary management areas in Fisheries Management Area (FMA) 7 (Table 2) that provide for tangata whenua to manage their fisheries under customary fishing regulations and the Act. Commercial fishing is prohibited in mātaitai. There are no regulations relating to elephant fish in the Whakapuaka Taiāpure (just north of Nelson), or bylaws relating to elephant fish in any of the mātaitai.

Table 2: Customary fisheries areas within QMA 7

Name	Management type
Whakapuaka (Delaware Bay)	Taiāpure
Okuru/Mussel Point	
Tauperikaka	
Mahitahi/Bruce Bay	
Manakaiaua/Hunts Beach	Mātaitai Reserve
Okarito Lagoon	
Te Tai Tapu (Anatori)	
Te Tai Tapu (Kaihoka)	

2.3 Recreational

211. Catches of elephant fish by recreational fishers are low compared with those of the commercial sector. Elephant fish are targeted by shore and small craft recreational fishers for food. Catches estimated using National Panel Surveys in 2011–12 and 2017–18 are shown in Table 3 — the estimates are uncertain with a relatively high coefficient of variation. However, regional surveys of recreational fishing in the early 1990s and national surveys in 1996, 1999, and 2000 showed similarly low numbers of fish harvested and similar geographical patterns. No estimates of mean weight from boat ramp surveys are available to convert these estimates of harvested fish to harvested weights (Plenary, 2020). Section 111 catch (recreational catch taken by commercial fishers) is negligible for this fishery.

Table 3: Recreational harvest estimates for ELE 7. Insufficient data on mean fish weights are available from boat ramp surveys to convert numbers to catch weights (Plenary, 2020).

Fish stock	2011/12 Estimated harvest (number of fish)	CV	2017/18 Estimated harvest (number of fish)	CV
ELE 7	960	-	189	0.39

212. Fisheries New Zealand did not propose a change to the recreational allowance of 10 tonnes during consultation. However, Te Ohu Kaimoana has expressed its concern, in response to consultation, that the current allowance is implausibly high based on the National Panel Survey results. This is discussed below in section 6.3 of this stock chapter.

2.4 All other mortality caused by fishing

213. Other mortality caused by fishing in ELE 7 includes mortality associated from fish escaping fishing gear, or illegal discarding. In 2018, the previous Minister of Fisheries indicated a preference for moving toward standardising other mortality caused by fishing for inshore trawl fish stocks, noting that the amount should equate to a minimum of 10% of the stocks respective TACC unless there is evidence to suggest otherwise. The proposed one tonne increase provided in Option 2 retains the other sources of mortality at this standardised approach of 10% of the TACC for ELE 7.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

214. 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 interests in fisheries. Particular regard should be given to kaitiakitanga when making sustainability decisions. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.

215. Te Waka a Māui me Ōna Toka Iwi Forum is the Te Wai Pounamu (South Island) iwi fisheries forum — it includes all nine tangata whenua Iwi of Te Wai Pounamu: Ngāti Apa ki Ratō, Ngāti Kōata, Ngāti Kuia, Ngāti Rarua, Ngāti Tama, Ngāti Tōarangatira, Rangitāne ō Wairau, Te Ati Awa and Ngai Tahu. Their Iwi Fisheries Forum Plan is titled Te Waipounamu Iwi Forum Fisheries Plan.

216. In November 2020, Fisheries New Zealand provided forum members with fisheries management material on the proposed review. No specific input about the proposed changes to ELE 7 has been provided by forum members.

3.2 Kaitiakitanga

217. Elephant fish are identified as 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 2:** South Island Iwi are able to exercise kaitiakitanga;
- **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.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

218. The key environmental interactions with ELE 7, which must be taken into account when considering sustainability measures, concern marine mammals, seabirds, fish and invertebrate bycatch, benthic impacts, habitats of significance and climate change.

219. Habitats of particular significance for fisheries management have not been identified in the area covering the ELE 7 fishery (a research project and associated analysis is scheduled to commence later in 2021 to identify such habitats in the top of the South Island). However, shallow inshore waters are generally important for elasmobranchs during spring when mature elephant fish migrate and aggregate for mating with eggs laid on sand or mud bottoms often in very shallow waters.

Marine mammals

220. In the last five fishing years (to January 2021) there have been no reported or observer-recorded non-fish protected species captures by vessels targeting elephant fish in ELE 7. However, in the period 2015-2020 there has been no observer coverage in ELE 7 (apart from 0.14% of tows observed in the 2017-18 fishing year) [13] , with observer effort prioritised to monitor protected species interactions in fisheries considered to be higher risk. This means that non-fish protected species reporting cannot be independently verified in this fishery.

221. The Hector's and Māui dolphin Threat Management Plan guides management approaches for addressing both non-fishing and fishing-related impacts on Hector's and Māui dolphins. The risk to the dolphins from trawling around the South Island, including FMA 7, is considered low and is largely managed under the current trawl restrictions. As part of the previous Minister of Fisheries decisions on the plan, a new management approach is being considered for Hector's dolphin captures in the South Island areas not closed to set-net or trawl fishing to encourage fishers to avoid all bycatch of Hector's dolphins. Before any formal consultation, Fisheries New Zealand will seek iwi input and participation, and undertake targeted engagement with stakeholders, to inform the development of the proposed approach.

222. Most New Zealand fur seal interactions occur in deeper waters than that for target ELE 7 trawls and therefore the risk of non-reported catch is also considered low for these animals. Sea lions are generally not found as far north as FMA 7.

[13] The percentage of observer coverage is 0.14% for the 2017/18 year and 0% for the other 4 years. The observer coverage percentage was calculated by taking all fisher reported fishing events which reported catching ELE 7 and identifying which of these fishing events were observed. It is important to note, fishers only report the top 5 or 8 species that make up the catch. If ELE 7 was not in the top species, then the event was not included in the percentage coverage calculation. Catch area is determined from the start location of the fishing event.

Seabirds

223. Incidental captures of seabirds occur in some trawl fisheries in FMA 7 (none have been reported in the last five years in trawls targeting ELE 7). Seabird interactions with New Zealand's commercial fisheries are managed under the National Plan of Action - Seabirds 2020. The revised National Plan of Action, with its focus on education and ensuring fishers take all practicable steps to minimise risk to seabirds, will drive significant changes in fisher behaviour and help to ensure that fishing does not adversely impact on the health of seabird populations.

224. Westland petrels have a relatively small breeding population, and a breeding distribution centred on the west coast of the South Island in FMA 7. The most recent seabird risk assessment estimates that fisheries risk to Westland petrels is 'high'. The largest portion of this risk is attributed to inshore trawl fisheries, including inshore trawls targeting elephant fish. However, this portion of the estimated risk is itself highly uncertain reflecting low observer coverage and uncertainty about the contribution of 'cryptic mortality' (i.e. un-observable deaths) to total fisheries risk in inshore trawl fisheries. New research is underway to address these uncertainties.

225. Fisheries New Zealand and the fishing industry have worked collaboratively for over a decade (more recently for the inshore fleet) to promote that vessels have, and follow, a Protected Species Risk Management Plan (PSRMP). A PSRMP specifies the measures that must be followed on board each vessel to reduce the risk of incidental seabird captures. There is no legal requirement that fishers have a PSRMP, however, approximately 90% of full-time fishing vessels in FMA 7 (which includes the west coast where most ELE 7 is caught) do.

Fish and invertebrate bycatch

226. Fish and invertebrate bycatch information for trawl fisheries along the west coast of the South Island is primarily from research trawl surveys. While the trawl surveys are not optimised for elephant fish, bycatch captured during the survey is reflective of the trawlable fish community which occurs within the same depth profile as this species. The 2019 trawl survey captured more than 50 finfish species with many, including spiny dogfish, red cod, barracouta, tarakihi, and hake within the same depth range as elephant fish.

Benthic impacts

227. Research has characterised both New Zealand's benthic environment and the level of benthic impact from fishing activity. There have been a number of studies on the effects of bottom trawling throughout New Zealand but none that are specific to the West Coast of the South Island.

228. Trawling can directly impact on biological diversity of the benthic environment. In statistical areas 034, 035 and 036 (roughly Franz Josef area to Farewell Spit) where the majority of ELE 7 is taken there are several areas closed to commercial fishing and trawling including Westhaven (Te Tai Tapu) Marine Reserve, Kahurangi Marine Reserve and Punakaiki Marine Reserve. Also, within these statistical areas are Te Tai Tapu (Anatori) Mātaitai and Te Tai Tapu (Kaihoka) Mātaitai, which also exclude commercial fishing.

Habitats of significance

229. Habitats of particular significance for fisheries management have not been identified in the area covering the ELE 7 fishery (a research project and associated analysis is scheduled to commence later in 2021 to identify such habitats in the top of the South Island). However, generally shallow inshore waters are important for elasmobranchs during spring, when mature fish migrate and aggregate for mating with eggs laid on sand or mud bottoms in very shallow waters.

Climate change

230. A recent study undertaken by NIWA on climate change and the seafood sector has identified that elephant fish are affected by changes in water temperature (e.g., more vulnerable to changes in larval development and growth rates). Increases in storm frequency and shifts in wind patterns are expected to result in increased coastal sedimentation and turbidity; these environmental factors may reduce elephant fish foraging success and recruitment through impacts on nursery areas.

Impact of proposed options

231. Overall, protected species interactions associated with the fishery under its status quo settings (Option 1) are unlikely to be high given the information set out above, but there is uncertainty in this conclusion given the very low observer coverage in this fishery. We note the area restrictions in the areas where ELE 7 target trawls occur also help to support and maintain biological diversity and reduce interactions. Furthermore, catch records show ELE 7 target trawl catch is a small component of the inshore mixed trawl fishery, equating to approximately 5% of overall catch.

232. Fisheries New Zealand considers the increase proposed under Option 2 is unlikely to significantly change environmental interactions with marine mammals, seabirds, fish and invertebrate bycatch and benthic impacts. The modest TACC increase proposed under this option should not result in a significant change to overall trawl fishing effort in the ELE 7 area, although there may be a small increase in the number of target tows for elephant fish.

4.2 Sustainability measures (section 11 of the Act)

233. There are regional plans in place within ELE 7 to address the cumulative effects of activities in the coastal marine area. Fishers are subject to the rules in the plans (for example, small scale restrictions on fishing methods in ELE 7). The large area of ELE 7 means these rules do not, in general, stop commercial fishers taking their annual catch entitlement (ACE) from other areas within ELE 7.

234. The National Inshore Finfish Fisheries Plan, currently being finalised, provides guidance on management objectives and strategies for finfish stocks such as ELE 7. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management. Stocks are grouped within the plan with management approaches and objectives tailored accordingly for each group. ELE 7 falls into Group 2, which recognises that we intend to manage it to provide for moderate levels of use with moderate levels of information to monitor its stock status (eg, a partial quantitative assessment compared against trends over time).

235. The National Plan of Action for Sharks (NPOA Sharks) is also relevant to elephant fish. As an elasmobranch (cartilaginous fish, including sharks, skates, and rays), elephant fish are included in the plan. The Plan takes into account the biological characteristics of elephant fish in terms of its vulnerability to fishing pressure. One of the goals of the NPOA Sharks is to maintain the biodiversity and long-term viability of New Zealand shark populations, based on a risk assessment framework, including maintaining those species in the QMS at or above target.

5 Submissions

236. Fisheries New Zealand received nine submissions in response to consultation (Table 4). Submissions varied depending on sector. Recreational and environmental interests preferred the status quo as a minimum but also suggested other alternatives. Te Ohu Kaimoana and Industry support an increase but also provided other preferred settings.

Table 4: Written submissions and responses received for ELE 7 (in alphabetical order)

Submitter	Option Support			
	1	2	Other	
D. Mladek			✓	Proposes that no catch limits should be increased at this time
Environmental and Conservation Organisations NZ (ECO)	✓			Recommends a greater precautionary approach for shark species
Fisheries Inshore New Zealand		✓	✓	Supports Southern Inshore Fisheries' submission
Joint submission: LegaSea, NZ Sport Fishing Council, NZ Angling and Casting Association and Marlborough Recreational Fishers Association	✓		✓	Requests improved monitoring of commercial catch, and proposes a minimum legal size for commercial catch
M. Currie	✓		✓	Supports status quo at a minimum, proposes banning trawl and setnet catch
NZ Recreational Fishing Council	✓		✓	Supports status quo, but would prefer other mortality allowance to be 11 tonnes
Forest and Bird NZ	✓			Oppose any increase in the TACC until environmental implications of any such increase are assessed properly
Southern Inshore Fisheries (SIF)		✓	✓	Would prefer larger TACC increase
Te Ohu Kaimoana		✓	✓	Generally support Option 2, but ask that recreational allowance is lowered to 5 tonnes

6 Options and analysis

6.1 Option 1 (*status quo*)

TAC: 127	**TACC:** 102	**Customary**: 5	**Recreational**: 10	**Other mortality**: 10

237. Option 1 retains the current TAC and other settings. It places the greatest weight on the biological vulnerability of elephant fish to overfishing and does not provide for any increase in utilisation of elephant fish in ELE 7.

238. The last assessment (2019) based on information up to 2018 has the stock at or above target, and as likely as not to be overfished. Relative biomass is predicted to continue to fluctuate around the target level at the current catch. While there are indicators that abundance may have increased in recent years this has either already been taken into account in the 2019 stock assessment, or the information is uncertain and inconclusive (for example, trawl survey biomass estimates and catch information since 2019). Therefore, there is insufficient data to conclude that biomass has increased since the last stock assessment.

239. Given the vulnerability to overfishing of elephant fish, lack of observer coverage in this fishery and information on environmental interactions, retaining the status quo is the preferred option of recreational fishers and environmental groups.

240. In particular, the Environment and Conservation Organisation of NZ (ECO) recommends a precautionary approach to fisheries management for shark species, and notes the lack of observer coverage on inshore vessels that it considers undermines the management and monitoring regime. ECO also notes that habitats of particular significance to fisheries management have not been identified, maintenance of biological diversity has not been given effect nor is there a strategy to avoid, remedy or mitigate the impacts of bottom fishing. For these reasons, ECO does not support an increase in the catch limits for ELE 7.

241. New Zealand Forest and Bird considers the information in the consultation document regarding environmental interactions was misconceived because it compared the level of anticipated fishing effort with the level of current fishing effort and did not adequately assess the

sustainability of current fishing effort in relation to the environmental principles of the Act (therefore, making it difficult for them to draw any conclusions in relation to sustainability of an increase in fishing effort). In particular, the level of observer coverage was not given nor the spatial distribution of observer coverage or the reliability of self-reporting. On this basis Forest and Bird opposes any increase in the TACC until the environmental implications of any such increase are properly assessed.

242. In a subsequent letter from New Zealand Forest and Bird after consultation had closed, these concerns regarding the very low levels of observer coverage (0.14% or less) in this fishery were again highlighted. New Zealand Forest and Bird considers the consultation document was misleading and requested ELE 7 be removed from the current round until a proper risk assessment was completed on bycatch of non-target species.

243. As noted, Fisheries New Zealand considers environmental interactions associated with the fishery are unlikely to be high for ELE 7, particularly, given it is a relatively small fishery compared with other target trawl fisheries in FMA 7, and there are regulatory and non-regulatory measures in place to mitigate environmental interactions. However, there is uncertainty in this conclusion, given the lack of observer coverage in this fishery. We acknowledge that Option 1 has lower risk of interactions with marine mammals, seabirds, fish and invertebrate bycatch and benthic impacts than Option 2.

244. Joint submitters LegaSea, NZ Sport Fishing Council, NZ Angling and Casting Association and Marlborough Recreational Fishers Association support Option 1 and ask you to direct Fisheries New Zealand to monitor commercial catch, collect biological parameters from shed sampling, and use observer coverage or cameras to quantify discard rates. They also ask that a minimum legal size to the commercial catch of elephant fish be applied (we note that such a change was not part of consultation).

6.2 Option 2

TAC: 138 ↑ (11 t)	**TACC:** 112 ↑ (10 t)	**Customary**: 5	**Recreational**: 10	**Other mortality**: 11 ↑

245. Option 2 provides an increase to the TAC of 11 tonnes, an increase to the TACC by 10 tonnes (10%), maintains customary and recreational allowances, and increases other mortality caused by fishing by one tonne.

246. Other mortality caused by fishing in ELE 7 includes mortality associated from fish escaping fishing gear, or illegal discarding. The proposed one tonne increase retains the other sources of mortality at the standardised approach of 10% of the TACC for ELE 7.

247. Option 2 provides for additional utilisation by the commercial sector and greater derived value from the fishery, at least in the short term. An increase of 10% to TACC would have the effect of allowing fishers to balance non-target ELE 7 catch through additional ACE. The 2019/20 fishing year was 107% caught.

248. The estimated short-term economic value of Option 2, based on 2020/21 port prices, suggests an additional $19,600 value (primarily in the domestic market). Port price is what the commercial fisher receives, not what the fish is worth at market (which is higher). Nor does it reflect the income for Licensed Fish Receivers (including, wholesalers and/or processors) and retailers.

249. Option 2 does not impact on, and is not impacted by, the customary management areas in ELE 7. Commercial fishing is prohibited in the mātaitai reserves and the Whakapuaka (Delaware Bay) taiāpure has no regulations restricting the harvest of elephant fish and is not located in area of high ELE 7 target trawls.

250. Option 2 may better contribute towards the achievement of the Te Waipounamu Iwi Forum Fisheries Plan management objectives through additional potential economic gains.

251. One of the goals of the NPOA Sharks is to maintain the biodiversity and long-term viability of New Zealand shark populations, based on a risk assessment framework, including maintaining those species in the QMS at or above target. This option carries a greater risk of moving the stock below target than Option 1.

252. Section 13 (2) of the Act provides that you shall set a TAC that maintains the stock at or above maximum sustainable yield (*MSY*) having regard to the interdependence of the stocks. Relative biomass of ELE 7 is predicted to fluctuate around the target level at the current catch; under these circumstances frequent stock assessments or harvest control rules are required for responsive management. At this stage, a harvest control rule is not in place, the trawl survey indices are unreliable for this stock, and ELE 7 is not a high value stock that warrants frequent stock assessments.

253. Industry and Te Ohu Kaimoana both support an increase in the TACC and consider that indicators of abundance have increased in recent years. Industry supports an increase in the TACC but requests more than the 10 tonnes proposed in Option 2 (discussed further below).

254. Te Ohu Kaimoana supports an increase of 10 tonnes to the TACC and considers a utilisation opportunity exists. It supports an approach that manages stocks in mixed fisheries together and believes when ELE 7 was reviewed with other stocks in the mixed trawl fishery (GUR 7, SPO 7, JDO 7 and ELE 7) in 2019 that ELE 7 should have been increased with SPO 7 as the two species are caught together.

255. Fisheries New Zealand, in weighing up the risks and benefits of this option, considers the information that abundance may have increased in recent years is uncertain and inconclusive. Overall, there is insufficient data to conclude that biomass has increased since the last stock assessment in 2019. If you did choose to increase the TACC of ELE 7, Fisheries New Zealand would need to work closely with Industry to commission a new assessment of the stock status to monitor the impact of increasing the TACC to ensure the stock is maintained at the target and that the stock is not overfished.

6.3 Other options proposed by submitters

256. M. Currie supports decreases to settings, or at a minimum retain the status quo, and considers trawling and set nets should be banned given the lack of a management plan and a full stock assessment for ELE 7. ELE 7 is considered a Group 2 stock under the Draft Inshore Finfish Fisheries Plan, which recognises that moderate levels of information (eg, Standardised CPUE indices) rather than a full stock assessment are appropriate to monitor the stock status of ELE 7.

257. New Zealand Recreational Fishing Council supports retaining the status quo given the uncertainty surrounding the vulnerability of elephant fish to overfishing and its preference for all fisheries to be managed at or above 40% biomass. It does, however, support increasing the allowance of other mortality caused by fishing to 11 tonnes. As mentioned, the appropriate setting for other sources of mortality in inshore trawl fisheries is considered to be 10% of the TACC unless there is information otherwise. Fisheries New Zealand has no information to suggest that other sources of mortality for this fishery should be either side of 10% and recommends the current allowance be retained under Option 1.

258. Southern Inshore Fisheries Management agrees with the increase to the TACC for ELE 7 but considers that the increase should be at least 50 tonnes rather than the 10 tonnes proposed. Industry notes a larger increase provides for continued utilisation over the medium-term and reduces the impact of incurring deemed values. It does not support standardising other mortality caused by fishing allowance for trawl fisheries rather it supports reporting of all fish including those not landed. Fisheries New Zealand has noted Industry's comments regarding other mortality caused by fishing and notes there are various initiatives underway to look at this issue.

259. Te Ohu Kaimoana has provided an alternative option where the recreational catch allowance reflects the low recreational catch estimates from the last two National Panel Surveys.

Fisheries New Zealand acknowledges Te Ohu Kaimoana's concerns and the limited recreational catch information for this fishery. The National Panel Surveys provide the best available information on recreational catch with the last one being completed in 2017/18. The TAC and allowances for ELE 7 were set in 2019, based on estimated levels of recreational catch across all ELE stocks, with no submissions received regarding alternative methods for setting the recreational allowance at that time. Noting Te Ohu Kaimoana's concerns, Fisheries New Zealand will seek to obtain better data (including mean fish weights from observer and trawl survey data) on recreational catch in this fishery for future review. Any changes to the recreational catch can then be appropriately consulted on.

6.4 Other considerations

260. As mentioned above, Joint submitters LegaSea, NZ Sport Fishing Council, NZ Angling and Casting Association and Marlborough Recreational Fishers Association have requested a minimum legal size to the commercial catch of elephant fish be applied. However, the introduction of the minimum legal size was not consulted on and is outside the scope of this review.

261. Joint submitters and New Zealand Forest and Bird have requested better monitoring of commercial catch and raised concerns about full disclosure of information in consultation documents. Fisheries New Zealand has noted these and the wider concerns regarding monitoring and validation of catch reporting. New Zealand Forest and Bird's concerns about disclosure of observer coverage are highlighted in the environmental interactions section of this paper for your consideration rather than deferring to provide advice on the review of ELE 7.

6.5 Deemed values

262. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

263. ELE 7 deemed values are set at a standard differential rate (see Table 5 below) which means that the annual rate increases for higher levels of excess catch (also known as ramping).

Table 5: Current deemed value rates ($/kg) for ELE 7

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
ELE 7	1.50	1.65	1.98	2.31	2.64	2.97	3.30

264. According to data from 2020/21, the current deemed value rates of ELE 7 currently fall between the average ACE price ($0.70/kg) and port price ($1.96/kg).

