Fisheries New Zealand
Tini a Tangaroa

Review of Sustainability Measures for Snapper (SNA 7) and Red Gurnard (GUR 7) for 2020/21

Fisheries New Zealand Discussion Paper No: 2020/11

ISBN No: 978-1-99-002517-4 (online)
ISSN No: 2624-0165 (online)

May 2020

New Zealand Government

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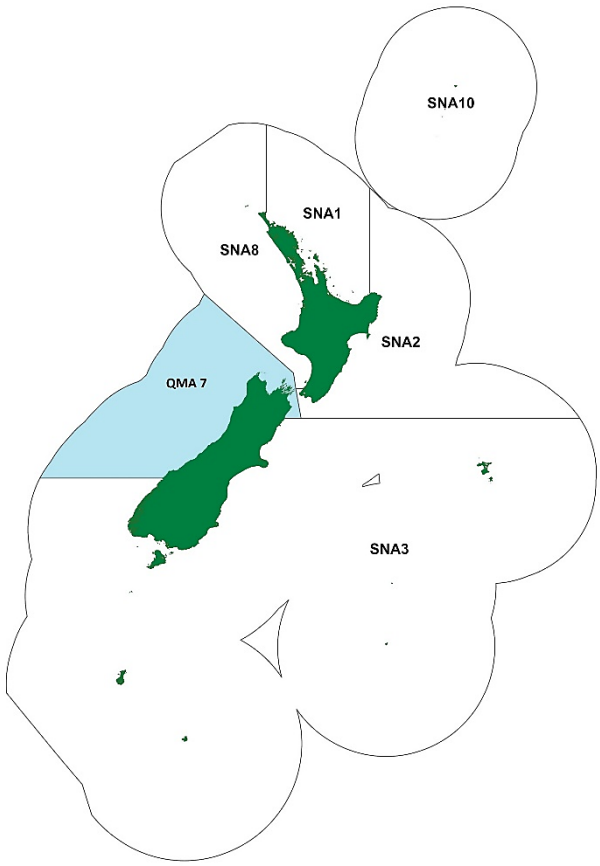

Figure 1: Quota Management Area (QMA) 7 (Challenger/Central (Plateau) for snapper and red gurnard.

2 Summary

1. Fisheries New Zealand is proposing to review the sustainability measures for snapper in SNA 7 and red gurnard in GUR 7 for the 1 October 2020 fishing year.

2. This review is Part 2 of the Top of the South mixed trawl review, which saw the Total Allowable Catch (TAC) for red gurnard, rig, and John dory increased by 10%, and a TAC set for elephant fish, last year.

SNA 7

3. Best available scientific information suggests the SNA 7 stock is at or about the target biomass. Forward projections suggest that SNA 7 biomass will continue to increase and more snapper could be taken. However, there is uncertainty associated with the stock status and forward projections arising from the strength of a potentially-strong 2017 year class.

4. Given the importance of the SNA 7 fishery to customary, recreational and commercial fishers, Fisheries New Zealand convened a series of workshops between October 2019 and March 2020 inviting all sectors to participate and contribute to the development of management options for snapper as part of this review. Participants noted that the stock has rebuilt from the historically low levels of biomass in the early 2000s and considered that an increase in the TAC and Total Allowable Commercial Catch (TACC) would be sustainable and provide benefits in terms of the overall value of the fishery. They also discussed the overestimated preliminary recreational estimates that informed the recreational catch allowance set in 2016, which resulted in this allowance being set above the likely recreational catch at that time.

5. Based on these discussions and available scientific information, Fisheries New Zealand proposes three TAC options for consultation. All options are within the range of sustainable yield estimates from the 2020 stock assessment (550 - 700 tonnes) and have varying probabilities of maintaining the stock at or above the target biomass depending on the strength of the 2017 year class. The choice of TAC options differs in terms of the weight fisheries managers placed on the uncertainty associated with the stock status and yield estimates, and also how they deal with the recreational allowance.

   Option 1 is to maintain the status quo. This is a cautious option that places weight on the uncertainty associated with the scientific assessment. It retains the TAC at 545 tonnes, the TACC at 250 tonnes and all allowances as currently set (customary, 20 tonnes; recreational 250 tonnes; other sources of fishing related mortality (OSFRM) 25 tonnes). It retains the current recreational allowance at 250 tonnes on the basis that recreational catch appears to be increasing in parallel with increasing snapper abundance and that this recreational allowance may now be appropriate.

   Option 2 retains the TAC at 545 tonnes, however, within this TAC it increases the TACC by 50 tonnes to 300 tonnes and reduces the recreational allowance by 50 tonnes to 200 tonnes (slightly more than the most recent recreational catch estimate in 2017). Note that this lower recreational allowance would not constrain utilisation of the recreational fishery (i.e. no changes to snapper bag limits are proposed).