265. As the current deemed value rates are set at, or slightly above the average ACE price, Fisheries New Zealand considers the current deemed values regime to be sufficient for incentivising fishers not to catch in excess of their individual annual catch entitlements.

266. Te Ohu Kaimoana responded to consultation advising it considers the ramping of deemed values should be removed to incentivise accurate reporting. However, the annual deemed value rate is lower than the current port price. Furthermore, ELE 7 deemed values are similar to other elephant fish stocks and consideration should therefore be given to whether there is reason to review the deemed values for elephant fish across all stocks.

7 Conclusions and recommendations

267. The most recent stock status assessment assessed ELE 7 to be about as likely as not to be about at or above target with overfishing about as likely as not (40-60% probability) to be occurring. Best available information from monitoring trends in ELE 7 stock abundance predicts relative biomass will continue to fluctuate around the target level at current catch. Furthermore, recent trawl survey biomass trends for this stock from the West Coast South Island trawl survey have been relatively high compared to the long-term average; however, these estimates are uncertain with a high coefficient of variation.

268. Fisheries New Zealand received feedback from nine individuals or organisations to the two options (the status quo and an increase in TACC) provided in consultation. Feedback varied depending on sector. Recreational and environmental interests preferred the status quo as a minimum but also suggested other alternatives. Te Ohu Kaimoana and Industry support an increase but also provided other preferred settings.

269. Depending on the weight you place on uncertainty and managed risk both options provide alternative management approaches. Option 1 retains the current TAC and other settings. It places the greatest weight on the biological vulnerability of elephant fish to overfishing. It has a marginally lower risk of increasing the environmental interactions of marine mammals, seabirds, fish and invertebrate bycatch and benthic impacts in this target and bycatch fishery.

270. Option 2 provides a greater risk of moving the stock below the management target and increasing the risk of overfishing. Under this option, ongoing monitoring of the stock status would be prioritised and any future review of ELE 7 implemented swiftly to maintain ELE 7 at or above target and to prevent overfishing.

271. Fisheries New Zealand considers that both options meet the purpose and principles of the Fisheries Act 1996 (the Act). On balance, given the stock status is at or above target, is vulnerable to overfishing, and overfishing is about as likely as not to be occurring and taking into account the information and views received during consultation, Fisheries New Zealand's preferred option is to retain the status quo (Option 1).

8 Decision for ELE 7

272. Fisheries New Zealand notes that you have broad discretion in exercising your powers of decision making and may make your own independent assessment of the information presented to you in making your decision. You are not bound to choose the options provided below by Fisheries New Zealand.

Option 1 (Fisheries New Zealand preferred option)

Agree to retain the ELE 7 TAC at 127 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 5 tonnes;
ii. Retain the allowance for recreational fishing interests at 10 tonnes;
iii. Retain the allowance for all other sources of mortality to the stock caused by fishing at 10 tonnes;
iv. Retain the ELE 7 TACC at 102 tonnes.

Agreed / ~~Agreed as Amended / Not Agreed~~

OR

Option 2

Agree to set the ELE 7 TAC at 138 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 5 tonnes;
ii. Retain the allowance for recreational fishing interests at 10 tonnes;
iii. Increase the allowance for all other sources of mortality to the stock caused by fishing from 10 to 11 tonnes;
iv. Increase the ELE 7 TACC from 102 to 112 tonnes.

~~Agreed /~~ Agreed as Amended / Not Agreed

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

yellow-belly flounder, *Rhombosolea leporine* (YBF);
sand flounder, *Rhombosolea plebeian* (SFL);
black flounder, *Rhombosolea retiaria* (BFL);
greenback flounder, *Rhombosolea tapirina* (GFL);
lemon sole, *Pelotretis flavilatus* (LSO);
New Zealand sole, *Peltorhamphus novaezeelandiae* (ESO);
brill, *Colistium guntheri* (BRI);
turbot, *Colistium nudipinnis* (TUR).

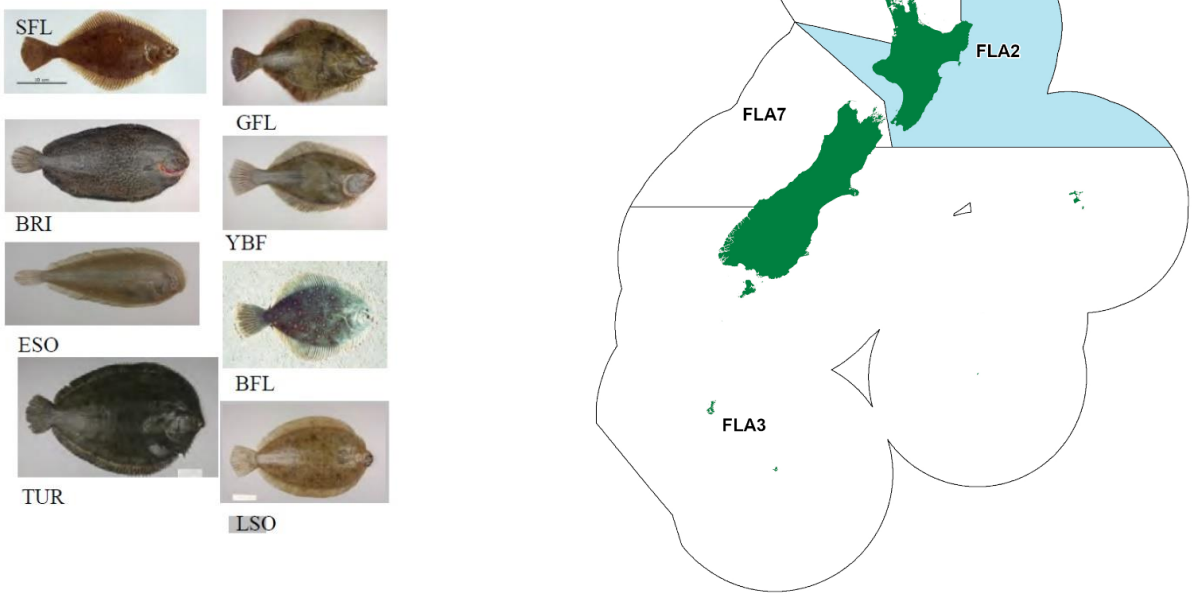

Figure 1: Quota Management Areas (QMAs) for flatfish (FLA), with FLA 2 highlighted in blue. Flatfish species are pictured on the left.

Table 1: Summary of options proposed for FLA 2 from 1 October 2021. Figures are all in tonnes. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current Settings *(Status quo)*	-	726	-	-	-
Option 1	782	726	10	10	36
Option 2	230	200 ↓ (526 t)	10	10	10
Option 3	163	136 ↓ (590 t)	10	10	7
Option 4	178	150 ↓ (576 t)	10	10	8

New option incorporated following consultation	Yes, Option 4	
Total submissions received	10	
Number of submissions received in support of each option	Option 1	0
	Option 2	1
	Option 3	3
	Option 4	3
	Other	3

1 Why are we proposing a review?

273. Fisheries New Zealand is proposing that you review sustainability measures for the FLA 2 flatfish stock for the 1 October 2021 fishing year.

274. FLA 2 is a shared fishery, targeted by customary Māori, recreational, and commercial fishers. When the stock was introduced to the QMS in 1986 only a TACC was set, this was set relative to the highest catches on record. Since then, this level of commercial catch has not been reached.

275. Best available information indicates that FLA 2 abundance has fluctuated around the management target indicating that the stock is currently performing at a sustainable level. Given that the TACC is set much higher than current catch levels, there is uncertainty as to whether catch at that level of the TACC would be sustainable. This, coupled with declining commercial effort and stakeholder concerns regarding environmental factors, has prompted Fisheries New Zealand to review this stock.

276. In undertaking this review, Fisheries New Zealand is proposing you set a TAC for FLA 2 and reduce the TACC. This will include the setting of allowances for customary and recreational fishers, as well as other sources of mortality caused by fishing for the first time.

1.1 About the stock

1.1.1 Fishery characteristics

277. Target commercial fishing for FLA 2 is mainly confined to the inshore domestic trawl and set net fleet. Commercial catch effort data indicates this fleet makes up 76% of all commercial flatfish take, with 87% of this attributed to bottom trawl.

278. There are three main areas of commercial interest in FLA 2, the Hawke's Bay where bottom trawl is the predominant fishing method and the Wellington Harbour and Manawatu River mouth where set netting is the predominant method. FLA 2 catch comprises mainly sand flounder and New Zealand sole.

279. Flatfish bycatch in FLA 2 mainly occur from the targeting of gurnard, snapper and trevally. Other small quantities of bycatch are caught by offshore trawlers and include soles, brill and turbot.

280. Flatfish are also an important species to customary and recreational fishers. Recreational catch is predominantly caught via netting and hand gathering from shore. Customary take of flatfish is largely unknown, however, flatfish are considered an important taonga species to many iwi.

1.1.2 Biology

281. Flatfish are shallow water swimmers found in inshore areas such as estuaries, mudflats, and sand flats. There are eight species of flatfish[14] and, for management purposes, the commercial landing codes for these species are combined into the flatfish complex code FLA.

282. Most of these flatfish species are fast-growing and short-lived, generally only surviving to three to four years of age, with very few reaching five to six years. Brill and turbot are longer lived, reaching a maximum age of 21 years and 16 years, respectively. Flatfish move offshore for first spawning at two to three years of age during winter and spring.

283. Flatfish stocks are highly variable, meaning that abundance can fluctuate substantially year to year. Because of this flatfish have been listed in Schedule 2 of the Fisheries Act 1996. Schedule 2 allows that, for certain "highly variable" stocks, TAC can be increased within a

[14] The eight species are: yellow-belly flounder, *Rhombosolea leporine* (YBF); sand flounder, *Rhombosolea plebeian* (SFL); black flounder, *Rhombosolea retiaria* (BFL); greenback flounder, *Rhombosolea tapirina* (GFL); lemon sole, *Pelotretis flavilatus* (LSO); New Zealand sole, *Peltorhamphus novaezeelandiae* (ESO); brill, *Colistium guntheri* (BRI); and turbot, *Colistium nudipinnis* (TUR).

fishing season. Increased commercial catch is provided for through the creation of additional 'in-season' ACE.

1.2 Status of the stock

284. The abundance of the FLA 2 fishery is assessed based on analysis of commercial Catch-Per-Unit-Effort (CPUE) information for the target bottom trawl flatfish fishery. This assessment is undertaken in the east coast portion of FLA 2 (Hawke Bay and Wairarapa Coast) using commercial catch and effort data. The most recent CPUE update for FLA 2 occurred in 2018 and informs a CPUE series dating back to 1989/90.

285. An agreed B_{MSY}[15] compatible target proxy has also been established based on the mean CPUE over the period from 1989/90 to 2012/13. This includes a soft limit of 50% of target, a hard limit of 25% of target and an overfishing threshold of F_{MSY}[16].

286. The 2018 update to the CPUE index is shown by the black solid line in Figure 2 and indicates that the relative abundance of flatfish has fluctuated around the target and without trend since 1989/1990 and has slightly dipped below the target in the most recent year of the series. Current projections also indicate that the stock is likely to fluctuate around current levels, based on current catch.

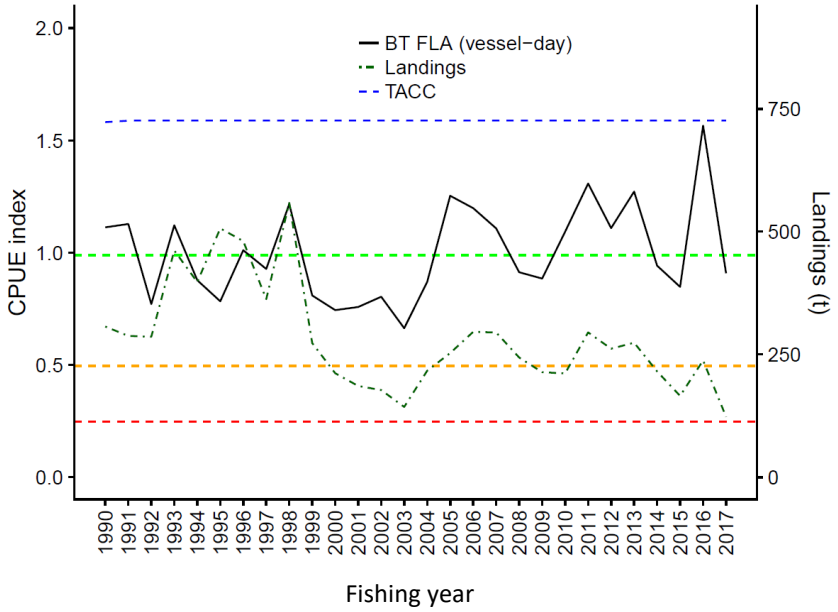

Figure 2: The accepted CPUE index for FLA 2 relative to the target (green), the soft limit (orange) and hard limit (red), together with the TACC and landings.

287. Since the mid-1990s, fishing mortality and the exploitation rate (fishing intensity) of flatfish has trended downwards. Fishing intensity is currently below the 1990-2013 average and has been since 2000 (see Figure 3). This likely indicates a shift in fishing behaviour which could be due to a range of factors such as effort moving away from targeting flatfish and towards more lucrative species, or a general decline in the numbers of fishers in the fleet.

[15] B_{MSY}: The average stock biomass that results from taking an average catch of Maximum Sustainable Yield (*MSY*) under various types of harvest strategies. Often expressed in terms of spawning biomass, but may also be expressed as recruited or vulnerable biomass.
[16] F_{MSY}: The fishing mortality rate that, if applied constantly, would result in an average catch corresponding to the *MSY* and a B_{MSY}. Usually expressed as an instantaneous rate.

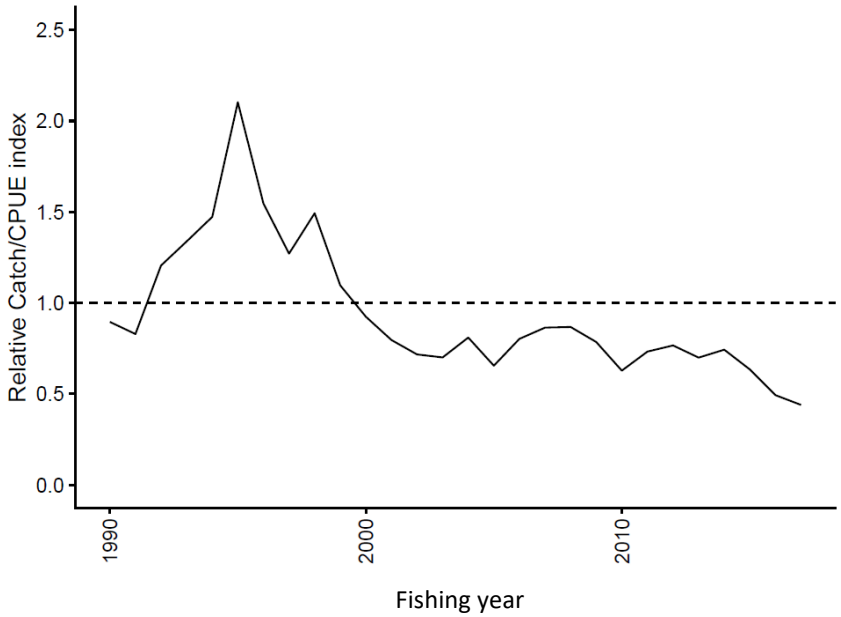

Figure 3: The relative exploitation rate (catch/CPUE) for FLA 2 standardised to a mean of one over the reference period 1990-2013.

288. The Plenary gives FLA 2 an overall assessment quality rank of “High Quality”, but noted that the probability of the current catch or TACC causing biomass to remain below or to decline below the hard or soft limit to be “unknown” for the TACC and “unlikely” for current catch.

289. Flatfish are reported as a combined species. However, this does not accurately reflect the abundance or biological status of individual species. This is problematic for certain species in certain areas such as the black flounder, an important taonga species in the Hawke’s Bay. The relative abundance of flatfish is estimated using the most prolific species and this has the effect of masking relative abundance of less prolific species.

2 Catch information and current settings within the TAC

2.1 Commercial

290. Commercial reporting data including catch estimates, fishing effort data and landing information provide information on commercial catch trends.

291. The commercial catch history of FLA 2 is illustrated in Figure 4 below and shows a gradual decline in commercial catch since 1995, generally fluctuating between 200 and 300 tonnes. In the last five years, however, the average annual catch has occurred at lower levels (on average 152 tonnes).

292. Analysis of the fisheries data does not include the 2019/20 fishing year, which has been excluded due to the potential effects of COVID-19 and the lockdown periods. The COVID-19 global pandemic has had significant impacts on New Zealand’s fishing industry, notably a drop in fishing effort, resulting in commercial catch being lower than previous years. This data point has therefore been excluded to better reflect catches under “normal” circumstances.

293. There are various factors that can influence whether a TACC is fully utilised and fishers are not obliged to catch their entitlement in full. This can be related to a change in abundance but also market factors (for example, ACE availability and market demand for the fish).

294. It is not clear what factors are driving lower commercial catch rates. The port price paid for FLA 2 has remained relatively high, fluctuating between $2 - $5 with a general increasing trend since 1996 (also shown in Figure 4). This indicates that port price is not an influencing factor in the trend of declining catch levels.

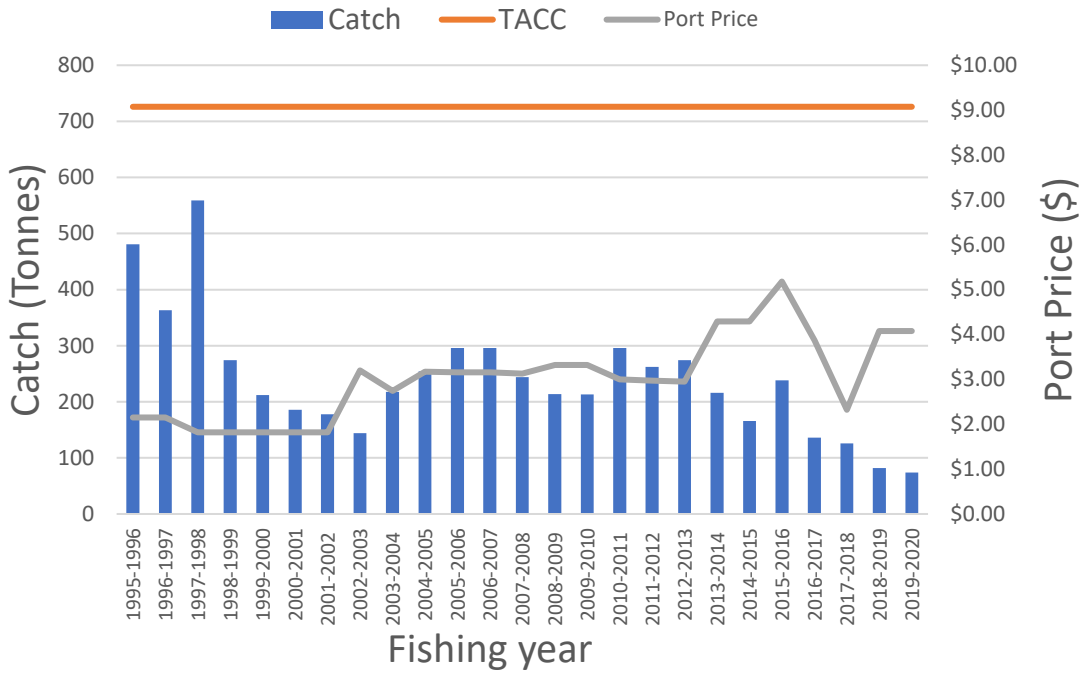

Figure 4: Annual catch in tonnes of flatfish since 1995 (blue bars), with the TACC indicated in orange. Port price is overlaid in grey.

2.2 Customary Māori

295. Current customary reporting for flatfish in FLA 2 is incomplete. The incompleteness of customary reporting information is because large areas of FLA 2 have yet to be gazetted as rohe moana under the customary regulations. In these areas, customary catch is likely taken under regulations 50 and 51 of the Fisheries Amateur Fishing Regulations 2013, which do not have reporting requirements. We also note that customary fishers may simply be fishing under the recreational bag limits.

296. Only 13 reported customary authorisations for FLA 2 have been reported over the last 10 years and based on this information alone customary catch would be less than one tonne annually. Fisheries New Zealand considers that current information on customary catch may not appropriately reflect the true take of flatfish for customary purposes. Submissions relating to customary allocations reflect this position.

297. Mātaitai reserves, taiāpure and temporary closures are customary management tools that also provide for kaitiakitanga. There are six mātaitai reserves (where commercial fishing is not permitted) and two taiāpure within FLA 2 (Table 2). Outside of the broad prohibition on commercial fishing activity within mātaitai reserves, none of these customary management areas have any specific restrictions on the taking of flatfish. You are required to take these into account when making allowances for customary non-commercial fishing interests.

Table 2: Customary fisheries areas within FLA 2.

Name	Management type
Hakihea Mātaitai	Mātaitai Reserve
Horokaka Mātaitai	
Toka Tamure Mātaitai	
Te Hoe Mātaitai	
Moremore Mātaitai(a)	
Moremore Mātaitai(b)	
Porangahau Taiāpure	Taiāpure
Palliser Bay Taiāpure	

2.3 Recreational

298. The National Panel Survey of Marine Recreational Fishers 2017-18 (NPS) highlights the importance of flatfish to the recreational sector. The NPS reports that flatfish are taken from most areas around New Zealand, with 23% of recreational catch taken from FLA 2.

299. Flatfish are caught by a variety of methods with netting being the most frequent (63%). Approximately 53% were recorded as being caught from the shore (including 'hand gathering from shore') which is distinct from most other finfish species, where catch by boat is predominant. Spearfishing accounted for 12% of catch, but it is likely much of this would have been caught via handheld spear (and should more accurately be counted as floundering from shore/hand gathering).

300. The primary management tools used to manage recreational harvest of flatfish are a Minimum Legal Size (MLS) and daily bag limit. General spatial and method restrictions also apply, particularly to the use of set nets. The flatfish MLS for recreational fishers is 25 cm for all species, except sand flounder for which the MLS is 23 cm. Fishers can take up to 20 flatfish as part of their combined daily bag limit in the Central Fishery Management Area.

301. The best available information on current recreational catch is from the 2017/18 NPS, which estimated the total recreational catch of flatfish in FLA 2 to be 9.1 tonnes (± 3.7 tonnes), totalling approximately 22,324 fish. Submissions relating to recreational harvest suggest this may underestimate recreational catch. Fisheries New Zealand acknowledges that recreational harvest will fluctuate from year to year but considers this to be the best available estimate.

2.4 All other mortality caused by fishing

302. The allowance for all other mortality caused by fishing is intended to provide for unrecorded mortality of fish associated with fishing, including incidental mortality from fishing methods or illegal fishing.

303. FLA 2 does not currently have an allowance for other sources of mortality caused by fishing. By comparison, the other flatfish stocks either do not have an allowance set (FLA 7 and FLA 10) or have an allowance that equates to around two percent of TACC (FLA 1 and FLA 3).

304. The previous Minister indicated a preference for standardising the other sources of mortality allowance for inshore trawl fish stocks at an amount that equates to 10% of the TACC, unless there is evidence to suggest otherwise.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

305. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Iwi Fisheries Forums ideally develop 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.[17] Particular regard will be given to kaitiakitanga when making sustainability decisions. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.

306. The proposal to review FLA 2 has been discussed with the Mai Paritu tai atu ki Turakirae Fisheries Forum (Mahia to Wairarapa) and Te Tai Hauāuru (Taranaki to Kāpiti).

307. The Mai Paritu tai atu ki Turakirae Fisheries Forum noted the potential need for a decrease in TACC and provided feedback regarding environmental impacts and the need to work with councils to solve water quality issues.

[17] Not all Iwi Fisheries Forums have developed plans at this stage, though work in this area is ongoing.

308. The Te Tai Hauāuru Fisheries Forum supported the setting of a TAC and associated allowances for customary and recreational fishers. It was noted that there was a substantial customary fishery for pātiki both in the river estuaries in the region and along the beaches from Kāpiti to Whānganui. The concentration of fishing in these areas exposed this fishery to the environmental effects of land-based activities in the river catchments and adjacent coasts. The forum noted that sedimentation in the Manawatu was a problem, stating that toxic algal and other discharges from the rivers are likely to have adverse effects for the fishery. The forum did not comment specifically on what the TACC should be or settings for the allowances.

3.2 Kaitiakitanga

309. 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 to fish stocks.

310. Flatfish (pātiki) are valued taonga species for tangata whenua and have traditionally been a popular source of food that can be easily caught by netting and spearing. The flatfish and flounder species included under the QMS code of FLA 2 have been identified generally as taonga species under the Iwi Forum Fisheries Plan of Te Tai Hauāuru.

311. The Mai Paritu tai atu ki Turakirae forum does not yet have an Iwi Fisheries Plan, though flatfish are highly likely to be considered taonga. This is evident through an initiative being undertaken by a member of the Kohupātiki Marae near Clive who wanted a survey to better understand the existing population of pātiki, or black flounder, in the Clive River, which is still referred to by its traditional name, Ngaruroro Tawhito.

312. Fisheries New Zealand considers that the management options presented in this consultation paper are in keeping with the objectives of relevant Iwi Fisheries Plans which generally relate to the maintenance of healthy and sustainable fisheries.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

313. Flatfish are predominantly taken by target bottom trawl and set net activity in FMA 2. The key environmental interactions within this fishery concern marine mammals, seabirds, fish and invertebrate bycatch and benthic impacts, which must be accounted for when considering sustainability measures.

314. Fisheries New Zealand notes that environmental factors, such as the decline in water quality (through temperature changes, reduced oxygen levels and sediment deposition from runoff) in enclosed bays and sheltered harbours, may be affecting flatfish recruitment. Fisheries New Zealand is also aware of dredging being undertaken in the Port of Napier which may re-distribute previously buried heavy metals throughout the water column. Fisheries New Zealand does not have a direct role in managing these environmental impacts. Nonetheless, Fisheries New Zealand monitors these activities and where necessary advocates for approaches and practices that mitigate impacts on fish species and the habitats they depend on.

315. Fisheries New Zealand is involved in the multi sector-multi agency Hawkes Bay Marine and Coast Advisory Group (HBMaC). One key priority of this group is understanding of seafloor sediment dynamics (including their origin, impact on the seafloor, and potential for resuspension) and the status of seafloor habitat structure.

316. In December 2020, Fisheries New Zealand also attended an *"Extraordinary meeting on the Clive River Dredging project"* hosted by the HBMaC. During this meeting, Fisheries New Zealand highlighted the importance of flatfish to the area and noted that water quality can be a significant factor that can affect the sustainability of the flatfish fishery and future recruitment. Fisheries New Zealand also raised concerns that the proposed ocean-based disposal of sediment from the Clive River will put additional stress on the flatfish fishery in the area.

Marine mammals

317. The proposed changes to the TAC and TACC for flatfish are unlikely to result in any change to the current amount of fishing effort. Furthermore, in the last five fishing years (to the end of September 2020) there has been no reported non-fish protected species captures recorded by vessels targeting flatfish. The risk of the presented options increasing the adverse effects on marine mammals is considered low.

318. FLA 2 encompasses areas associated with multiple marine mammal species including the Māui dolphin (on the West Coast of the North Island). Marine mammal interactions are reported by fishers or on-board observers and are closely monitored by Fisheries New Zealand. The residual risk to the Māui dolphin from trawling and set netting in FLA 2 is considered low and is largely managed under trawl and set net restrictions outlined in the Hector's and Māui dolphin Threat Management Plan (TMP).

Seabirds

319. Management of seabird interactions with New Zealand's commercial fisheries is guided by the National Plan of Action – Seabirds 2020 (NPOA-Seabirds). The NPOA-Seabirds reflects New Zealand's obligations under international law to take into account the effects of fishing on associated species such as seabirds. 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 to the extent practicable.

320. The proposed changes to the TAC and TACC for flatfish are unlikely to result in any increase to seabird interactions with vessels in the FLA 2 fishery. In the last five fishing years (to the end of September 2020) there have been no observed captures of seabirds, and no reported captures. Reporting of captures in FLA 2 involves high uncertainty due to limited observer coverage. However, best available information indicates an average estimated catch of four to eight seabirds per annum[18].

321. The inshore trawl fishery is responsible for a substantial portion of risk to some at risk seabird species. However, the true contribution of inshore trawl to the overall risk is highly uncertain because of cryptic mortality. The inshore trawl and set-net fisheries in FMA 2 do not attribute any disproportionate levels of risk to seabird species relative to fisheries in other areas.

Fish bycatch

322. Flatfish are taken by non-selective fishing methods such as set net and bottom trawl. This is of particular importance for East Coast tarakihi, as it is currently undergoing a rebuild due to low abundance and is taken as bycatch in FLA 2. Tarakihi has a wide depth profile and is caught in combination with several other species, including FLA 2. Decreasing the TACC for FLA 2 may restrict fishers from entering shallower waters to avoid traditional tarakihi habitat, thereby potentially increasing bycatch of tarakihi in TAR 2.

323. While this is a relevant consideration, Fisheries New Zealand's view is that this does not prevent sustainability measures being put in place to ensure the sustainability of the FLA 2 fishery. Fisheries New Zealand continues to actively monitor the East Coast tarakihi fishery to ensure actions to support the rebuild are being delivered upon.

Benthic impacts

324. Trawling can directly impact on biological diversity of the benthic environment. However, the proposed changes are not likely to significantly increase trawl effort. Bottom trawling in this fishery is also typically confined to areas that have been consistently fished over time (rather than areas of relatively undisturbed biodiversity).

[18] Captures of all birds in the flatfish trawl fisheries, in the FMA2 Central (East) and FMA8 Central (Egmont) areas, during the 2017-18 fishing year

325. Research has characterised both New Zealand's benthic environment and the level of benthic impact from fisheries activity (Aquatic Environment and Biodiversity Annual Review 2019/2020). The environmental impacts of fishing are summarised annually by Fisheries New Zealand and we will continue to monitor the bottom trawl footprint of fisheries.

Habitats of significance

326. Habitats of particular significance for fisheries management have not been identified in the area covering the FLA 2 fishery. With respect to FLA 2, river mouths and estuarine environments including shallow mudflats and sandflats are generally considered important nursery grounds for some species of juvenile flatfish.

4.2 Sustainability measures (section 11 of the Act)

327. Section 11 of the Act sets out various matters that you must take into account or have regard to when setting or varying any sustainability measures (such as a TAC). These include any effects of fishing on the stock and the aquatic environment, the natural variability of the stock concerned, and any relevant fisheries plans.

National Inshore Finfish Fisheries Plan

328. The National Inshore Finfish Fisheries Plan (the Plan), currently being finalised, provides guidance on management objectives and strategies for finfish stocks such as FLA 2. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.

329. Stocks are grouped within the Plan, with management approaches and objectives tailored accordingly for each group.

330. Flatfish fall under Group 2, which recognises that Fisheries New Zealand intend to manage these stocks to provide for moderate levels of use with moderate levels of information to monitor its stock status (e.g. a partial quantitative assessment compared against trends over time). To highlight this, Section 1.2 discusses trends within the CPUE data and how this information has been used to help inform the proposed options.

Regional Plans

331. There are five Regional Councils that have coastline within the FLA 2 boundaries. Each of these regions has multiple plans[19] to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems and habitats.

332. Fisheries New Zealand considers that the proposed 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.

[19] The five relevant regional councils have plans that include: Gisborne Region Tairāwhiti Resource Management Plan, Gisborne Regional Freshwater Plan, Hawke's Bay Regional Coastal Environment Plan, Hawke's Bay Marine and Coastal Group Roadmap Wellington Region Coastal Plan, Wellington Region Freshwater Plan, Horizons (Manawatū-Whanganui Region) One Plan, Taranaki Region Coastal Plan, Taranaki Region Freshwater Plan and New Zealand Government National Policy Statement for Freshwater Management 2020.

5 Submissions

333. Ten submissions were received on the FLA 2 proposal. Table 3 below provides a summary of submitters and indicates the option preferences of each submitter.

334. In general submitters supported the setting of a TAC for FLA 2 and a reduction to the TACC, with mixed support for Options 2 and 3 as well as a proposal for an alternative option which has been included as Option 4. Several submissions also identified habitat degradation, including urban and rural runoff in estuarine and river mouth ecosystems, as a major concern to this fishery.

Table 3: Written submissions and responses received for FLA 2 (in alphabetical order)

Submitter	Option Support				
	1	2	3	Other	
D. Mladek				✓	Supports a decrease but does not commit to any particular option.
Environment and Conservation Organisations NZ (ECO)				✓	Generally supports a decrease in catch, also proposed splitting FLA into separate species.
Fisheries Inshore New Zealand Ltd (FINZ)				✓	Did not provide support for any option, noted environmental concerns.
Iwi Collective Partnership (ICP)				✓	Supports Te Ohu Kaimoana's alternative option.
Joint submission: LegaSea, NZ Sports Fishing Council (NZSFC) and NZ Angling and Casting Association (NZACA)		✓			
M. Currie			✓		
NZ Recreational Fishing Council (NZRFC)			✓		
Forest and Bird NZ			✓		
Te Arawa Fisheries				✓	Supports Te Ohu Kaimoana's alternative option.
Te Ohu Kaimoana				✓	Proposed Option 4.

6 Options and analysis

335. Given that only a TACC is set for FLA 2 at present, we are not proposing the status quo as an option. For stocks which do not already have a TAC or allowances set, it is Fisheries New Zealand's policy to set these upon review of a stock.

6.1 Option 1

TAC: 782	**TACC:** 726	**Customary**: 10	**Recreational**: 10	**Other mortality**: 36

336. Option 1 proposes to set a TAC for FLA 2 at 782 tonnes. This includes setting allowances for customary, recreational, and other sources of mortality caused by fishing, while also retaining the current TACC at 726 tonnes.

337. The allowance for customary fishing is proposed to be set at 10 tonnes. Recognising that customary catch data for FLA 2 is incomplete, 10 tonnes is considered likely to provide for current and aspirational use by customary fishers. This level of allowance was discussed at relevant iwi forums and submissions did not raise concerns.

338. For recreational fishers, an allowance of 10 tonnes is also proposed. This is consistent with estimates from the most recent National Panel Survey which has estimated recreational catch of FLA 2 to be 9.1 tonnes.

339. Information to set the allowance for other sources of mortality caused by fishing is limited. The previous Minister had a preference that this be set at 10% of TACC for inshore stocks that are

predominantly taken by trawl, whereas analysis of other flatfish stocks were a TAC has been set, shows either no allowance or an allowance equal to two percent of TACC. This option recommends an intermediary approach, setting the allowance equivalent to five percent of the TACC. For this option this equates to an allowance of 36 tonnes.

340. Option 1 proposes retaining the TACC at 726 tonnes. This option places the greatest weight utilisation by retaining the TACC at elevated levels. It also reflects the approach that was taken when FLA 2 was introduced to the QMS by retaining a high TACC to provide for increased catch during periods of high abundance.

341. When setting a TAC, the requirement is to set it at a level that maintains the stock at or above a level that can produce the *MSY*, or enables the level of any stock whose current level is below that which can produce *MSY* to be altered appropriately to ensure the stock is restored to or above a level that can produce *MSY*.

342. Based on best available information, it is unknown whether a TAC at or greater than the current TACC will cause overfishing to occur or the stock to decline to unsustainable levels. If the TACC was to be fully utilised, it is unknown whether this would meet the objective of maintaining the stock at or above the target and hence result in a sustainability risk to FLA 2.

343. Additionally, Fisheries New Zealand is concerned that any increased catch at current levels of biomass would lead to added fishing pressure on other QMS species (e.g. gurnard, tarakihi, snapper and trevally), where greater levels of bycatch of these species could impact sustainability.

344. Fisheries New Zealand considers that this option poses the greatest risk by not addressing the potential sustainability risk associated with the current TACC nor does it address submitter concerns about the impacts of environmental degradation on FLA 2 productivity.

345. No submissions were received in support of this option.

6.2 Option 2

TAC: 230	**TACC:** 200 ↓ (526 t)	**Customary**: 10	**Recreational**: 10	**Other mortality**: 10

346. Option 2 proposes to set a TAC of 230 tonnes and includes allowances for customary and recreational fishing that are consistent with those proposed for Option 1. The proposed 10 tonne allowance for other mortality caused by fishing applies the same approach for all options (equal to 5% of the TACC). Under this option the TACC is proposed to be decreased to 200 tonnes, a level consistent with the average commercial catch reported over the last 10 years[20] (203 tonnes).

347. Reducing the TACC to 200 tonnes recognises that annual catch has been below the TACC since introduction to the QMS and the assessment within the Plenary which indicates that it is unknown whether the current TACC is sustainable. This option also recognises that FLA 2 is currently fluctuating around the B_{MSY} compatible target proxy that has been established for the stock and is expected to continue to fluctuate without trend under current catch levels.

348. Setting the TACC at the average for the last 10 years allows for a moderate increase in commercial utilisation comparative to recent years, but manages the risk of any sharp increases in commercial catch.

349. This option was supported by the joint NZSFC, Legasea and NZACA submission who support realistic catch limits to allow for sustainable use and abundant fisheries. The Joint submitters specifically noted the importance of a conservative approach to setting allowances, highlighting;

- the catch decline in the main target fishery
- CPUE data in the analysis comes from a relatively small portion (Hawke's Bay) of the total FLA 2 area.

[20] The ten-year average is calculated for the fishing years 2009/10 to 2018/19. The most recent fishing year has been excluded from the analysis due to the potential effects of COVID-19 on commercial catch during 2019/20.

6.3 Option 3

TAC: 163	**TACC:** 136 ↓ (590 t)	**Customary**: 10	**Recreational**: 10	**Other mortality**: 7

350. Option 3 proposes to set a TAC of 163 tonnes and includes allowances for customary and recreational catch that are consistent with those proposed for Option 1. The proposed seven tonne allowance for other mortality caused by fishing applies the same approach for all options (equal to 5% of the TACC).

351. Option 3 proposes to decrease the TACC from 726 tonnes to 136 tonnes. This is the level of catch that is consistent with the 2016-17 fishing year from which the 2018 CPUE update assessed the stock as currently fluctuating around the B_{MSY} compatible target proxy that has been established for the stock and is expected to continue to fluctuate without trend under current catch levels.

352. Reducing the TACC to 136 tonnes recognises that annual catch has been below the TACC since introduction to the QMS and the assessment within the Plenary which indicates that it is unknown whether the current TACC is sustainable. The TACC proposed for Option 3 is likely to constrain future catch either to or near current catch levels and therefore limits increased utilisation of the fishery. This option represents a cautious approach based on the 2016-17 CPUE dropping below the target and aims to increase abundance, despite fishing intensity declining over recent years.

353. This option was specifically opposed by both FINZ and NZSFC, both of whom emphasised that this option does not allow for fluctuations in stock abundance with flatfish known to be highly variable. FINZ also raised concerns relating to the CPUE, noting that the 2016-17 CPUE data point is but one in an entire time series and does not accurately reflect the trend over numerous years. FINZ also highlighted concerns relating to management priorities, suggesting that environmental and land-based effects should be addressed before cutting TACC.

354. This option is aimed to discourage further growth and exploitation in the fishery and takes a cautious approach to management, with no allowance for variability in recruitment and abundance.

355. Those submitters who supported Option 3 stressed the importance of flatfish to the recreational sector and highlighted concerns around the non-selective nature of trawling and the impacts this has on the marine environment. There is an emphasis on the need for conservation and biodiversity sustainability throughout these submissions.

356. This option was supported by Forest and Bird NZ, the New Zealand Recreational Fishing Council (NZRFC) and by individual submitter M. Currie;

- The NZRFC identified the lack of information about this species as a concern and suggested taking a precautionary approach to management of flatfish due to this lack of information.
- Forest and Bird NZ supported a precautionary approach noting the inability of the industry to catch the current TACC, the “non-selective and destructive” bottom trawl and set net fishing methods used, and the recent decline in CPUE. Forest and Bird NZ also expressed concern relating to a lack of observer coverage in the FLA 2 fleet.
- M. Currie supported decreases in all stocks, highlighting the interests of wildlife conservation and biodiversity sustainability.

6.4 Option 4 - Preferred

TAC: 178	**TACC:** 150 ↓ (576 t)	**Customary**: 10	**Recreational**: 10	**Other mortality**: 8

357. Option 4 is a new option that was introduced following consultation and was proposed by Te Ohu Kaimoana.

358. Option 4 proposes a TAC of 178 tonnes be set, including allowances for customary and recreational catch that are consistent with those proposed for Option 1. An eight tonne allowance for other mortality caused by fishing applies the same approach for all options (equating to 5% of the TACC). Option 4 proposes to decrease the TACC from 726 tonnes to 150 tonnes, consistent with the average catch reported over the last five years[21].

359. Reducing the TACC to 150 tonnes recognises that annual catch has been below the TACC since introduction to the QMS and the assessment within the Plenary which indicates that it is unknown whether the current TACC is sustainable. This option also recognises that FLA 2 is currently fluctuating around the B_{MSY} compatible target proxy that has been established for the stock and is expected to continue to fluctuate without trend under current catch levels.

360. This option allows for moderate utilisation of the stock whilst providing some headroom to recognise the natural variability and fluctuations within the fishery. This option allows for modest commercial activity to continue, while limiting the potential for the stock to become unsustainable.

361. Te Ohu Kaimoana proposed this option, commenting that current fishing pressure does not seem to affect abundance and the decrease in landings is likely attributed to a change in fishing dynamics and a general reduction in capacity in the inshore fleet. It suggests there is an opportunity to reduce the TACC to a level that better aligns with catch, while allowing some headroom to recognise the highly variable nature of the fishery. This option was also supported by Te Arawa Fisheries and the Iwi Collective Partnership (ICP).

6.5 Economic considerations

362. The economic impacts associated with the proposed options are likely minimal as the TACC has, historically, not been fully utilised. Fisheries New Zealand acknowledges that the current TACC allows for the opportunity of further utilisation and economic growth, and this may be important to some fishers who are considering changing fishing behaviour, such as to offset losses caused by the Hector's and Māui dolphin Threat Management Plan (TMP) decisions.

363. Provided recent catch trends continue, however, all options will provide for existing levels of utilisation. It is therefore unlikely that fishers would need to adjust their fishing behaviour in response to these proposed changes.

6.6 Other options proposed by submitters

Alternative recreational allowance

364. While the NZRFC supported Option 3, it expressed a concern that the recreational catch estimates had a level of uncertainty and likely underestimated catch from this sector. The NZRFC in turn, supported a recreational allowance of 15 tonnes.

365. An individual submitter, M. Currie, also supported Option 3, but suggested to decrease all recreational allowances.

Splitting the QMA

366. The joint NZSFC, LegaSea and NZACA submission proposed splitting the QMA into separate management areas based on the separate fisheries. They also proposed that the fishery is

[21] The five-year average is calculated for the fishing years 2014/15 to 2018/19. The most recent fishing year has been excluded from the analysis due to the potential effects of COVID-19 on commercial catch during 2019/20.

reviewed, and new areas are set based on management with revised commercial catch, CPUE and recreational harvest estimates in three years' time. The joint submitters also noted that the data used in the CPUE analysis comes from a small area in Hawke's Bay and is not representative of the entire QMA.

367. Under section 25 of the Act changes to QMAs are possible under two scenarios – either if you (the Minister) believe it necessary to ensure sustainability, or if quota owners agree to it.

368. Our preferred approach would be amending QMAs through section 25A, which requires a subdivision request from at least 75% of relevant quota owners. Fisheries New Zealand would expect to see considerable input and participation of Treaty partners, quota owners and stakeholders before this scenario was to become a priority.

Splitting the Species

369. ECO proposed splitting the management of flatfish into individual species. This is partially supported by joint recreational submitters who state that specific measures need to be taken to protect the viability of the black flounder population in Hawke's Bay.

370. Fisheries New Zealand has recently closed consultation on a proposal to require the reporting of flatfish species individually. Data from individual species reporting will drive future work to determine whether there is merit in splitting flatfish into separate quota stocks.

Habitat and environmental concerns

371. Forest and Bird NZ, ICP, FINZ and Te Ohu Kaimoana highlight habitat degradation and environmental effects being of major concern for flatfish, with estuarine and river mouth ecosystems being heavily influenced by these stressors.

372. Forest and Bird NZ specifically highlighted the impacts of bottom trawling on the seafloor, Forest and Bird NZ suggest that bottom trawling be phased out, noting that recovery from damage is slow and mitigating the impacts to the seafloor is not achievable.

373. Forest and Bird NZ also expressed concern relating to set-netting, highlighting the relatively non-selective nature of set nets and the threats these pose to threatened, endangered and protected species.

374. FINZ has stated that recent studies indicate that even historical sedimentation / runoff can continue to impact productivity of inshore areas years later. The ongoing effects of sedimentation creates an urgency for management action.

375. FINZ suggests that Fisheries New Zealand should advocate for this stock and put into place a research and management programme to address habitat degradation in line with local councils. FINZ also suggested that Fisheries New Zealand should be researching and implementing habitats of particular significance to promote action from regional councils.

376. Fisheries New Zealand acknowledges these concerns and refers to paragraphs 315-316 which discuss Fisheries New Zealand's role in this regard and the work we have underway.

6.7 Deemed values

377. Deemed values are the financial penalty paid by fishers for each kilogram of unprocessed fish landed in excess of a fisher's ACE holdings. The current deemed value rates of FLA 2 are shown below in Table 4.

Table 4: Current deemed value rates ($/kg) for FLA 2

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	200%+
FLA 2	1.2200	1.3600	1.6320	1.9040	2.1760	2.4480	2.7200

378. According to data from 2020/21, the current deemed value rates of FLA 2 currently fall between the average ACE price ($0.33/kg) and port price ($4.14/kg).

379. As the current deemed value rates of FLA 2 are set above the average ACE price and below the port price, Fisheries New Zealand considers the current deemed values to be sufficient for incentivising fishers not to catch in excess of their individual entitlement.

380. Te Ohu Kaimoana submitted that while the current settings are appropriate, a decrease in the TACC may lead to an increase in ACE price. If so, the deemed value may be too close to the ACE price, and a review may be necessary.

381. Fisheries New Zealand acknowledges that if the TACC is reduced, subsequent changes in fishing behaviour and the ACE market may result in the need for the deemed value to be re-evaluated in the future.

7 Conclusions and recommendations

382. Fisheries New Zealand recommends that you set a TAC and decrease the TACC for FLA 2, with our preferred option being Option 4. We also recognise that Option 4 was proposed and supported by iwi and Māori representatives.

383. Best available information indicates that FLA 2 has fluctuated around the management target under current catch levels, indicating that the stock is currently performing at a sustainable level. Notwithstanding this, we do recognise the concerns raised by submitters relating to environmental degradation and that these may be having an impact on the stock.

384. Given that the TACC is set much higher than current catch levels, there is uncertainty as to whether catch at the level of the TACC would be sustainable. We therefore consider it appropriate to reduce the TACC to be closer aligned with recent catch trends.

385. The TACC option favoured by Fisheries New Zealand is Option 4, which is based on a five-year average (excluding 2019/20 data) of commercial catch. We consider that this option addresses the potential sustainability risk associated with the current TACC and allows for commercial access to the fishery consistent with recent activity, while noting the natural variability of flatfish stocks.

386. In setting the other allowances for recreational, customary and other mortality, Fisheries New Zealand considers that values proposed through Option 4 (and consistent with other options) reflect best estimates while recognising the uncertainties associated with these estimates.

8 Decision for FLA 2

Option 1

Agree to set the FLA 2 TAC at 782 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 10 tonnes;
ii. Set the allowance for recreational fishing interests at 10 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 36 tonnes;
iv. Retain the FLA 2 TACC at 726 tonnes.

~~Agreed~~ / ~~Agreed as Amended~~ / Not Agreed

OR

Option 2

Agree to set the FLA 2 TAC at 230 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 10 tonnes;
ii. Set the allowance for recreational fishing interests at 10 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 10 tonnes;
iv. Decrease the FLA 2 TACC from 726 to 200 tonnes.

~~Agreed~~ / ~~Agreed as Amended~~ / Not Agreed

OR

Option 3

Agree to set the FLA 2 TAC at 163 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 10 tonnes;
ii. Set the allowance for recreational fishing interests at 10 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 7 tonnes;
iv. Decrease the FLA 2 TACC from 726 to 136 tonnes.

~~Agreed~~ / ~~Agreed as Amended~~ / Not Agreed

OR

Option 4 *(Fisheries New Zealand preferred option)*

Agree to set the FLA 2 TAC at 178 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 10 tonnes;
ii. Set the allowance for recreational fishing interests at 10 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 8 tonnes;
iv. Decrease the FLA 2 TACC from 726 to 150 tonnes.

Agreed / ~~Agreed as Amended~~ / ~~Not Agreed~~

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Dark Ghost Shark (GSH 1) – East Coast of Northland and Auckland, Bay of Plenty

Hydrolagus novaezealandiae, ghost shark

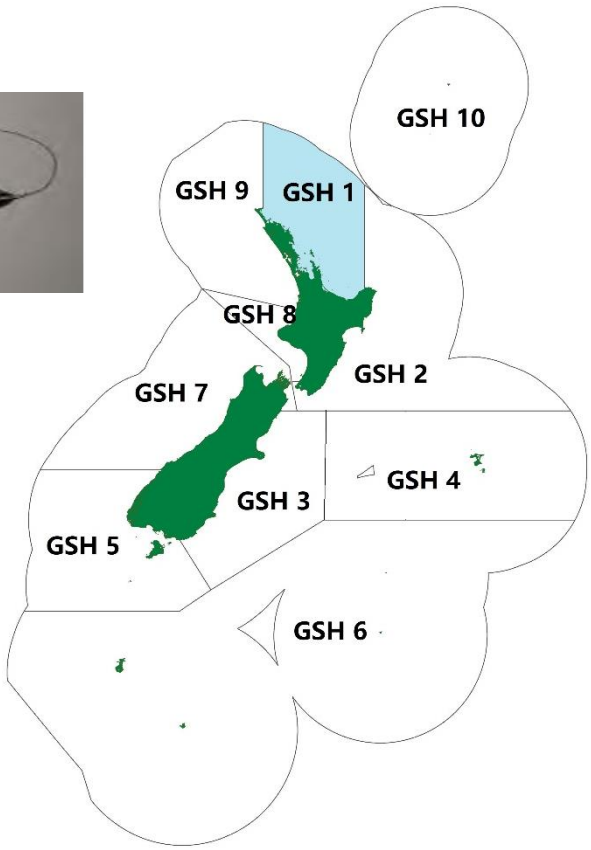

Figure 1: Quota Management Areas (QMAs) for dark ghost shark (GSH), with GSH 1 highlighted in blue. A dark ghost shark is pictured on the left.

Table 1: Summary of options proposed for GSH 1 from 1 October 2021. Figures are all in tonnes. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings	-	22	-	-	-
Option 1 *(Set TAC & allowances)*	26	22	1	1	2
Option 2	35	30 ↑ (8 t)	1	1	3
New option incorporated following consultation		No			
Total submissions received		10			
Number of submissions received in support of each option		Option 1		3	
		Option 2		6	
		Other		1	

1 Why are we proposing a review?

387. Dark ghost shark in GSH 1 is mainly caught as commercial bycatch in bottom trawl fisheries. There has been an increasing trend in commercial landings, and in the 2018/19 and 2019/20 fishing years, landings have exceeded the TACC. This increasing trend in catch suggests that there may be an opportunity to provide for increased utilisation.

388. In addition, no TAC or allowances for recreational fishing, customary Māori fishing, and other mortality caused by fishing have been set.

1.1 About the stock

1.1.1 Fishery characteristics

389. Dark ghost shark in GSH 1 is caught as bycatch in commercial bottom trawl fisheries (including precision seafood harvesting gear), mainly while targeting tarakihi. Dark ghost shark is also caught as bycatch in the hoki, gemfish, ling, scampi, and ruby fish target fisheries throughout FMA 1.

1.1.2 Biology

390. Dark ghost sharks occur through much of the New Zealand exclusive economic zone in depths from 30 to 850 m, but they are generally sparse north of 40° S (around Hawkes Bay).

391. Little is known about the biology of dark ghost sharks (*Hydrolagus novaezealandiae*). They are elasmobranchs of the family Chimaeridae (short nose chimaeras) and stomach contents indicate that they are predominantly benthic feeders. Elasmobranchs are believed to have a strong stock-recruit relationship; the number of young born is related directly to the number of adult females. Like other elasmobranchs, ghost shark fecundity is likely to be relatively low, making them more likely to be vulnerable to fishing pressure.

392. No published information is available on the age or growth rate of any *Hydrolagus* species; however, length-frequency histograms indicate that females grow to a larger size than males. On the Chatham Rise, the estimated size at 50% sexual maturity for dark ghost sharks is 52– 53 cm for males and 62–63 cm for females.

393. There is limited information on biological stock boundaries. There is an apparent difference in the maximum size of dark ghost sharks on the Chatham Rise, with both males and females attaining a maximum size 3–4 cm greater than those in Southland/sub-Antarctic waters.

1.2 Status of the stock

394. There is uncertainty on the status of the stock as there is no current information on the biomass that can support the maximum sustainable yield (B_{MSY}) or recent biomass estimates for GSH 1.

395. The best available information about the state of GSH 1 is from trends in landed catch. Fisheries New Zealand recognises the limitations in using catch landings as an indicator of stock status, given the variety of factors that can influence catch levels.

396. In the absence of a defined management target and limits, Fisheries New Zealand relies on the Draft National Inshore Finfish Plan approach of monitoring low information stocks against trends in catch over time to ensure sustainability.

2 Catch information and current settings within the TAC

2.1 Commercial

397. Commercial catch reporting provides catch levels for GSH 1, which is the best available information to indicate stock status. Landings of GSH 1 generally declined between 2006/07 to 2011/12 before steadily increasing from 2012/13 to 2019/20. In 2018/19 and 2019/20, commercial landings have exceeded the TACC (Figure 2). Landings have increased in recent years without evidence to suggest fishers have changed behaviour or begun to target GSH 1.

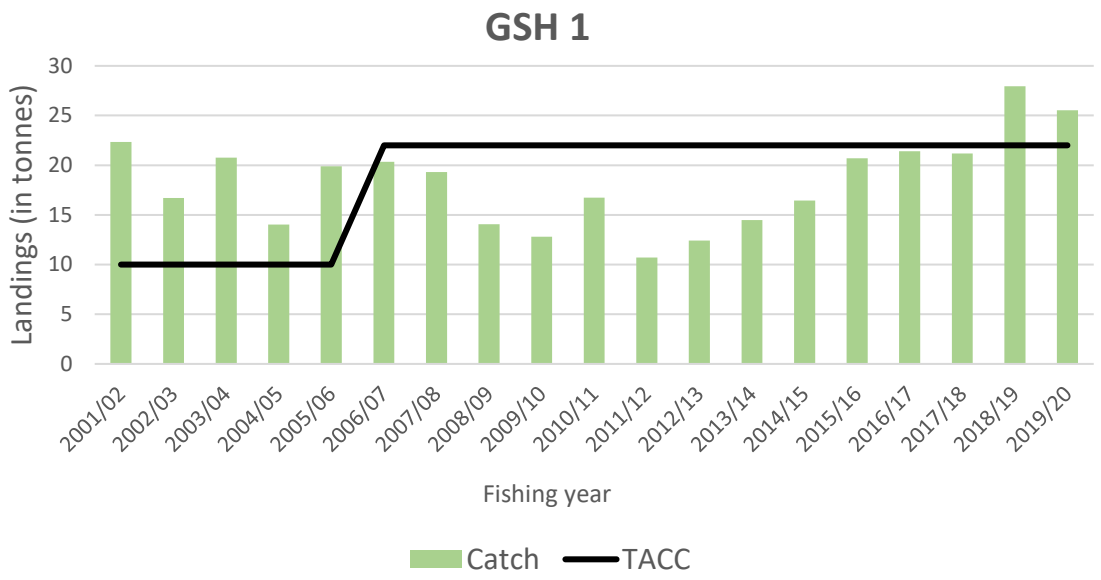

Figure 2. Annual commercial GSH 1 landings from 2001/02 to 2019/20.

2.2 Customary Māori

398. Customary Māori non-commercial catch of GSH 1 is unknown. While it is possible that there may be a small amount of customary take of GSH 1, Fisheries New Zealand has no record of any customary authorisations being issued, either under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 or the customary provisions available under the Fisheries (Amateur Fishing) Regulations 2013. It is possible that dark ghost sharks harvested for customary purposes are being taken under recreational fishing rules, as there are no size or daily bag limits that would necessitate a permit to be issued, however this is considered unlikely.

399. As there is no allowance for Customary Māori, the current settings do not reflect the possibility that there may be some customary take occurring, nor provide for the potential that customary take may occur in the future, particularly if the authorised customary take were to be harvested using commercial vessels.

400. There are five mātaitai reserves within GSH 1, where commercial fishing is not permitted. There are also two taiāpure, and four temporary closures implemented under section 186A of the Act (Table 2).

Table 2. Customary fisheries management areas in GSH 1.

Area	Management Type
Maketu Taiāpure	
Waikare Inlet Taiāpure	Taiāpure
Te Mata and Waipatukahu – shellfish	
Umupuia Beach – shellfish	
Marsden Bank and Mair Bank – shellfish	S186A Temporary Closure
Maunganui Bay – all fish species except kina	
Te Kopa o Rongokānapa Mātaitai	
Raukokere Mātaitai	
Te Rae o Kohi Mātaitai	
Te Maunga o Mauao Mātaitai	Mātaitai Reserve
Te Puna Mātaitai	

2.3 Recreational

401. GSH 1 is likely of low recreational interest due to the depth distribution of this species. Fisheries New Zealand does not have any information on recreational catch estimates for GSH 1, and it is not known to be a desired or targeted recreational species.

402. As there is no allowance for recreational fishing, the current settings do not reflect the possibility that there may be some recreational take, albeit small.

2.4 All other mortality caused by fishing

403. Fisheries New Zealand has little information to quantify the level of mortality caused by fishing in GSH 1. Currently, there is no allowance for all other mortality caused by fishing, however, as it is predominantly caught by bottom trawl, a moderate level of other mortality is expected.

404. In 2018, the former Minister of Fisheries indicated a preference for Fisheries New Zealand to move toward standardising other mortality caused by fishing for inshore trawl caught fish stocks at an amount equal to around 10% of their respective TACCs, unless there is evidence to suggest otherwise. Both Options 1 and 2 propose to set an allowance for other mortality caused by fishing consistent with the previous Ministers' preference.

405. The potential sources of other mortality for dark ghost shark could include unreported commercial bycatch, mortality associated with injury from smaller dark ghost shark passing through trawl nets, mortality associated with predation of dark ghost shark in nets, and mortality associated with the accidental loss or damage from fishing gear.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

406. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Iwi Fisheries Forums can develop Iwi Fisheries Forum Plans that describe how the iwi in the Forum exercise 70aitiakitanga over the fisheries of importance to them, and their objectives for the management of their interests in fisheries. Particular regard should be given to 70aitiakitanga when making sustainability decisions.

407. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.

408. The GSH 1 management area covers the rohe moana of the Te Hiku o Te Ika, 'Mid-North', and Mai I ngā Kuri a Whārei ki Tihirau Iwi Fisheries Forums. Prior to public consultation, information on the proposed review of sustainability measures was provided to these forums for consideration. No specific feedback relating to GSH 1 was received from the Te Hiku o Te Ika (Far North) and the Mai i ngā Kuri a Whārei ki Tihirau (Bay of Plenty) Iwi Fisheries Forums prior to or during consultation from these forums. During discussion with the 'Mid-North' Iwi Fisheries Forum, the forum's previous position was reconfirmed; that at this stage, they do not support increases to any TACCs in their rohe moana.

3.2 Kaitiakitanga

409. Ghost shark has been identified as a taonga species by the Te Hiku o Te Ika and Mai i ngā Kuri a Whārei ki Tihirau forums in their Iwi Fisheries Forum Plans.

Table 3. Iwi Fisheries Forum Management Objectives relevant to GSH 1.

Iwi Fisheries Forum	Relevant Management Objectives contained in Iwi Fisheries Forum Plan
Te Hiku o Te Ika Fisheries Forum	Fish stocks are healthy and support the social, cultural and economic prosperity of Te Hiku iwi and hapu. To maximise iwi influence on all key environmental decisions that impact on fisheries.
Mai i ngā Kuri a Whārei ki Tihirau Fisheries Forum	Iwi are actively engaged with others to increase their fisheries potential within environmental limits. The fisheries environment is healthy and supports a sustainable fishery. Tino rangatiratanga is advanced to ensure that iwi driven goals are achieved.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

410. As dark ghost shark is mainly caught as bycatch, environmental interactions will be similar to those occurring in bottom trawl fisheries. This includes interactions with seabirds, impacts on the benthic environment, and other bycatch species.

411. The proposed options are not expected to significantly change the environmental impacts of fisheries which catch dark ghost sharks. Catch rates of dark ghost sharks are unlikely to be a limiting factor (choke species) in target bottom trawl fisheries due to the low commercial value of the species, and either of the options presented are unlikely to influence overall trawl effort.

412. The following environmental interactions are the most relevant to the GSH 1 fishery.

Marine Mammals

413. Trawling poses risks to native fur seals and a variety of dolphins which are present in GSH 1. The trawl nets used by vessels can result in captures and potentially fatalities due to drowning when caught. Incidental bycatch of common dolphin and New Zealand fur seals have been reported in tarakihi target fisheries, which catch the majority of dark ghost shark as a bycatch.

Seabirds

414. Management of seabird interactions with New Zealand's commercial fisheries occurs under the National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries (NPOA-Seabirds). The NPOA Seabirds reflects New Zealand's obligations under international law to take into account the effects of fishing on associated species of seabirds. The NPOA Seabirds has established 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 to the extent practicable.

415. In addition to the NPOA-Seabirds plan, Fisheries New Zealand regularly publishes updates of its Aquatic Environment and Biodiversity Annual Review. The most recent release (2019/20) included a fully updated seabird section which focuses on estimates of capture and risk assessments conducted for seabirds that breed in New Zealand waters.

416. Seabird interactions that occur in tarakihi fisheries include interactions with petrels, prions, shearwaters and albatrosses.

Fish bycatch

417. Dark ghost shark is predominantly taken as a bycatch species in other target fisheries (mainly tarakihi) so it is unlikely that the options proposed will increase fish bycatch.

418. Tarakihi catch is currently restrained by the Eastern Tarakihi Management Strategy and Rebuild Plan which lays out a 20-year rebuild plan for tarakihi on the east coast of the North and South Islands. The options proposed for GSH 1 is unlikely to increase effort in tarakihi fisheries, and therefore incidental bycatch, as it is constrained by the rebuild plan.

Benthic impacts

419. Target fisheries which also catch dark ghost shark can have an impact on benthic biodiversity, and sponges and corals can be caught in trawl nets. It is not expected that the proposed options would result in increased fishing intensity which would increase impacts on the benthic environment.

4.2 Sustainability measures (section 11 of the Act)

420. As the current status of the stock is unknown and no assessment of any stocks of dark ghost shark has been completed, there is uncertainty in whether the proposed options will have an impact on the sustainability of the stock. Given that dark ghost shark is taken primarily as bycatch, catch levels depend largely on activity in other target fisheries and it is not anticipated that any of the proposed options will result in a change in current fishing distribution or intensity.

421. The Draft National Inshore Finfish Fisheries Plan (the Plan), currently being finalised, provides guidance on management objectives and strategies for finfish stocks such as GSH 1. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.

422. GSH 1 falls into Group 3 stocks in the Plan, which recognises that it is subjected to less fishing pressure than some other stocks, and that less comprehensive information for management is available. The general approach is to minimise management costs by using catch trends as the key monitoring tool. GSH 1 landings in excess of the TACC are used as a trigger for further investigation and consideration of review.

423. Dark ghost sharks are also included in the National Plan of Action for the Conservation and Management of Sharks (NPOA Sharks). The purpose of the NPOA sharks is to maintain the biodiversity and long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.

424. Based on the best available information, Fisheries New Zealand anticipates that the options proposed in this paper are unlikely to significantly impact the sustainability of dark ghost shark. However, the lack of information available on the status of GSH 1 will require Fisheries New Zealand to continue monitoring GSH 1 landings.

425. Section 11(2)(c) of the Fisheries Act 1996 requires you to have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (HGMPA) when varying the TAC relating to stocks with boundaries intersecting with the Park. The HGMP sits within the GSH 1 management area. It is not anticipated that catch of GSH 1 within the HGMP would significantly change under any option proposed in this paper as it is not a targeted species.

5 Submissions

426. Ten submissions were received on the review of GSH 1. These submissions and their supported options are below in Table 4.

Table 4: Written submissions and responses received for GSH 1 (in alphabetical order)

Submitter	Option Support			
	1	2	Other	
A. Flavell-Johnson	✓			
D. Mladek	✓			Opposes increases across all stocks
Environment and Conservation Organisations of NZ (ECO)	✓			
Fisheries Inshore NZ (FINZ)		✓		
Iwi Collective Partnership (ICP)		✓		
M. Currie			✓	Opposes commercial fishing of stock
N. & P. Gwillim (Western Bay Fishing Ltd)		✓		
NZ Recreational Fishing Council		✓		Only supports Option 2 under the conditions of robust monitoring programme and B_{MSY} above 50%.
Te Arawa Fisheries		✓		
Te Ohu Kaimoana		✓		

6 Options and analysis

427. Given that only a TACC is set for GSH 1 at present, the status quo has not been proposed as an option. For stocks which do not already have a TAC or allowances set, it is recommended that these settings are addressed upon review.

6.1 Option 1

TAC: 26	**TACC:** 22	**Customary**: 1	**Recreational**: 1	**Other mortality**: 2

428. Option 1 proposes to set a TAC of 26 tonnes, allowances for customary Māori and recreational fishing each at one tonne, and all other mortality caused by fishing at two tonnes. Option 1 proposes to maintain the status quo TACC of 22 tonnes.

429. This option reflects a cautious approach due to the low level of information available on the status of the stock, and the potential vulnerability of dark ghost sharks to fishing pressure as an elasmobranch. As such, this option retains the current commercial catch limits. Although allowances are being introduced, this option is likely to maintain overall catch at status quo levels as it not expected to change fishing behaviour. It does not cover the current level of

landings nor provide for further utilisation opportunities if the current trend of increased commercial landings continues.

430. In setting allowances and a TAC, Option 1 accounts for all users of the fishery. Customary Māori and recreational allowances are proposed to be set at nominal amounts of one tonne as catch is likely to be negligible.

431. Under this proposal, all other mortality caused by fishing will be set at an amount that approximately equals 10% of the TACC, which is consistent with the former Ministers' decision in 2018.

432. Three submitters supported Option 1, each noting opposition to any catch increases due to low stock knowledge being a key concern.

6.2 Option 2 - Preferred

TAC: 35	**TACC:** 30 ↑ (8 t)	**Customary**: 1	**Recreational**: 1	**Other mortality**: 3

433. Option 2 proposes to set the TAC at 35 tonnes, allowances for customary Māori and recreational fishing each at one tonne, and all other mortality caused by fishing at three tonnes. Option 2 proposes an approximate 36% increase to the TACC from 22 to 30 tonnes.

434. Option 2 is a moderate approach to provide for utilisation and poses a higher level of risk than Option 1. It proposes to increase the TACC to approximately two tonnes above the highest landings in the 2018/19 fishing year to reflect the increasing trend in landings, which is the best available information on the status of GSH 1. Option 2 poses a higher level of risk as there is no current information on the B_{MSY} or recent biomass estimates for GSH 1. As fecundity of dark ghost shark is likely to be low, GSH 1 may be more vulnerable to fishing pressure. However, as the best available information does not suggest a sustainability concern, the increasing trend in GSH 1 catch has prompted consideration being given to utilisation.

435. Increasing the TACC may result in a very small increase in economic benefits to commercial fishers of around $4,240 (based on a port price at $0.53/kg for 2020/21). The proposed TACC increase would likely have the effect of allowing fishers to balance non-target GSH 1 landings through the additional ACE that would be available.

436. Customary Māori and recreational allowances are proposed to be set at nominal amounts, as catch is likely to be negligible.

437. Under this proposal, all other mortality caused by fishing will be set at an amount that equals 10% of the TACC, which is consistent with the former Ministers' decision in 2018.

438. Fisheries New Zealand would continue to monitor GSH 1 landings and review the TAC settings if required, consistent with the Draft National Inshore Finfish Fisheries Plan.

439. Six submitters supported Option 2. Many of these submitters considered that the sustainability risks under the proposed option were minimal and should not prevent increased utilisation. FINZ also expressed the view that uncertainties surrounding the stock should not allow for a lack of management.

6.3 Other options proposed by submitters

440. One submitter, M. Currie, did not support either of the options proposed. This submitter stated a preference to not have the TAC set and to have the TACC 'banned' due to concerns over the lack of basic biological data, the uncertain long-term sustainability of catch levels, the unknown status of the stock and the impact of bottom trawling on benthic species.

441. Fisheries New Zealand acknowledges that reliable estimates of *MSY* are not available for GSH 1 at this time. However, the proposed options are not inconsistent with the objective of

maintaining the stock at or above a level that can produce B_{MSY} (which is the requirement under section 13 2(A) of the Act).

6.4 Deemed values

442. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

443. GSH 1 deemed values are set at a standard differential rate (see Table 5 below).

Table 5: Current deemed value rates ($/kg) for GSH 1

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
GSH 1	0.32	0.35	0.42	0.49	0.56	0.63	0.70

444. Deemed value changes are not being considered for GSH 1 at this time as the current deemed values are set between the average ACE price ($0.16/kg) and average port price ($0.53/kg), providing an incentive for fishers to balance catch against ACE.

445. Te Ohu Kaimoana expressed support for a review of GSH 1 deemed value settings based on the 2019/20 port price presented in our GSH 1 consultation paper ($0.26/kg). However, the updated port price for 2020/21 ($0.53/kg) indicates that the deemed value settings are now consistent with the Deemed Value Guidelines.

7 Conclusions and recommendations

446. Section 13 of the Act requires you to set a TAC for GSH 1 that enables the stock to be maintained at, or move towards, a level at or above that which can produce the *MSY*. The best available information on GSH 1 is insufficient to enable reliable estimates of *MSY* or the biomass that will produce it. Where reliable estimates of *MSY* are not available, section 13(2A) provides that the Minister must use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above a level that can produce B_{MSY}.

447. The best information is commercial landings, and Fisheries New Zealand acknowledges that landings are not a good indicator of stock status. However, landings have increased without evidence of fishers targeting GSH 1 or altered fishing patterns. The increase in landings could therefore be suggestive of increasing abundance of GSH 1. Fisheries New Zealand therefore recommends Option 2 as it is considered not to be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

448. Fisheries New Zealand considers that Option 2 will not significantly increase the impacts on associated or dependent species, as the low value of dark ghost shark makes it unlikely to be an influential factor in changes to fishing patterns.

449. As it is a low value species, there will be little tangible change in benefits to customary and recreational fishers as current catch is thought to be small. There will be a small benefit to commercial fishers to provide for utilisation.

450. As an elasmobranch, dark ghost sharks may be more vulnerable to fishing pressure. Fisheries New Zealand acknowledges that this will require trends in landings to be monitored and consideration of opportunities to improve information gathering in the future. Further management action may be required if there is a change from the current trend, which may suggest a sustainability issue.

8 Decision for GSH 1

Option 1

Agree to set the GSH 1 TAC at 26 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 1 tonnes;
ii. Set the allowance for recreational fishing interests at 1 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing to 2 tonnes;
iv. Retain the current GSH 1 TACC at 22 tonnes.

~~Agreed / Agreed~~ as ~~Amended~~ / Not Agreed

OR

Option 2 (*Fisheries New Zealand preferred option)*

Agree to set the GSH 1 TAC at 35 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 1 tonnes;
ii. Set the allowance for recreational fishing interests at 1 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing to 3 tonnes;
iv. Increase the GSH 1 TACC from 22 to 30 tonnes.

Agreed / ~~Agreed as Amended / Not Agreed~~

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Giant stargazer – (STA 1) Waikato, East and West Coasts of Auckland and Northland, Bay of Plenty

Kathetostoma giganteum, Monkfish, *puwhara, moamoa, kourepoua*

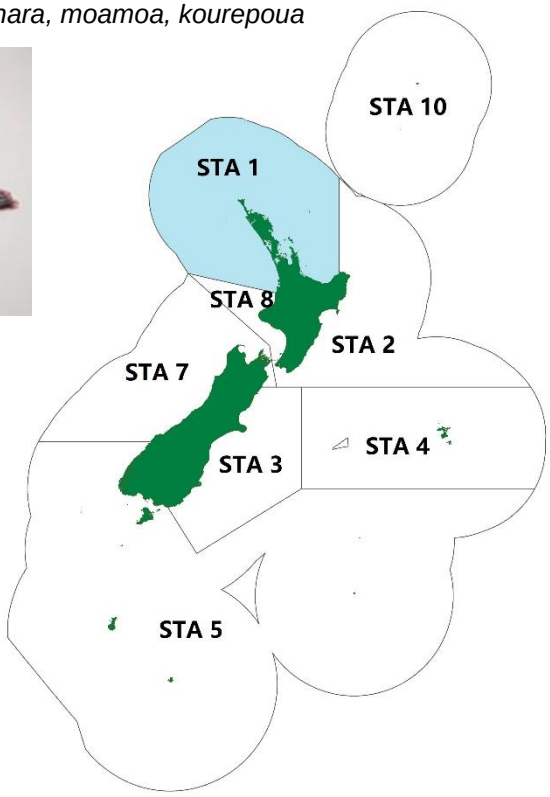

Figure 1: Quota Management Areas (QMAs) for giant stargazer (STA) with STA 1 highlighted in blue. A giant stargazer is pictured on the left.

Table 1: Summary of options proposed for STA 1 from 1 October 2021. Figures are all in tonnes. The option preferred by Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings *(status quo)*	-	21	-	-	-
Option 1 *(set a TAC and allowances)*	24	21	1	1	1
Option 2	29	25 ↑ (4 t)	1	1	2
Option 3	31	27 ↑ (6 t)	1	1	2

New option incorporated following consultation	No	
Total submissions received	10	
Number of submissions received in support of each option	Option 1	5
	Option 2	4
	Option 3	0
	Other	1

1 Why are we proposing a review?

451. The Total Allowable Commercial Catch (TACC), set at 21 tonnes, has been exceeded in each of the last three years, and this has initiated a review of STA 1. The trend of increasing commercial catch may indicate that there is an increase in abundance and therefore an opportunity to provide for increased utilisation; however, the status of the stock with respect to the biomass that can produce the maximum sustainable yield is unknown. Whether or not overfishing is occurring is also unknown.

452. Currently there are no allowances set for Māori customary fishing, recreational fishing, or other mortality caused by fishing, nor is a Total Allowable Catch (TAC) set for STA 1. Fisheries New Zealand's policy is to recommend to the Minister to set a TAC and allowances whenever a stock is reviewed.

1.1 About the stock

1.1.1 Fishery characteristics

453. STA 1 is predominantly caught using bottom trawl (including precision seafood harvesting gear) on inshore vessels as a bycatch species when targeting tarakihi, ling and more recently john dory. Giant stargazer has not been reported as a target species by fishers in STA 1 since 2005.

1.1.2 Biology

454. Giant stargazer (*Kathetostoma giganteum*) are found throughout the New Zealand exclusive economic zone on muddy and sandy substrates to depths of 500 m and are most plentiful around the South Island. Giant stargazer reach a maximum age of at least 25 years and become sexually mature around 5-7 years.

1.2 Status of the stock

455. There has been no stock assessment of STA 1 to determine the current biomass, maximum sustainable yield, or biomass that can support the maximum sustainable yield. The best available information about the state of STA 1 is from trends in catch from commercial reporting. This reporting includes catch estimates, fishing effort data and landing information.

2 Catch information and current settings within the TAC

2.1 Commercial

456. The catch history from 2001-2020 for STA 1 is illustrated in Figure 2 below. Catch has generally varied near to or above the TACC, declining well below the TACC in 2014 to 2016, and then increasing to have exceeded the TACC in the last three years.

457. It is unclear if the increase in landings is due to an increase in abundance or because of changes in fishing patterns. For example, vessels that use precision seafood harvesting gear in parts of FMAs 1 & 9 cannot fish waters shallower than 50 metres in depth and therefore may be fishing in deeper waters than in previous years to take advantage of using this new technology.

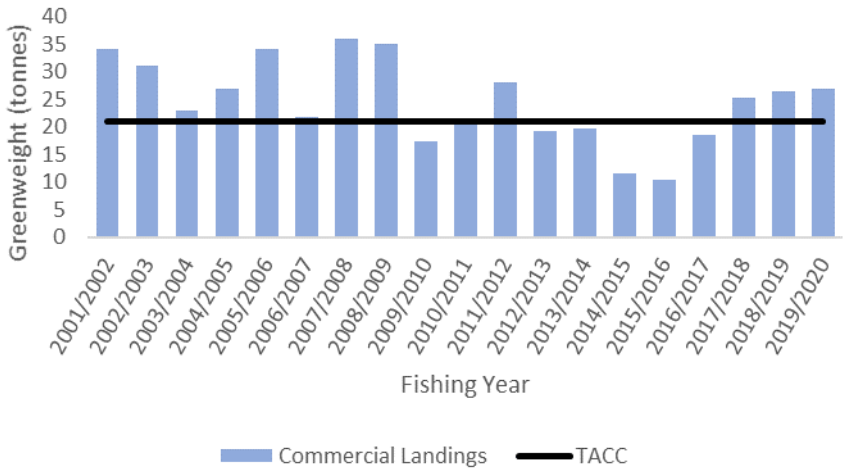

Figure 2: Commercial landings and TACC for STA 1 from 2001/2002 to 2019/2020.

2.2 Customary Māori

458. The amount of customary Māori non-commercial catch of STA 1 is unknown and Fisheries New Zealand has no record of any customary authorisations for giant stargazer. It is possible that giant stargazer harvested for customary purposes is being taken under the Fisheries (Amateur Fishing) Regulations 2013, and therefore has not been reported in the Māori customary harvest information available to Fisheries New Zealand.

459. Giant stargazer has been identified as a taonga species by the Te Hiku o Te Ika and Mai i Nga Kuri a Wharei ki Tihirau forums in their respective Iwi Fisheries Forum Plans.

460. There are a number of customary fisheries management areas within STA 1. These include seven mātaitai reserves, three taiāpure and four temporary closures implemented under section 186A of the Act (Table 2).

Table 2. Customary fisheries management areas in STA 1

Area	Management Type
Maketu Taiāpure	Taiāpure
Waikare Inlet Taiāpure	
Kawhia Aotea Taiāpure	
Te Mata and Waipatukahu Temporary Closure - shellfish	S186A Temporary Closure
Umupuia Beach Temporary Closure - shellfish	
Marsden Bank and Mair Bank Temporary closure - shellfish	
Maunganui Bay – all fish species except kina	
Te Kopa o Rongokānapa Mātaitai	Mātaitai Reserve
Raukokere Mātaitai	
Te Rae o Kohi Mātaitai	
Te Maunga o Mauao Mātaitai	
Te Puna Mātaitai	
Aotea Harbour Mātaitai	
Marokopa Mātaitai	

2.3 Recreational

461. The best available information on recreational catch is from the National Panel Survey (NPS) of Marine Recreational Fishers in 2017–18 which estimated a very small number (156 fish) were caught in STA 1.

462. There is no size limit or maximum daily bag limit or recreational allowance set for giant stargazer in STA 1.

2.4 All other mortality caused by fishing

463. There is no allowance set for other sources of mortality caused by fishing for STA 1.

464. The main fishing method for STA 1 is bottom trawl, which can fish over considerable depths. There are likely to be other sources of fishing mortality beyond giant stargazer being caught and landed using this fishing method.

465. There is no information on the magnitude of any other STA 1 mortality caused by fishing. However, potential sources could include: unreported commercial bycatch, mortality associated with injury from trying to escape nets on the haul, mortality associated with catch and release during recreational fishing, mortality associated with predation when caught in nets and mortality associated with the accidental loss or damage of fishing gear.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

466. 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 interests in fisheries. Particular regard should be given to kaitiakitanga when making sustainability decisions.

467. Prior to public consultation, the review of STA 1 was discussed at the Mid-North Iwi Fisheries Forum. The Mid-North Forum has stated that they do not support any increases to TACCs within their rohe moana.

468. Information on the proposed review of sustainability measures was also provided to the Te Hiku o Te Ika (Far North), Nga Hapu o Te Uru o Tainui (Waikato/West Coast North Island) and the Mai i Nga Kuri a Wharei ki Tihirau (Bay of Plenty) Iwi Fisheries Forums ahead of the November 2020 forum hui.

3.2 Kaitiakitanga

469. Giant stargazer has been identified as a taonga species by the Te Hiku o Te Ika and Mai i Nga Kuri a Wharei ki Tihirau forums in their respective Iwi Fisheries Forum Plans.

470. The STA 1 QMA covers the rohe of the Te Hiku o Te Ika, Mid-North, Nga Hapu o Te Uru o Tainui, Hauraki Iwi Collective and Mai i Nga Kuri a Wharei ki Tihirau Iwi Fisheries Forums. Giant stargazer has been identified as a taonga species by the Te Hiku o Te Ika and Mai i Nga Kuri a Wharei ki Tihirau forums in their respective Iwi Fisheries Forum Plans.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

471. As stargazer is primarily caught as a bycatch species, it is expected that environmental interactions will be similar to those occurring in mixed species bottom trawl fisheries. The proposed options are not expected to significantly change the environmental impacts of fisheries which catch giant stargazer.

472. All environmental interactions within the giant stargazer fishery are important and mitigation considerations to these interactions should be made. The following are the most relevant in this particular fishery:

Marine Mammals

473. Trawling poses risks to fur seals and a variety of dolphins which are present in STA 1. The trawl nets used by vessels can result in captures and potential fatalities from drowning when caught. STA 1 overlaps with Māui dolphin habitats, which are recognised as threatened.

474. Fisheries-related risks to Hector's and Māui dolphins are managed under the Hector's and Maui Dolphin Threat Management Plan which took effect 1 October 2020 and includes extending the trawl fishing closure within Māui dolphin habitat in STA 1.

Fish bycatch

475. Giant stargazer is predominantly taken as a bycatch species in other targeted fisheries. Where giant stargazer is targeted, it is unlikely that there will be effects on interactions in fish bycatch should there be an increase in the TACC as proposed.

476. Tarakihi catch is currently constrained by the Eastern Tarakihi Management Strategy and Rebuild Plan which lays out a 20-year rebuild plan for tarakihi on the east coast of the North and South Islands. A setting of the TAC, a marginal increase of the TACC and the setting of allowances for STA 1 are unlikely to cause any changes in the tarakihi fisheries, given that they are already constrained by the rebuild plan.

Seabirds

477. Management of seabird interactions with New Zealand's commercial fisheries occurs under the National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries (NPOA-Seabirds). The NPOA Seabirds reflects New Zealand's obligations under international law to take into account the effects of fishing on associated species of seabirds. The NPOA Seabirds has established 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 to the extent practicable.

478. In addition to the NPOA-Seabirds plan, Fisheries New Zealand regularly publishes updates of its Aquatic Environment and Biodiversity Annual Review. The most recent publication (Fisheries New Zealand 2020) included a fully updated seabird section which focuses on estimates of capture and risk assessments conducted for seabirds that breed in New Zealand waters.

479. Seabird interactions occur in the fisheries that take giant stargazer as bycatch. Encounters are most common in the bottom long line and bottom trawl fisheries targeting snapper, with petrels, shearwaters, and albatrosses making up the majority of the seabird interactions. Black petrels and flesh-footed shearwaters are examples of threatened seabirds that interact with commercial fishing in STA 1. It is possible that an increase in TACC for STA 1 could lead to an increase in fishing effort in target fisheries that poses a risk to seabirds. Increased fishing effort will likely cause increased risk of seabird interactions within these fisheries, but the significance is uncertain.

Benthic impacts

480. It is not expected that the proposed options would result in increased targeting of giant stargazer and therefore impacts on the sandy/muddy habitat they typically occupy are not expected to change. While also not anticipated, if an increased STA 1 TACC facilitated an increase in other target fisheries, particularly those that seek out assemblages of fish around reef structures, there may be implications in terms of the effects of fishing on biological diversity and benthic habitats in these areas.

4.2 Sustainability measures (section 11 of the Act)

National Inshore Finfish Fisheries Plan

481. The National Inshore Finfish Fisheries Plan (the Plan), currently being finalised, provides guidance on management objectives and strategies for finfish stocks such as STA 1. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.

482. Stocks are grouped within the Finfish Plan, with management approaches and objectives tailored accordingly for each group. STA 1 falls into Group 3, which recognises that it is subject to less fishing pressure than some other stocks, and that less comprehensive information for management is available. The general approach is to minimise management costs by using catch trends as the key monitoring tool. STA 1 landings in excess of the TACC are used as a trigger for further investigation and consideration of review.

The Hauraki Gulf Marine Park Act 2000

483. Section 11(2)(c) of the Fisheries Act 1996 requires you to have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (HGMPA) when varying the TAC relating to stocks with boundaries intersecting with the Park.

484. The Hauraki Gulf Marine Park (HGMP) falls within the quota management area of STA 1, therefore sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 are applicable. Uncertain amounts of giant stargazer are taken from within the HGMP. It is not anticipated catch within the marine park would significantly change under any option proposed in this paper.

5 Submissions

485. Ten submissions were received in relation to STA 1. These submissions and their supported options are below in Table 3. Alternative options and suggestions are discussed under heading 6.3 below.

Table 3: Written submissions and responses received for STA 1 (in alphabetical order)

Submitter	Option Support				
	1	2	3	Other	
A. Flavell-Johnson	✓				
D. Mladek	✓				Opposes increases across all stocks
Environmental and Conservation Organisations NZ (ECO)	✓				
Fisheries Inshore NZ (FINZ)		✓			
Forest and Bird NZ	✓				
Iwi Collective Partnership		✓			
M. Currie				✓	Opposes commercial fishing of stock
NZ Recreational Fishing Council	✓			✓	Would support a different option if the recreational allowance is increased to 2 tonnes
Te Arawa Fisheries		✓			
Te Ohu Kaimoana		✓		✓	Supports Option 2 with a 1 tonne all other sources of mortality allowance.

6 Options and analysis

486. Given that only a TACC is set for STA 1 at present, we are not proposing the status quo as an option. For stocks which do not already have a TAC or allowances set, it is recommended these settings are addressed upon review.

6.1 Option 1

TAC: 24	**TACC:** 21	**Customary**: 1	**Recreational**: 1	**Other mortality**: 1

487. Option 1 proposes to set a TAC and allowances, but proposes no change to the current TACC setting. This option carries the least sustainability risk and places the most weight on the uncertainty of the status of the stock.

488. In 2019 the former Minister set the allowance for other sources of mortality caused by fishing in STA 7 (see Figure 1) at a level approximately equating to 5%, after acknowledging feedback during consultation that stargazer are robust compared with other inshore trawl caught stocks. Consistent with that decision, Option 1 proposes that the allowance for other sources of mortality caused by fishing in STA 1 be set at one tonne.

489. Five submissions were received in favour of Option 1. Forest and Bird NZ supported this option, expressing that there is need for a precautionary approach to minimise sustainability risks. Other submitters cited a lack of knowledge on the stock in their support for this option.

6.2 Option 2 - Preferred

TAC: 29	**TACC:** 25 ↑ (4 t)	**Customary**: 1	**Recreational**: 1	**Other mortality**: 2

490. Under Option 2 it is proposed to set a TAC and allowances and make a modest increase to the current TACC setting. This option carries a lower sustainability risk than Option 3, placing weight on the uncertainty regarding the status of the stock, whilst recognising an opportunity for utilisation of STA 1.

491. A conservative increase from 21 tonnes to 25 tonnes is proposed for the TACC under Option 2. In the last three years the landed catch has exceeded the TACC, with the average landed catch of these three years being 25 tonnes. Although the proposed change under Option 2 is conservative, it provides an opportunity for utilisation of STA 1.

492. The estimated economic value of the proposed TACC increase under Option 2, based on the 2019/20 port prices, suggests an additional $6,211 of economic benefit to the commercial sector. Port price is what the commercial fisher receives, not what the fish is worth at market (which is higher). Nor does it reflect the income for Licensed Fish Receivers and retailers.

493. Under this option, an allowance is proposed for other sources of mortality caused by fishing that is in accordance with the former Minister's 2019 decision for STA 7. The allowance is proposed to be set at two tonnes, just above 5% of the TACC.

494. Option 2 proposes to set a customary Māori allowance of one tonne as catch is likely to be low and there have been no reports of customary authorisations for giant stargazer in STA 1. Option 2 proposes to set the recreational allowance at one tonne based on the harvest estimates of 156 fish, which should be covered under this allowance with room for additional take should availability increase

495. Four submissions were in favour of Option 2. Te Ohu Kaimoana and FINZ both considered sustainability risks to be low for this option.

6.3 Option 3

TAC: 31	**TACC:** 27 ↑ (6 t)	**Customary**: 1	**Recreational**: 1	**Other mortality**: 2

496. Under Option 3 it is proposed to set a TAC, allowances and make an increase to the current TACC setting. This option carries the greatest sustainability risk out of the three options, as it proposes the highest increase to the TACC. The increase is proposed at the highest catch figure from the last five years.

497. The proposed six tonne increase to the TACC under Option 3 would take the TACC to 27 tonnes and is considered to be moderate. This option provides the greatest additional short-term utilisation opportunity by allowing for the highest recent catch. Further monitoring of STA 1 should identify future sustainability risks and indicate whether another review of the stock will be required.

498. The estimated economic value of the proposed TACC increase under Option 3, based on the 2019/20 port prices, suggests an additional $9,316 economic benefit to the commercial sector.

499. Option 3 proposes to set a customary Māori allowance at one tonne as catch is likely to be low and there have been no reports of customary authorisations for giant stargazer in STA 1. Option 3 proposes to set the recreational allowance at one tonne based on the harvest estimates of 156 fish, which should be covered under this allowance with room for additional take should availability increase.

500. Under this option, an allowance is proposed for other sources of mortality caused by fishing that is in accordance with the former Minister's 2019 decision for STA 7. The allowance is proposed to be set at two tonnes, just above 5% of the TACC.

501. No submissions received were in favour of Option 3.

6.4 Other options proposed by submitters

502. The submission from A. Flavell-Johnson supports the current settings remaining unchanged, with no allowances set. This view opposed any increased catch limit due to the lack of knowledge of the species stock.

503. M. Currie submitted that there be no TAC set, no allowances set and the TACC be banned or to keep the status quo. His submission includes a rationale based around concerns to wildlife and habitat destruction due to bottom trawling.

504. Fisheries New Zealand does not support either of the above options.

505. The New Zealand Recreational Fishing Council presented a different option than those proposed. Setting the TAC at 30 tonnes, increasing the TACC to 25 tonnes, setting the customary allowance at one tonne and the recreational and other sources of mortality allowances at two tonnes each. There was no rationale provided with this option. The submission included that if this new proposed option was not considered, then the submission was in favour of Option 1.

506. Te Ohu Kaimoana support the TAC and TACC changes presented in Option 2. It also supported the approach of using 5% of the TACC to guide setting of the allowance for other sources of mortality caused by fishing. The rationale for this other option is that, this will account for the robust physical characteristics of Giant stargazer. Which is in line with the 2019 Ministers comments on the STA 7 consultation feedback. It was suggested that a setting of one tonne for all options was more appropriate under this approach.

6.5 Deemed values

507. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

508. STA 1 deemed values are set at a standard differential rate (see Table 4 overleaf).

Table 4: Current deemed value rates ($/kg) for STA 1

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
STA 1	0.90	1.00	1.20	1.40	1.60	1.80	2.00

509. According to data from 2020/21, the current deemed value rates of STA 1 fall between the average ACE price ($0.44/kg) and port price ($2.04/kg).

510. As the current deemed value rates are set at, or slightly above the average ACE price, Fisheries New Zealand considers the current deemed values regime to be sufficient for incentivising fishers not to catch in excess of their individual annual catch entitlements.

511. In its submission Te Ohu Kaimoana noted that it supported retaining these deemed value settings.

7 Conclusions and recommendations

512. The best available information on STA 1 is insufficient to enable reliable estimates of *MSY* or the biomass that will produce it. Where reliable estimates of *MSY* are not available, section 13(2A) of the Act requires the Minister to use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the *MSY.*

513. The stock status of STA 1 is unknown and the biomass that can support *MSY* is also unknown. The best available information is based on commercial catch trends.

514. The STA 1 TACC has been exceeded for the last three years with the greatest catch being six tonnes over the TACC. The reason for the increase in catch is unknown, however it could indicate that abundance of giant stargazer in STA 1 has increased. In line with the approach for Group 3 stocks set out in the Finfish plan, this increase in catch has initiated a review and the setting of a TAC and other allowances.

515. Option 2 is the preferred option of Fisheries New Zealand. This option places weight on recent catch trends and provides a modest opportunity for increased utilisation. This option presents a slightly higher sustainability risk than Option 1, however, it is expected that this risk could be managed through ongoing monitoring of commercial catch, which has recently improved through the implementation of electronic reporting.

8 Decision for STA 1

Option 1

Agree to set the STA 1 TAC at 24 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 1 tonne;
ii. Set the allowance for recreational fishing interests at 1 tonne;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing to 1 tonne;
iv. Maintain the current setting of the STA 1 TACC of 21 tonnes.

Agreed / ~~Agreed as Amended / Not Agreed~~

OR

Option 2 *(Fisheries New Zealand Preferred option)*

Agree to set the STA 1 TAC at 29 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 1 tonne;
ii. Set the allowance for recreational fishing interests at 1 tonne;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing to 2 tonnes;
iv. Increase the STA 1 TACC from 21 to 25 tonnes.

~~Agreed / Agreed as Amended~~ / Not Agreed

OR

Option 3

Agree to set the STA 1 TAC at 31 tonnes and within the TAC:

i. Set the allowance for Māori customary non-commercial fishing interests at 1 tonne;
ii. Set the allowance for recreational fishing interests at 1 tonne;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing to 2 tonnes;
iv. Increase the STA 1 TACC from 21 to 27 tonnes.

~~Agreed / Agreed as Amended~~ / Not Agreed

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Yellow-eyed mullet (YEM 9) - Waikato, West Coast Auckland and Northland

Aldrichetta forsteri, herring, aua, kanae, kātaha

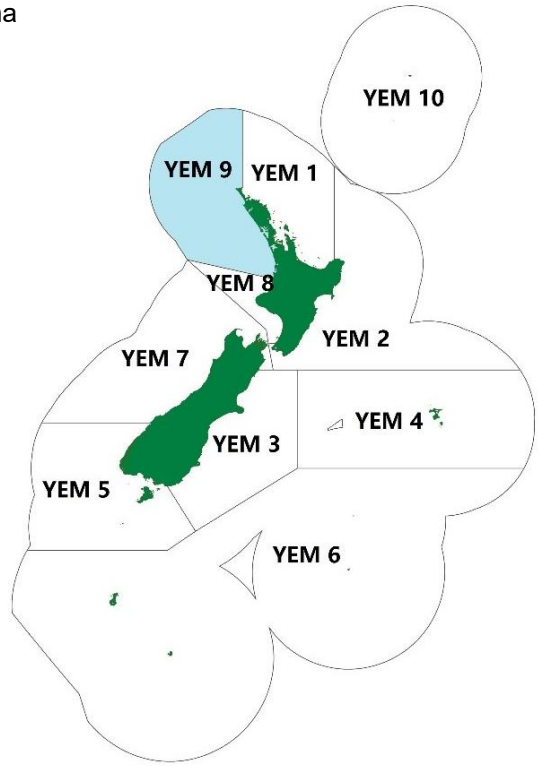

Figure 1: Quota Management Areas (QMAs) for yellow-eyed mullet (YEM), with YEM 9 highlighted. A yellow-eyed mullet is pictured on the left.

Table 1: Summary of options proposed for YEM 9 from 1 October 2021. Figures are all in tonnes. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings	38	30	4	4	-
Option 1 *(Set all other mortality)*	38	29 ↓ (1 t)	4	4	1
Option 2	26 ↓ (12 t)	17 ↓ (13 t)	4	4	1
Option 3	19 ↓ (19 t)	10 ↓ (20 t)	4	4	1
New option incorporated following consultation		No			
Total submissions received		14			
Number of submissions received in support of each option		Option 1		1	
		Option 2		0	
		Option 3		4	
		Other		9	

1 Why are we proposing a review?

516. The review of YEM 9 addresses a potential sustainability concern with the current management settings. This concern arises from a few factors: a consistent low level of catch in comparison to the TACC, known environmental degradation of some yellow-eyed mullet estuarine and harbour habitats, and the potential for localised depletion in the Manukau Harbour.

517. Further to this, Fisheries New Zealand recognises that yellow-eyed mullet is an important food source for marine mammals, seabirds, and predatory fishes, and that appropriate management settings for YEM 9 should consider the role of yellow-eyed mullet as an important prey species in its ecosystem.

1.1 About the stock

1.1.1 Fishery characteristics

518. YEM 9 is a shared fishery, targeted by commercial and recreational fishers in harbours and estuaries. It is also caught as bycatch by fishers targeting flatfish (FLA) and grey mullet (GMU).

519. Commercial fishers target yellow-eyed mullet with fine (55-65 mm) mesh set nets and ring nets in shallow coastal waters. Strong seasonal trends are evident in the landings data for each QMA with annual peaks mostly in July–August, indicating a winter fishery.

520. The commercial target YEM 9 fishery is localised. In recent years, the vast majority of YEM 9 estimated target commercial catch has been taken from statistical area 043, the Manukau Harbour. A large majority of YEM 9 taken as bycatch is also taken in the Manukau Harbour.

521. Recreational fishers primarily take yellow-eyed mullet by rod and line, followed by nets. Recreational fishers targeting yellow-eyed mullet with set nets must use net mesh 25 mm or larger. There is no bag limit for YEM 9.

1.1.2 Biology

522. Yellow-eyed mullet is a schooling finfish species that occurs commonly in the shallow coastal waters, estuaries, and lower river systems of New Zealand from North Cape to Stewart Island. Yellow-eyed mullet are omnivores, feeding on algae, benthic detritus, small invertebrates, polychaete worms, and fish.

523. It is a fast growing, short-lived species: research indicates the age at first spawning is approximately three years and the maximum age is likely seven years. Stock structure of yellow-eyed mullet in New Zealand waters is unknown.

524. Yellow-eyed mullet appear to leave their estuarine habitat to spawn in coastal waters over the summer from late December to mid-March. However, there is no information available on the age of recruitment into estuarine systems of New Zealand waters. Within estuaries and river systems, yellow-eyed mullet are separated to some extent by age, with older fish preferring more saline water and juveniles sometimes found in freshwater. The larger fish also prefer deeper water than juveniles.

1.2 Status of the stock

525. There is little information on which to evaluate YEM 9. Stock status of YEM 9 is unknown and there are no estimates of current or reference biomass, nor an estimate of fishing mortality. A lack of historical effort data has prevented Fisheries New Zealand from using Catch-per-unit-effort (CPUE) as an index of abundance for YEM 9.

526. As such, yield for YEM 9 cannot be estimated and it is not known whether current catch levels are sustainable. In the absence of a defined target and limits, Fisheries New Zealand relies on the draft Inshore Finfish Plan approach of monitoring the stock against trends in catch over time to ensure sustainability. Fisheries New Zealand recognises the limitations in using catch as an indicator of stock status, given the variety of factors that can influence catch levels.

527. Degradation of some YEM 9 estuarine and harbour habitat is known to have occurred, including in the Manukau Harbour which, in 2018, received an E grade on its Marine Report Card produced by the Auckland Council. The impact of this degradation on YEM 9 productivity is unknown but is likely to be unfavourable.

2 Catch information and current settings within the TAC

2.1 Commercial

528. The TACC for YEM 9 has never been fully caught. Since its introduction to the QMS in 1998, only 37% of the TACC has been caught on average annually. Landings appear to fluctuate about this low level without trend (Figure 2).

529. The current management settings are based on average landings during the period of 1982-1997, with an additional 10% added to recognize that YEM 9 is both a bycatch and a target species. Landings in the 1985-86 and 1986-87 fishing years were around three times greater than the average annual landings across the rest of the 1982-97 period (Figure 2).

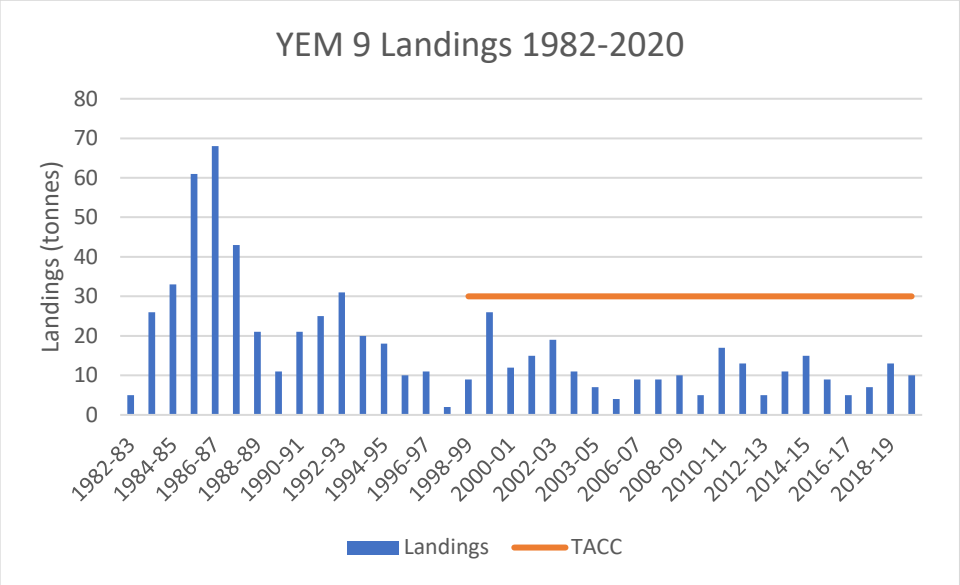

Figure 2: Annual YEM 9 landings since 1982. YEM 9 was introduced to the QMS in 1998.

530. The target YEM 9 commercial fishery is localised, exhibiting patterns of catch that could carry a risk of local depletion in some areas. In recent years, the vast majority of YEM 9 reported commercial catch has been taken from statistical area 043, the Manukau Harbour.

2.2 Customary Māori

531. Fisheries New Zealand holds no specific information to quantify customary take of YEM 9, making it difficult to ascertain whether the current customary allowance is reflective of customary take. This is because customary authorisations use a combined species code of MUU to report harvest of both YEM and GMU.

532. While Fisheries New Zealand cannot quantify customary take of YEM 9, feedback from the Iwi Fisheries Forums with an interest in this stock attests to the importance of YEM 9 as a customary fishery. One member of Nga Hapu o te Uru stated that YEM 9 is a main customary target in his rohe at Kawhia.

533. Table 2 lists the customary fisheries areas that fall within the quota management area of YEM 9. Commercial fishing is not permitted within mātaitai reserves unless bylaws state otherwise. Recreational fishing is allowed but may also be restricted under bylaws. All types of fishing are permitted within a Taiāpure unless the local community initiate a management process to

implement further regulation. To date, none of the customary fisheries areas listed in Table 2 have implemented regulations restricting customary or recreational take of YEM 9.

Table 2: Customary Fisheries Areas in YEM 9

Area	Management Type
Aotea Harbour Mātaitai Marokopa Mātaitai	Mātaitai Reserve
Kawhia Aotea Taiāpure	Taiāpure

2.3 Recreational

534. Yellow-eyed mullet are a popular recreational species throughout New Zealand, as their distribution and habitat preferences make them easily accessible to inshore fishers.

535. The most recent National Panel Survey of Marine Recreational Fishers (NPS) estimated a recreational harvest of 4.3 tonnes in YEM 9 in the 2017-18 fishing year. This estimate slightly exceeds the four-tonne allowance allocated to the recreational sector, although there is substantial uncertainty associated with the harvest estimate.

Table 3: Recreational harvest estimates for YEM 9.

Year	Method	Number of fish	Total weight (t)	CV
2011/12	Panel survey	20,535	4.1 t	0.34
2017/18	Panel Survey	14,830	4.3 t	0.49

2.4 All other mortality caused by fishing

536. There is no allowance set for other sources of mortality caused by fishing for YEM 9.

537. There is no information on the magnitude of all other YEM 9 mortality caused by fishing. The potential sources of other mortality for YEM 9 could include:

- unreported commercial bycatch,
- mortality associated with injury from smaller yellow-eyed mullet passing through set net mesh, as yellow-eyed mullet are known to be fragile;
- mortality associated with recreational catch and release;
- mortality associated with predation of yellow-eyed mullet in set nets; and,
- mortality associated with the accidental loss or damage of fishing gear, particularly set nets.

3 Treaty of Waitangi Obligations

3.1 Input and participation of tangata whenua

538. 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 can developed Iwi Fisheries Forum Plans that describe how the iwi in the Forum exercise kaitiakitanga over the fisheries of importance to them, and their objectives for the management of their interests in fisheries. Particular regard should be given to kaitiakitanga when making sustainability decisions.

539. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries.

540. Ahead of the November 2020 Iwi Fisheries Forum meetings, a short document describing the YEM 9 stock, Fisheries New Zealand's rationale for review, and initial management proposals was circulated to the northern forums with a potential interest in YEM 9: Te Hiku o Te Ika, Nga Hapu o Te Uru o Tainui, and the Mid-North.

541. Fisheries management representatives attended the November meetings of both Te Hiku o Te Ika and the Mid-North, while the November meeting of Nga Hapu o Te Uru o Tainui was postponed. The Mid-North expressed support for Fisheries New Zealand's review of YEM 9 and supported a decrease to the TAC and TACC. Te Hiku o Te Ika did not provide any specific feedback on the review of YEM 9 at its meeting.

542. At its December meeting, Nga Hapu o Te Uru expressed a preference for Option 3, to reduce the TACC by 20 tonnes, and to maintain the customary allowance at its current level of four tonnes. Forum members stated that YEM 9 is an important customary fishery in some rohe within YEM 9.

3.2 Kaitiakitanga

543. YEM 9 is listed as a taonga species by Te Hiku o Te Ika and Nga Hapu o Te Uru o Tainui in their respective Iwi Fisheries Forum plans. Fisheries New Zealand considers that the management options presented in this consultation paper are in keeping with objectives of the iwi fisheries plan, which generally relate to active engagement with iwi and the maintenance of healthy and sustainable fisheries.

Table 4: Iwi Fisheries Forum Plans relevant to YEM 9

Iwi Fisheries Forum	Relevant Plan Objectives/Outcomes
Te Hiku o Te Ika	• Management Objective: Fish stocks are healthy and support the social, cultural, and economic prosperity of Te Hiku iwi and Hapu • Management Objective: To maximise iwi influence on all key environmental decisions that impact on fisheries
Nga Hapu o Te Uru o Tainui	• Outcome 1: Fishery and its environment is healthy and sustainable • Management Objective 1: Nga Hapu o Te Uru kaitiaki are able to participate in and influence fisheries decision-making.

4 Environmental and Sustainability Considerations

4.1 Environmental principles (section 9 of the Act)

544. In response to the consistent under catch of YEM 9 and concerns about the impacts of habitat degradation on YEM 9 productivity, Fisheries New Zealand has included two proposed options that reduce the YEM 9 TAC and TACC. Reducing the TAC and TACC may reduce the environmental interactions associated with the fishery, depending on the magnitude of the reductions.

545. All of the environmental principles are mandatory considerations, the ones that particularly stand out in this fishery are:

Marine Food Web Interactions

546. Because of their small size, yellow-eyed mullet are an important food source to a variety of marine predators. Research has recorded yellow-eyed mullet in the diets of gannets and other coastal seabirds, as well as marine mammals such as dolphins and seals. Yellow-eyed mullet have also been recorded in the diet of barracoutas and are described in scientific literature as an important source of food for kahawai.

547. The range of predators suggests yellow-eyed mullet likely play an important role as a forage species in the inshore marine food web. Target fisheries on forage fishes may have knock-on effects for higher trophic levels, depending on the strength of the predator-prey relationships. FNZ lacks the data to evaluate the tightness of the predator-prey dynamics involving yellow-eyed mullet, making it difficult to make allowances that ensure sufficient YEM 9 is available for the marine ecosystem.

548. One submitter suggested that yellow-eyed mullet are a primary food source of Hector's dolphins and believes that Hector's dolphin numbers are declining in direct proportion to the decline in yellow-eyed mullet.

549. Fisheries New Zealand notes that YEM 9 covers areas of Māui dolphin habitat and that little is known about Maui dolphin diets. The best available information only allows Fisheries New Zealand to conclude that YEM 9 are eaten by Māui dolphins, but we are unsure of their importance in the dolphin diet. Fisheries New Zealand also notes that, because there is no estimation of current or reference YEM 9 biomass nor an accepted index of abundance, it is not possible to quantify any decline in YEM 9, even though there is qualitative evidence of several risks for the stock.

550. If the TAC and TACC were reduced to levels that resulted in a reduction in fishing effort (i.e., a constraining TACC), then the availability of yellow-eyed mullet to the ecosystem in YEM 9 may increase.

Localised Depletion

551. The localised nature of YEM 9 fishery and the magnitude of YEM 9 catch taken from the Manukau Harbour in recent years has raised concerns about the potential for localised depletion of YEM 9. Localised depletion of YEM 9 could affect food availability for, and the foraging habits of, predators that feed on yellow-eyed mullet in the Manukau Harbour.

552. A TACC that constrains catch in the broader YEM 9 QMA could potentially reduce the risk of localised depletion in a sub-area such as the Manukau Harbour, depending on the distribution of effort.

Fish bycatch

553. Concern has been expressed about the effects of the small-meshed nets used to fish yellow-eyed mullet on other species within estuarine systems. Kahawai (KAH 8) is the main bycatch species of the YEM 9 target fishery, followed by GMU 1, FLA 1, parore (PAR 9), trevally (TRE 7), and eagle ray (EGR). Of these species commonly caught by the YEM 9 target fishery, there is only a known sustainability concern with FLA 1.

554. If the TAC and TACC were reduced to a level that would be expected to lead to a reduction in fishing effort targeting YEM 9, then the bycatch associated with this fishery could be expected to decrease.

4.2 Sustainability measures (section 11 of the Act)

555. Section 11 of the Act sets out various matters that you must take into account or have regard to when setting or varying any sustainability measures (such as a TAC). These include any effects of fishing on the stock and the aquatic environment, the natural variability of the stock concerned, and any relevant fisheries plan. Matters relating to effects of fishing are addressed in the preceding sections.

556. The National Inshore Finfish Fisheries Plan (the Plan), currently being finalised, provides guidance on management objectives and strategies for finfish stocks such as YEM 9. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.

557. In the case of YEM 9, a Group 3 stock in the draft National Inshore Finfish Plan, the best available information is trends in catch. The options proposed in this paper respond to the ongoing trend of landings being well below the TACC, which may signal a sustainability concern.

558. Section 13 of the Act requires you to set a TAC for YEM 9 that enables the stock to be maintained at, or move towards, a level at or above that which can produce the *MSY*. The best available information on YEM 9 is insufficient to enable reliable estimates of *MSY* or the biomass that will produce it. Where reliable estimates of *MSY* are not available, section 13(2A) provides that you must use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above a level that can produce B_{MSY}.

5 Submissions

559. Fourteen submissions representing 16 submitters were received (Table 5). Of the 14 submissions, 12 supported a reduction to the TAC and TACC for YEM 9. Option 3 was the most popular of options proposed, with four submissions in support.

Table 5: Written submissions and responses received for YEM 9 (in alphabetical order)

Submitter	Option Support				
	1	2	3	Other	
A. Flavell-Johnson				✓	Supports decrease in catch limits for this species but did not specify preferred option.
C. Murphy			✓		
D. Mladak				✓	Supports decrease in catch limits but did not specify preferred option.
Environmental and Conservation Organisations NZ (ECO)				✓	Supports reducing TACC to current catch level but did not specify preferred option.
Fisheries Inshore NZ (FINZ)				✓	No preferred option identified
Forest and Bird NZ			✓		
Iwi Collective Partnership (ICP)				✓	Supports option proposed by Te Ohu Kaimoana
Joint submission: LegaSea, NZ Sport Fishing Council (NZSFC) and NZ Angling and Casting Association (NZACA)			✓		
M. Currie			✓		Supports decreases across all stocks
NZ Recreational Fishing Council				✓	Support a modified Option 3: increase other mortality allowance to 2 tonnes, setting TAC of 20 tonnes
Te Arawa Fisheries Group				✓	Supports option proposed by Te Ohu Kaimoana
Te Ohu Kaimoana				✓	Supports a new option with an intermediate TACC between Options 2 and 3
T. Walker	✓				
Wellington Recreational Marine Fishers Association, J. Mikoz				✓	Would prefer a lower TAC (6 tonnes), with no commercial catch of the stock

6 Options and analysis

560. Fisheries New Zealand has not included an option to retain the status quo TACC. This is because the current management settings do not include an allowance for other sources of mortality caused by fishing. We recommend that an allowance for all other mortality caused by fishing be set to account for unrecorded mortality of fish associated with fishing.

561. In the absence of information to quantify the mortality associated with other sources, Fisheries New Zealand proposes a nominal allowance of one tonne. This is considered appropriate given the biological characteristics of the stock and expected mortality caused as a result of gear interactions and recreational catch and release. All three options include a new, one-tonne allowance to account for other sources of mortality caused by fishing.

6.1 Option 1

TAC: 38 –	**TACC:** 29 ↓ (1 t)	**Customary**: 4 –	**Recreational**: 4 –	**Other mortality**: 1 ↑

562. Option 1 maintains the status quo TAC and reduces the TACC by one tonne in order to create an allowance for other sources of mortality caused by fishing.

563. The one-tonne reduction in the TACC is not expected to result in any reduction in revenue, as the TACC is currently under caught by 19.5 tonnes on average annually. Fishers should remain unaffected.

564. This option does not address the potential sustainability risk associated with the current management settings. It does not address the current under catch, nor does it address concerns about the impacts of environmental degradation on YEM 9 productivity and the consequences of potential YEM 9 decline on the wider marine ecosystem.

565. Option 1 was supported by one submitter.

6.2 Option 2 - Preferred

TAC: 26 ↓ (12 t)	**TACC:** 17 ↓ (13 t)	**Customary**: 4 –	**Recreational**: 4 –	**Other mortality**: 1 ↑

566. Option 2 reduces the TAC of YEM 9 by 12 tonnes, the TACC by 13 tonnes, and sets a one tonne allowance for other sources of mortality caused by fishing.

567. This option takes a pragmatic approach to addressing the potential sustainability risk associated with the current management settings. It responds to the under-catch evident in the current commercial catch allowance and proposes a TAC and TACC that align with the fishery's demonstrated capability. In doing so, this option discourages further growth in this fishery until more information on the status of this stock can be obtained.

568. By setting a TACC equivalent to the highest annual landings in the last 10 years, this option is designed to accommodate the variability evident in recent catch trends (Figure 2).

569. As Option 2 is not designed to reduce catch below current levels, effort in the target fishery will likely remain the same. Revenue and the effects of fishing are therefore not expected to change under this option.

570. No submitters supported Option 2, although three submitters who supported a decrease to catch limits did not state a preference between Options 2 and 3. The Mid-North also expressed support for a decrease to the TAC and TACC at its November meeting but, as options were not available at this time, no preference could be provided.

6.3 Option 3

TAC: 19 ↓ (19 t)	**TACC:** 10 ↓ (20 t)	**Customary**: 4 –	**Recreational**: 4 –	**Other mortality**: 1 ↑

571. Option 3 reduces the TAC by 19 tonnes and the TACC by 20 tonnes and sets a one tonne allowance for other sources of mortality caused by fishing.

572. Option 3 would set a TAC and a TACC that actively constrain catch below recent levels based on average recent landings. The average annual landings of YEM 9 between 2001-2020 were 10.3 tonnes, while the average annual landings from 2010-2020 were 10.5 tonnes. Setting a TACC of 10 tonnes would actively constrain catch in addition to discouraging further growth in this fishery, at least in some fishing years.

573. Option 3 takes a more precautionary management approach for this low information stock. Such an approach may be warranted, considering its role as forage for other marine organisms, known degradation of its habitat, and the fact that YEM 9 is listed as a taonga species by two iwi fisheries forums.

574. If future catches mirror recent landings, this option would require commercial fishers to change their behaviour to avoid incurring deemed values, at least in some fishing years.

575. In years where the TACC actively constrains catch, this setting will likely increase the availability of YEM 9 to the ecosystem. The importance of YEM to the broader marine ecosystem was highlighted by several submitters who favoured this option.

576. A constraining TACC would also reduce the level of bycatch associated with this fishery. As the joint submission from NZSFC, Legasea, and NZACA points out, this bycatch may include the juveniles of other species that rely on harbours and estuaries as nursery areas.

577. A TACC that constrains catch in the broader QMA could reduce the risk of localised depletion in a sub-area such as the Manukau Harbour. However, given that landings have averaged 10.5 tonnes over the past 10 years and Option 3 is proposing a TACC of 10 tonnes, Option 3 is unlikely to appreciably reduce this risk.

578. The variability in YEM 9 catches across fishing years makes it difficult to estimate the annual reduction in revenue that could arise from Option 3. Based on the average landings of 10.5t over the past 10 years, this option would lead to a reduction in annual revenue of approximately $2,027.80. When calculated based on the recent peak landings of 17 tonnes in 2010-2011, the annual revenue reduction would be $28,389.20. In a hypothetical situation where the TACC is fully caught, revenue would be reduced by $81,112. Because the TACC has never been fully caught, the potential impact is unlikely to be this large.

579. Option three was the most popular option, with four submissions (representing six submitters) in favour. Nga Hapu o Te Uru also expressed support for Option 3 at its December meeting.

580. Those submitters who supported Option 3 emphasised the role of yellow-eyed mullet in the ecosystem, noting their role as an important food source for a number of species justifies a precautionary management approach.

581. Many of these submitters also suggested that a precautionary approach is needed in the absence of information on YEM 9.

6.4 Other options proposed by submitters

Eliminating the YEM 9 TACC

582. Jim Mikoz believes that the proposed options do not sufficiently address sustainability concerns. In his submission, he proposed a fourth option that would set the TAC at six tonnes and allocate those six tonnes among customary, recreational, and other sources of mortality. Mr. Mikoz states the commercial fishery should be eliminated (i.e., a TACC set to zero tonnes), as the commercial industry has no interest in the fishery.

583. Although it expressed support for a modified Option 3, the RFC stated that it would also support making YEM 9 a non-commercial fishery only, given its low value as a commercial fishery and its importance to recreational and customary fishers.

584. Fisheries New Zealand notes that catch and landings data suggest there is a commercial interest in the YEM 9 fishery and considers that elimination of the TACC would be inconsistent with the obligations under the Act to provide for utilisation while ensuring sustainability.

Setting the TACC at 15 tonnes

585. Te Ohu Kaimoana noted that catches have remained relatively stable over the past 20 years, but at a level much lower than the current TACC. Acknowledging that the current TACC could pose a sustainability risk if fully utilised, Te Ohu Kaimoana has proposed an alternative option that would set the TACC at 15 tonnes. This option would set the TACC at a level between those proposed in Options 2 and 3. Te Ohu's rationale for this alternative option is that annual catches over the last 20 years tended to fluctuate within the 5-15 tonne range, and so setting the TACC at 15 tonnes would accommodate current catch levels. Both Te Arawa Fisheries Group and the Iwi Collective Partnership voiced support for this alternative option.

586. Fisheries New Zealand notes that the range stated in Te Ohu's submission omits the YEM 9 landings in 2002-03, 19 tonnes, and the landings in 2010-11, 17 tonnes. A 15 tonne TACC could therefore be expected to accommodate current catch levels in most, but not all, years based on historical landings from the past 20 years.

Increasing the other mortality allowance

587. RFC expressed concerns that the scale of YEM 9 mortality associated with 'juvenile fishers' (i.e. children) may be quite large. For that reason, NZ RFC proposed a modified Option 3 with a TAC of 20 tonnes to allow for an increased other mortality allowance of two tonnes.

588. The other mortality to the stock caused by fishing allowance is intended to represent the additional mortality to a stock that is caused by fishing but not captured in catch estimates. Fisheries New Zealand has no data to assess the magnitude of recreational discards in the YEM 9 fishery, nor the mortality associated it. Given this uncertainty, Fisheries New Zealand sees little value in increasing the proposed other mortality allowance to two tonnes.

ACE Market Concerns

589. FINZ noted that more work was needed to ensure that any management setting change for YEM 9 would not impact the ACE market nor constrain utilisation opportunities.

590. The purpose of this review is to address a potential sustainability risk with the current management settings. Constraining utilisation may be necessary to address this sustainability risk. There is the potential for reductions in the TAC to impact on the availability and price of ACE. Fisheries New Zealand notes this is not a statutory consideration for setting or varying the TAC but rather a natural consequence of addressing a potential sustainability risk to the stock.

6.5 Deemed values

591. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements.

592. The current deemed value rates for YEM 9 are shown in Table 6.

Table 6: Current deemed value rates ($/kg) for YEM 9

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
YEM 9	0.30	0.33	0.33	0.33	0.33	0.33	0.33

593. According to data from 2020/21, the current deemed value rates of YEM 9 currently fall between the average ACE price ($0.27/kg) and port price ($4.06/kg).

594. Two submitters supported raising the deemed values for YEM 9. Te Ohu Kaimoana noted the current deemed value is too close to the ACE price relative to the port price, and that a reduction to the TACC could result in an ACE price greater than the current deemed value. If this were to occur, then deemed values would not provide sufficient incentive to balance YEM 9 catch against ACE.

595. As the options proposed reflect current levels of catch in the most recent years, Fisheries New Zealand considers it unlikely that reductions in the TACC would significantly impact on YEM 9 ACE prices. With approximately 23%-37% of available ACE utilised over the last three complete fishing years, it is reasonable to expect that the ACE market would be able to withstand reductions in the TACC as the fishery is not highly utilised/competitive. As such, changes to the YEM 9 deemed values are not being considered at this time.

596. Fisheries New Zealand will continue to monitor the market and, if the YEM 9 ACE price does exceed current deemed values, then YEM 9 will be proposed for consideration by the Catch Balancing Review Process, an annual process whereby the management settings of stocks with catch balancing issues are reviewed.

7 Other considerations

YEM 9 Biology

597. Fisheries New Zealand notes that a submission received from Jim Mikoz disputes much of the biological information presented in the YEM 9 consultation document and reiterated above. Mr. Mikoz has reached different conclusions based on his own research and observations.

598. Fisheries New Zealand must rely on the best available information which, in the case of yellow-eyed mullet, consists of the Fisheries Assessment Plenary and the additional published, peer-reviewed scientific literature referenced in the consultation document. Following Mr. Mikoz's submission, Fisheries New Zealand has again reviewed the plenary and additional scientific literature and is confident that the advice contained within this paper is consistent with the best available information on yellow-eyed mullet.

Reviewing all YEM Stocks

599. Several submissions referenced a decline in sightings of yellow-eyed mullet schools around New Zealand, and two submitters suggested that Fisheries New Zealand should review all yellow-eyed mullet stocks. Fisheries New Zealand will take this into consideration when prioritizing stocks for future review.

Addressing localised depletion

600. The RFC also noted the importance of YEM 9 to recreational and customary fishers, particularly as a food source for communities around the Manukau. The RFC also noted that there is competition between commercial and recreational fishers targeting yellow-eyed mullet in the Manukau Harbour, and that FNZ should take corrective actions to prevent the commercial sector from taking the vast majority of its YEM 9 landings from statistical area 43.

601. Generally, Fisheries New Zealand's management approach is to enable fishers the freedom to fish wherever is most convenient and successful for them. However, where there is sufficient evidence to demonstrate a spatial conflict between sectors, Fisheries New Zealand has processes to engage with fishers and devise solutions. Other spatial conflicts have been addressed through voluntary agreements between sectors, method restrictions, and area closures.

602. A voluntary catch spreading arrangement or spatial separation between commercial and non-commercial fisheries may be worth considering for YEM 9 once Fisheries New Zealand has several years of electronic reporting data from the commercial fishery. The finer spatial data provided by electronic reporting will facilitate the development of suitable spatial management options.

Impacts of habitat degradation

603. The submissions shared a general consensus that poor water quality and habitat degradation in the Manukau pose a sustainability risk to the YEM 9 fishery. Jim Mikoz and the RFC also stated that the removal of beach cast seaweed by councils has deprived yellow-eyed mullet of a valuable food source, and that the removal of raupo stands in estuaries has denied yellow-eyed mullet essential habitat. FINZ noted that the management options proposed in this paper do nothing to address habitat degradation.

604. While managing habitat degradation that is not an effect of fishing is beyond the scope of Fisheries New Zealand's responsibilities, it is incumbent on Fisheries New Zealand to work with the responsible agencies to ensure that marine and estuarine habitat degradation and its effects on fisheries resources are considered throughout their decision-making processes.

8 Conclusions and recommendations

605. Fisheries New Zealand recommends that you decrease the TAC and TACC for YEM 9, with our preferred option being Option 2.

606. Over the past 20 years, YEM 9 catch levels have fluctuated at a level well below the current TACC without trend. This suggests that current catch levels are sustainable, but that there is a potential sustainability risk if the TACC were to be fully utilised.

607. Option 2 aligns the TACC with the YEM 9 fishery's demonstrated capability in the past 10 years. In doing so, Option 2 addresses the potential sustainability risk associated with the current management settings and discourages further growth in the fishery in the absence of information on stock status.

608. Should you wish to take a more cautious approach to the management of YEM 9— which may be warranted given documented habitat degradation, the importance of YEM 9 to the marine ecosystem, and our lack of information on stock status—then Option 3 may be more appropriate. By setting a TACC below the average landings over the past 10 years, this option could constrain potential future catch.

9 Decision for YEM 9

Option 1

Agree to set the YEM 9 TAC at 38 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 4 tonnes;
ii. Retain the allowance for recreational fishing interests at 4 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 1 tonne;
iv. Decrease the YEM 9 TACC from 30 to 29 tonnes.

~~Agreed / Agreed as Amended~~ / Not Agreed

OR

Option 2 *(Fisheries New Zealand preferred option)*

Agree to set the YEM 9 TAC at 26 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 4 tonnes;
ii. Retain the allowance for recreational fishing interests at 4 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 1 tonne;
iv. Decrease the YEM 9 TACC from 30 to 17 tonnes.

Agreed / ~~Agreed as Amended / Not Agreed~~

OR

Option 3

Agree to set the YEM 9 TAC at 19 tonnes and within the TAC:

i. Retain the allowance for Māori customary non-commercial fishing interests at 4 tonnes;
ii. Retain the allowance for recreational fishing interests at 4 tonnes;
iii. Set the allowance for all other sources of mortality to the stock caused by fishing at 1 tonne;
iv. Decrease the YEM 9 TACC from 30 to 10 tonnes.

~~Agreed / Agreed as Amended~~ / Not Agreed

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021

Proposal to close Cockle Bay/Tuwakamana to intertidal shellfish harvesting

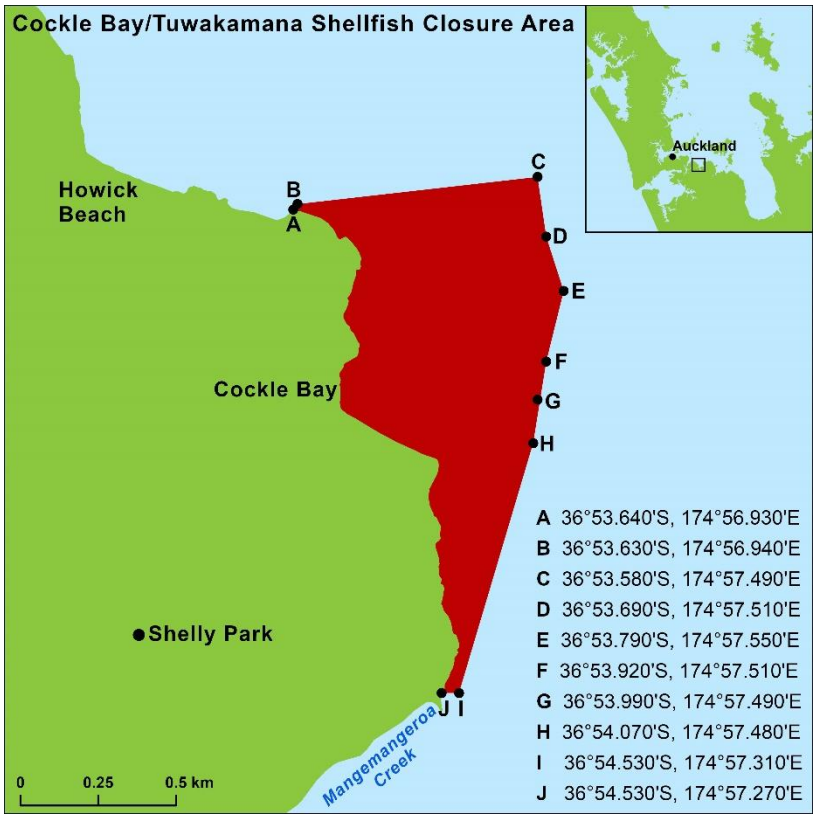

Figure 1: Existing seasonal closure area at Cockle Bay/Tuwakamana.

Table 1: Summary of options proposed for the management of intertidal shellfish at Cockle Bay/Tuwakamana. The preferred option of Fisheries New Zealand is highlighted in blue.

Option	Management Action	
Option 1 *(Status quo)*	No changes made to the existing management regime for intertidal shellfish at Cockle Bay/Tuwakamana	
Option 2	Revoke the existing seasonal closure at Cockle Bay/Tuwakamana and replace it with a full year-round closure to the recreational taking of intertidal shellfish as a sustainability measure under section 11 of the Fisheries Act 1996-the closure would be done by notice in the *Gazette*.	
New option incorporated following consultation	No	
Total submissions received	81	
Number of submissions received in support of each option	Option 1	1
	Option 2	79
	Other	1

1 Why are we proposing that you close Cockle Bay/Tuwakamana to the recreational take of intertidal shellfish year-round?

609. The best available information suggests there is a potential sustainability risk to the cockle population at Cockle Bay/Tuwakamana. The information includes a recent decline in the number and density of large (≥30 mm shell length) cockles and a decrease in the mean and modal shell length of the surveyed population, as documented by the Northern North Island Intertidal Shellfish Survey.

610. Large cockles are disproportionately targeted by harvesters. While there are numerous environmental and anthropogenic factors that influence the abundance and size of cockles at a beach, it is likely that harvest pressure is at least partially responsible for the decline in the number of large cockles present at Cockle Bay/Tuwakamana.

611. The existing seasonal closure, which applies to the take of all intertidal shellfish at Cockle Bay, is failing to prevent the decline in the abundance of large cockles. A year-round closure will fully remove one anthropogenic pressure currently affecting the cockle population at Cockle Bay/Tuwakamana, thereby improving the likelihood of a recovery in large cockle abundance, a shift of the length frequency distribution back towards larger sizes, and an increase in mean and modal shell length.

612. Because evidence from recent surveys suggests that cockle recruitment and total abundance are strong, Fisheries New Zealand is proposing to review the closure after a period of three years to determine whether it should remain in place.

2 About the intertidal shellfish fishery at Cockle Bay/Tuwakamana

2.1 Fishery characterisation

613. Cockle Bay/Tuwakamana is located on the Hauraki Gulf coast of Auckland. It is a small bay of approximately 400 m in length sitting within an urban context, with beach-front reserves and car parks backed by residential properties. While closed to commercial shellfish harvesting, the site is a very popular location for recreational harvesters gathering cockles.

614. Although harvesters primarily target cockles at Cockle Bay/Tuwakamana, they also gather other intertidal shellfish species, including pipi, crabs, and green-lipped mussels. Intertidal shellfish are gathered by hand.

615. There are no reliable estimates of recreational intertidal shellfish harvest, including at Cockle Bay/Tuwakamana. While the National Panel Survey of Marine Recreational Fishers (NPS) does produce harvest estimates for cockles and pipi, Fisheries New Zealand considers that intertidal shellfish harvesting is not well represented in such surveys given the sporadic and dispersed nature of the activity, and that these figures may underestimate the reality of what is taken.

616. Fisheries New Zealand has little information to indicate the presence of a customary fishery for intertidal shellfish at Cockle Bay/Tuwakamana, with only one record of an authorisation for cockle harvest and several recorded authorisations for green-lipped mussel harvest being granted under regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013 in the vicinity in the last 20 years. However, Fisheries New Zealand recognises that customary fishers may currently rely on amateur bag limits to meet their needs at Cockle Bay/Tuwakamana.

2.2 Cockle Biology

617. Cockles (*Austrovenus stutchburyi),* or tuangi, are suspension feeding bivalves found in soft mud to fine sand on sheltered beaches and enclosed shores around the North and South Islands, Stewart Island, the Chatham Islands, and the Auckland Islands.

618. Cockles are short-lived and growth rates among their populations are highly variable. Cockles generally reach sexual maturity at 18 mm shell length and usually attain a length of 30 mm within two to five years, reaching a maximum length of around 40 mm.

619. Cockles spawn over spring and summer, and fertilisation is followed by a planktonic larval stage lasting about three weeks. Connectivity among cockle populations is poorly understood and likely varies by site, though some beds may benefit from larva dispersed from other locations. Significant depression of larval settlement has been recorded for areas of otherwise suitable habitat from which all live cockles have been removed, suggesting that live adult cockles may provide some sort of settlement cue for larva.

620. Like other intertidal shellfish resources, cockle populations fluctuate naturally and are vulnerable to environmental degradation. Potential stressors, other than human harvesting, to infaunal bivalves like cockles include:

- anthropogenic contaminants such as organotin compounds and biocides (such as those associated with marine antifoulants), heavy metals, organochlorines and polyaromatic hydrocarbons;
- changes in the marine environment associated with human activity, such as increased sediment loading, nutrient enrichment, and climate change; and,
- natural phenomena of an extraordinary nature such as harmful algal blooms, heat stress and diseases/parasite events.

2.3 Current management approach

621. Recreational harvest of intertidal shellfish is controlled primarily by bag limits. A daily bag limit is intended not only to ensure sustainable harvesting levels, but also to share the resource between individual fishers. As there are no constraints on the number of recreational harvesters, overall recreational harvest of intertidal shellfish is unconstrained.

622. Like many Auckland beaches, Cockle Bay's accessibility and proximity to the large population centre make it vulnerable to significant harvesting pressure. This additional harvest pressure prompted Fisheries New Zealand to introduce reduced daily bag limits for a number of shellfish species in the Auckland Coromandel area in 2001.

623. In addition to the general bag limits, site-specific management measures have been employed around the Auckland region to provide more targeted management of specific shellfish populations. Community concerns regarding the state of the cockle beds at Cockle Bay prompted the then Ministry of Fisheries to explore additional site-specific management options for the cockles at Cockle Bay/Tuwakamana back in 2007.

624. In 2008, a seasonal closure was implemented to address the sustainability risk posed to cockles by harvesting pressure. The seasonal closure prohibits the harvesting of all intertidal shellfish at Cockle Bay/Tuwakamana over the summer period between 1 October and 30 April each year. Additionally, Cockle Bay/Tuwakamana was added to the list of beaches surveyed by the Northern North Island Intertidal Shellfish Survey, beginning with the 2009-10 survey year.

3 Status of the cockle beds at Cockle Bay/Tuwakamana

625. The cockle beds at Cockle Bay/Tuwakamana have been surveyed by the Northern Intertidal Shellfish Monitoring Survey seven times beginning with the 2009-10 fishing year. Each iteration of the survey provides estimates of cockle distribution, abundance, and size frequency at the survey site.

626. A recent review of the results from these seven surveys identified a potential sustainability risk with the cockle population. The 2019-20 survey indicates a significant decrease in the abundance and density of large cockles from a peak of 36.46 million in 2012 to 11.75 million in 2019. There were consecutive declines in abundance from this 2012 peak in the 2013-14 and 2015-16 surveys, followed by a slight increase in 2017-18, and then another decrease in the 2019-20 survey (Figure 2). The total number of large cockles is at its lowest level since the first survey of Cockle Bay/Tuwakamana in the 2009-10 fishing year.

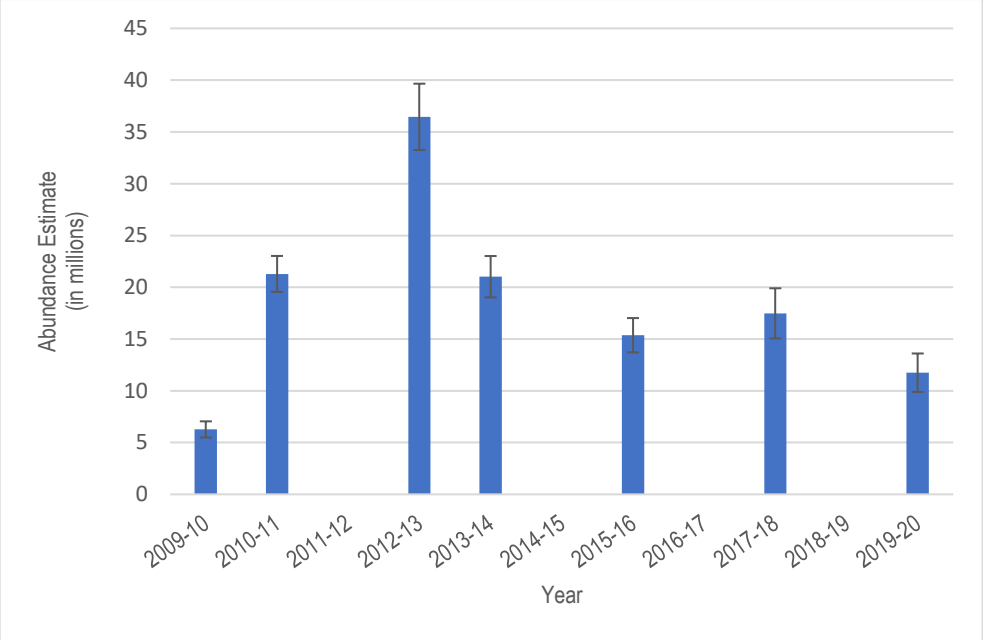

Figure 2: Abundance estimate of large cockles (≥30 mm) at Cockle Bay/Tuwakamana from the Northern Intertidal Shellfish Survey, 2009- present. Years without bars indicate no survey was undertaken at Cockle Bay/Tuwakamana that year.

4 Treaty of Waitangi Obligations

4.1 Input and participation of tangata whenua

627. 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 can develop Iwi Fisheries Forum Plans 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 interests in fisheries. Particular regard should be given to kaitiakitanga when making sustainability decisions.

628. Under Section 12(1)(b) of the Act, you must have particular regard to kaitiakitanga before setting or varying any sustainability measure. Under the Act, kaitiakitanga is the exercise of guardianship, and in relation to any fisheries resources, includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate tangata whenua in accordance with tikanga Māori.

629. To facilitate input and participation, Fisheries NZ developed a summary on the proposed s11 closure and circulated it to iwi with an interest in Cockle Bay/Tuwakamana.

630. The proposal has been discussed with Ngaitai ki Tamaki representatives, who expressed support for the closure. Ngaitai ki Tamaki notes that, in addition to their value as a food source, cockles provide an important ecosystem function in their role as filter feeders. Healthy populations support improved water quality.

631. Ngaitai ki Tamaki expressed concern about the large numbers of harvesters preventing the recovery and/or maintenance of shellfish beds. It emphasized the importance of a wide range of sizes in the cockle population, and not just a large population of small shellfish.

5 Submissions

Table 2: Written submissions and responses received for the Cockle Bay/Tuwakamana proposal.

Submitter	Option Support			
	1	2	Other	
Auckland conservation board		✓		
Cockle Bay Residents and Ratepayers Association		✓		
Forest and Bird NZ		✓		
Howick Local Board		✓		
J. Dickson		✓		supports a complete closure for 9 years, with reviews conducted at the end of each 3-year period
Recreational Fishing Council	✓			Would support other management tools e.g. reduced season or bag limit
Te Ohu Kaimoana			✓	Supports a full year-round closure to the taking of cockles only, rather than all shellfish
Other Individual submitters: A. Dow, A. Martin, A. Johnson, A. & M. Empson, A. Smart, B. Vazifdar, B. Kendall, B. Wood, C. Longley, C. Koh, C. Meale, C. Dixon, C. Nunn, D. Nunn, D. Moore, D. Gerritz, E. Stehr, E. McCormick, F. Rankin, F. Grant, F. Lombard, G. Nicholls, G. Unkovich, G. Mackereth, Image Doors NZ Ltd, I. Dow, I. Barry, I. Isolde, J. Dickson, J. Berntsen, J. Derrick, J. Annabell, J. Riddell, J. Grant, J. Anderson, J. Mitchell, K. Keenan, K. Williams, K. Bonniface, L. Haworth, L. Robinson, L. Murray, L. Clark, L. Stranaghan, M. South, M. & J. Carson, M. Powell, M. Muggeridge, M. Brajkovich, M. McGinty, M. Suasua, M. Currie, M. Mutti, M. Keys, N. Stalker, N. & R. Driver, N. Pasco, P. Hickey, P. Bankers, P. Cunningham, P. Ivin, P. Jenkins, P. Winchester, R. & C. Brajkovich, R. Stanley, R. Williams, R. Ritchie, R. Grant, S. Dawson, S. & K. Feek, S. Ryan, S. Robertson-Bickers, V. Hancock, W. Van As, Y. Bark		74		
Total submissions = 81	**1**	**79**	**1**	

632. Of the 81 submissions received, 79 supported Option 2, the proposal to implement a year-round closure to recreational intertidal shellfish harvesting at Cockle Bay/Tuwakamana. The vast majority of submitters are local residents, and many included personal accounts of cockle decline in their submissions. One submitter, the New Zealand Recreational Fishing Council (RFC), supported Option 1. Te Ohu Kaimoana proposed an alternative option to close the beach to recreational take of cockles only.

633. All of the submitters expressed concern regarding the state of the cockle beds and the sustainability of current harvesting levels. Some submitters attributed the decline to the sheer number of harvesters picking cockles at Cockle Bay, while others noted instances of individual harvesters exceeding bag limits.

634. Some submissions indicated that limited enforcement capacity has reduced the effectiveness of current management controls. Two submitters wrote that a full, year-round closure would make it easier for members of the public to promptly identify and report violations to Fisheries Officers via the poaching hotline.

635. In addition to the sustainability of the resource, many submissions also cited the health of the ecosystem as rationale for the closure. Submitters emphasized the role that cockles play in the ecosystem as bioengineers and their value as food sources for crabs, whelks, and birds. They also referenced cockles' ability to improve water quality as filter feeders. The Auckland Conservation Board felt that the consultation document was remiss in failing to document all of the ecosystem services provided by cockles.

Customary Harvest Authorised under the Fisheries (Amateur Fishing) Regulations of 2013

636. Four submitters disapproved of allowing Māori to exercise their customary rights authorised under regulations 50 and/or 52 of the Fisheries (Amateur Fishing) Regulations 2013 at Cockle Bay/Tuwakamana. There is concern that customary harvest would negatively impact the bed's recovery and could inadvertently encourage iwi and hapu within the greater Auckland region to authorise harvest at the beach under r50. This would be detrimental to the local iwi's efforts to protect intertidal shellfish resources at Cockle Bay/Tuwakamana.

637. Fisheries New Zealand acknowledges the possibility that the closure of the beach to recreational harvest might attract more interest from customary harvesters, potentially leading iwi and hapu from the broader Auckland region to grant authorisations for take at Cockle Bay/Tuwakamana, despite the wishes of the local iwi. If this were to occur, it could result in harvest levels that impede recovery of the cockle beds.

638. However, as this would be in direct contrast to kaitiakitanga, Fisheries New Zealand views it as an unlikely possibility. Fisheries New Zealand has only one record of an authorisation being granted for harvest at Cockle Bay in the past 20 years; this authorisation was granted in 2011.

639. Throughout the proposed closure, Fisheries New Zealand would continue to conduct periodic surveys of the cockle beds. Should survey results indicate that the bed is not recovering despite the s11 closure, then Fisheries New Zealand would share this information with Treaty Partners and support them in implementing any changes to the management of customary harvest they might choose to make.

6 Options and analysis

6.1 Option 1

640. Option 1 is the status quo. Under this option, no changes would be made to the existing management regime for intertidal shellfish at Cockle Bay/Tuwakamana. Harvesting would continue to be permitted during the open season between 1 May and 30 September, subject to existing bag limits.

641. This option would ensure continued utilisation opportunities for intertidal shellfish harvesters during the open season, at least in the short term.

642. This option poses a potential sustainability risk as it does not address the recreational harvest pressure on cockle beds during the open season at Cockle Bay/Tuwakamana. Continuing to permit recreational cockle harvest during the open season could lead to further declines in the abundance of large cockles and a further shift in the length-frequency distribution of the cockle population towards smaller individuals. If the decline continues, larval settlement could become depressed and recruitment could suffer.

643. One submitter, the RFC, supported Option 1, as it does not believe that a full s11 closure is the best management tool for cockles at Cockle Bay/Tuwakamana. The Council expressed concern that a closure could shift pressure to other beaches that are more difficult to monitor and manage.

6.2 Option 2 - Preferred

644. Option 2 proposes to revoke the existing seasonal closure at Cockle Bay/Tuwakamana and replace it with a full, year-round closure to the recreational harvest of intertidal shellfish as a

sustainability measure under s11 of the Act. This closure would not apply to customary harvest authorized under r50 or r52 of the Fisheries (Amateur Fishing) Regulations 2013 and would be reviewed by Fisheries New Zealand following three years of implementation.

645. Closing the beach to recreational intertidal shellfish harvesting removes one anthropogenic pressure currently affecting the cockle population at Cockle Bay/Tuwakamana, thereby improving the likelihood of a recovery in large cockle abundance, a shift of the length frequency distribution back towards larger sizes, and an increase in mean and modal shell length.

646. Closures are generally favoured as they are simple for harvesters to understand and more easily implemented and enforced. At Cockle Bay/Tuwakamana, cockles are the dominant intertidal shellfish species, but pipi, crabs, and green-lipped mussels are also known to be present. The existing seasonal closure applies to all intertidal shellfish species. For ease of implementation and enforcement, the proposed full year-round closure would apply to the recreational harvest of all intertidal shellfish species at Cockle Bay/Tuwakamana.

647. A s11 closure at Cockle Bay/Tuwakamana will deny recreational harvesters utilisation opportunities. This could result in displacement of harvest effort to other beaches in the region, although the potential magnitude of displaced effort and the beaches likely to receive this displaced effort are difficult to predict.

648. A review following three years' closure is proposed because evidence from recent surveys suggests that recruitment is strong and total abundance has increased in each of the last three surveys. This closure is intended to enable recent recruits to grow to larger sizes in the absence of harvest pressure and, as cockles tend to reach a shell length of 30 mm at between two and five years of age, Fisheries New Zealand views that a period of three years should be sufficient to determine whether the closure is working as intended.

649. This option was supported by 79 of the 81 submissions received.

6.3 Other options proposed by submitters

Apply Closure to Cockles Only

650. Te Ohu Kaimoana proposed an alternative option to implement a year-round closure to the recreational taking of cockles only. Te Ohu believes that applying a s11 closure to the recreational take of all intertidal shellfish when there is only a known concern with the cockle population is inconsistent with s11 and the purpose of the Act.

651. Fisheries New Zealand agrees in principle with Te Ohu Kaimoana's position that, to be consistent with s11, management intervention should apply only to the species for which there is a known sustainability concern. However, in the case of Cockle Bay, FNZ believes the deviation from the single species management approach is warranted, considering that a single species approach would place an extraordinary burden on Fisheries Compliance and could compromise the effectiveness of the closure.

652. Applying the closure to the aggregate of intertidal shellfish species increases the efficiency of compliance operations by making it easier for Fisheries Officers (FOs) and the community to identify non-compliance.). Greater efficiency means FOs will be able to cover more ground than they might if enforcing a cockle-only closure at Cockle Bay/Tuwakamana, potentially increasing effectiveness of the closure. From a compliance perspective, it is therefore preferable to continue to apply fisheries management measures at Cockle Bay for the aggregate of shellfish species rather than for cockles only.

Use Other Management Tools

653. The RFC asked whether Fisheries New Zealand had considered shortening the open season to three months or reducing the bag limit rather than implementing a year-round closure. It also identified a need for increased education and compliance efforts.

654. While a shortened open season would reduce further the harvesting pressure on the cockle beds, the existing seasonal closure has failed to prevent a substantial decline in the number of

large cockles. Fisheries New Zealand views that a more drastic intervention is required at this time to ensure sustainability of the cockle beds. A further reduction to the bag limit was not considered in this review, as the consensus reached during previous reviews was that a bag limit of 50 cockles per person per day was the bare minimum harvesters would accept.

Expand Closure Area

655. While he supports Option 2, Bruce Kendall stated that the closure should start at Shelly Beach and follow the coastline to Wakaranga Creek Reserve inside the Tamaki River. He called for a study of beaches along this coastline and efforts to remediate the damage done to these beaches.

656. This proposed extension would also encompass Howick Beach, Eastern Beach, and Bucklands Beach. Fisheries New Zealand notes that Eastern Beach has been closed to shellfish harvesting since 1993. Fisheries New Zealand is not aware of harvest concerns at Howick Beach nor Bucklands Beach and neither is surveyed as part of the Intertidal Shellfish Survey, but if new information suggesting a sustainability concern at either of these beaches came to light, then Fisheries New Zealand would consider closures for those beaches.

Lengthen Closure Period

657. Several submitters indicated that three years should be the minimum length of the closure. FNZ would like to reiterate that it is proposing a permanent, year-round closure which will be reviewed after three years to determine whether the beach could be reopened to provide for utilisation. The status of the cockle beds at the time of review will determine whether FNZ recommends revoking the permanent closure.

Suggestions for Future Management

658. In addition to expressing their support for the year-round closure proposed in Option 2, several submitters provided recommendations for future management in the event the bed is reopened to harvest after three years.

659. Matthew McGinty suggested that you consider alternating years during which harvest is permitted during the open season with years during which the fishery is closed for the entire year. Alternatively, he wrote, if FNZ wishes to reopen the beach for harvest every year, it should shorten the open season to three months, running from 1 June – 30 September. Mark and Janine Carson noted the difficulty of monitoring beaches in person and asked about the possibility of using cameras to monitor people collecting shellfish and their license plates.

660. An alternating harvest scheme would allow the cockle beds to recover during “off” years in the absence of harvesting pressure. Fisheries New Zealand’s concern with such a scheme is that it could create confusion among recreational shellfish harvesters and would likely require a substantial outreach and education campaign to implement successfully. This would be resource intensive.

661. A camera monitoring program for Cockle Bay is infeasible. The dispersed nature of cockle harvesting means that many cameras would be required to monitor the beach, and the costs of camera installation and footage review would be unjustifiable given the value of this small, amateur fishery. It would also likely result in requests for similar programs at other beaches, which Fisheries New Zealand lacks the resources to accommodate.

662. A shortened open season may be worth considering in a future review, once the beds are in an acceptable condition for harvest.

663. A number of submitters referenced observed increases in mud patches at Cockle Bay, hypothesising that the increase in soft mud may be due to the removal of cockles and shell by harvesters. Several submitters suggested that, following the closure, FNZ should allow harvesters to take the cockle meat only and require them to return the shells to the cockle bed.

664. FNZ considers this would likely present a food safety concern. However, a community shell recycling program may fulfil a similar function and could be considered. Such a program would need to be developed in consultation with Biosecurity NZ.

7 Other considerations

Sediment Inputs

665. A submission from Fiona Rankin identified the influx of terrigenous sediment to the intertidal zone as a likely cause of cockle decline. She referred to several research papers that have demonstrated the impacts of increased sedimentation on intertidal shellfish species including cockles. The fine particles in terrigenous sediment can reduce the feeding efficiency of filter feeders like cockles, forcing the cockles to expend more energy on feeding and less on growth and reproduction. Fiona also noted that a closure would allow time to understand any changes that are occurring to the substrate in Cockle Bay and how these may or may not be affecting the sustainability of the cockle bed.

666. Janet Dickson likewise shared concerns about sediment inputs, citing poor building practices, inadequate stormwater and sewage infrastructure, and dredging at Pine Harbour as likely sources of sediment at Cockle Bay/Tuwakamana. She suggested improved supervision of dredging at Pine Harbour and better monitoring and enforcement at building sites.

667. The impact of increased terrigenous sediment inputs on the marine environment is of great concern to Fisheries New Zealand. While managing erosion and sediment control are beyond the scope of Fisheries New Zealand's responsibilities, it is incumbent on Fisheries New Zealand to work with responsible agencies to ensure that the effects of water quality on the sustainability of fisheries resources are considered during decision-making.

The Use of Tools

668. Two submitters also recommended that Fisheries New Zealand reconsider the definition of "hand-gathering" as stated in the Amateur Fisheries Regulations and ban the use of tools to harvest cockles. The RFC states that metal tools currently used for cockle gathering should be banned because they pose a mortality risk to juvenile cockles and spat.

669. There is currently no ban on using tools such as picks, spades, and shovels to aid hand-gathering of cockles. Compliance has confirmed that cockle harvesters do occasionally use such implements as harvesting aids. FNZ will consider the proposal outside of this consultation process.

A Broader Management Strategy

670. A beach closure is intended to remove one pressure that could be at least partially responsible for the decline in large cockle abundance at Cockle Bay/Tuwakamana, but it is not a management strategy. The Howick Local Board has expressed support for Fisheries New Zealand's intention to explore management strategies in order to provide for more consistent sustainable utilisation of intertidal shellfish at Cockle Bay and would like ongoing engagement with FNZ to develop these strategies.

671. Noting that pressure on the intertidal zone is a widespread challenge, the Auckland Conservation Board submission stressed the inefficiency of addressing the issue on a beach-by-beach basis and stated that it would value the opportunity to work with FNZ on a more coherent approach to managing the impacts of harvesting on shellfish populations.

8 Conclusions and recommendations

672. Fisheries New Zealand recommends that you revoke the existing seasonal closure at Cockle Bay/Tuwakamana and replace it with a full year-round closure to the recreational taking of intertidal shellfish as a sustainability measure under section 11 of the Fisheries Act 1996, as proposed in Option 2.

673. Closing the Cockle Bay/Tuwakamana to the recreational harvesting of intertidal shellfish year-round will remove one anthropogenic pressure that is likely contributing to the decline in the number of large cockles.

674. Fisheries New Zealand intends to review the closure after a period of three years to determine whether it has worked as intended and to ascertain whether the beach might be reopened for recreational intertidal shellfish harvest. If the review suggests that the beach could be reopened and support a sustainable level of harvest, the Minister would be provided with advice in order to make a decision on revoking the full closure and what ongoing management options are available, for example reinstating a seasonal closure.

9 Decision for proposed s11 closure to the taking of intertidal shellfish at Cockle Bay/Tuwakamana

Option 1

Agree to take no action. The current management regime will remain in place.

~~**Agreed / Agreed as Amended / Not Agreed**~~

OR

Option 2 *(Fisheries New Zealand preferred option)*

Agree to sign a *Gazette* notice revoking the existing seasonal closure at Cockle Bay/Tuwakamana and replacing it with a full, year-round closure to the recreational harvest of intertidal shellfish as a sustainability measure under s11 of the Act.

Agreed / ~~Agreed as Amended / Not Agreed~~

Hon David Parker
Minister for Oceans and Fisheries

5 / 3 / 2021