   Option 3 is the workshop developed option and increases both the TAC and the TACC by 100 tonnes to 645 tonnes and 350 tonnes respectively, and retains the current allowances.

6. Option 3 was workshop participants' preferred option. Participants considered the abundance of snapper is increasing rapidly. This view was based on data from the most recent *RV Kaharoa* trawl survey and observations from experienced fishers noting a further strong cohort of juvenile snapper. Under these circumstances Option 3 remains within the sustainable yield estimates and would assist fishers to obtain value across the Top of the South trawl fishery, while also setting an allowance for recreational fishing that reflects the increased availability of snapper and likely catches over the next few years. However, given the uncertainty of the strength of the 2017 year class this option also carries the greater degree of sustainability risk.

GUR 7

7. As a continuation of the multispecies approach initiated last year we have also analysed catch trends for other stocks in the Top of the South mixed trawl fishery. Commercial catch data for the year to-date indicates that red gurnard catch continues to track above previous catch trends (with red gurnard catch exceeding the TACC in 2019). Catch trends for other stocks in this mixed trawl fishery do not. While we do not have new trawl survey indices for assessment, we note that the stock status for red gurnard is very likely to be at or above the target (based on the 2019 biomass index). The interdependencies between snapper and red gurnard suggest any increase in the snapper TACC could result in more red gurnard be taken.

8. Fisheries New Zealand proposes two options for red gurnard for consultation.

   Option 1 is the status quo and retains the TAC at 1,176 tonnes, the TACC at 1,073 tonnes, the customary allowance at 15 tonnes, recreational allowance at 38 tonnes and OSFRM at 50 tonnes.

Option 2 proposes to increase TAC to 1,283 tonnes and TACC by 107 tonnes to 1,180 tonnes and retains all current allowances.

9. The proposed TACC increases for snapper and red gurnard could potentially result in additional commercial fishing effort in these fisheries. While trawling has an impact on the environment, there are a number of regulatory and voluntary closures in place to reduce the impact of trawling on certain areas within QMA 7 such as the Separation Point bryozoan beds and juvenile fish habitat. In addition, commercial fishers in these fisheries are using lighter gear, fishing further offshore, and the size of the fishing fleet has also reduced significantly over the last twenty years. These closures and changes to fishing practices are likely to mitigate the impacts of additional fishing effort on the existing modified environment.

10. Fisheries New Zealand seeks your input and views on the options proposed for SNA 7 and GUR 7.

3 Quota Management System

11. Snapper and red gurnard are managed in New Zealand's exclusive economic zone using the Quota Management System (QMS), with a 1 October to 30 September fishing year. For more information about the QMS go to https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/.

3.1 History of previous SNA 7 TAC and TACC settings

12. SNA 7 TAC and/or TACC management settings were previously reviewed in 1990, 1997, 2013 and 2016. Historical catch data indicated the initial biomass of SNA 7 was large, but this was based on a 1986-88 tag estimate of abundance. Based on low catches the stock was assumed to have collapsed by the mid-1980s until it started to rapidly rebuild in 2009. A timeline of reviews and decisions is provided below.

Table 1: Timeline of previous SNA 7 TAC and/or TACC management settings.

Review year	TAC (tonnes)	TACC (tonnes)	Customary (tonnes)	Recreational (tonnes)	OSFRM (tonnes)	Rationale
1986- June 1990		374				TACC managed fishery
July 1990		160				To reflect low CPUE
1997	306	200	16	90		Introduced to QMS
2013	306	200	16	90		Industry requested an increase, however the then Minister for Fisheries decided to retain the status quo until more information regarding the CPUE increase could be collected and the status of the stock better understood.
2016	545	250	20	250[1]	20	The decisions provided for increased recreational catch and value, and allowed an increase in commercial fishing to reflect increased abundance. Customary allowance was increased to reflect fishing success from abundance. OSFRM was increased to 10% of TACC.

[1] The 2016 decision for recreational allowances was based on preliminary estimates of a recreational catch of 306 tonnes from a survey that was underway at the time but not complete. In 2017, the survey was completed and analysed, and the final estimate of recreational catch of 83 tonnes in 2015/16 was much lower than the preliminary estimate. However, the most recent analysis (in April 2020) suggests that 83 tonnes may underestimate the catch in 2015/16 by about 13%. This would make the catch in that year slightly higher than the estimate from the National Panel Survey of Marine Recreational Fishers (2011/12) rather than slightly lower.

4 Legal basis for managing fisheries in New Zealand

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

5 Treaty of Waitangi Obligations

5.1 Input and participation of tangata whenua

14. Iwi Fisheries Forums and Forum Fisheries Plans provide for input and participation of tangata whenua. Te Waka a Māui me Ōna Toka Iwi Forum (the 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.

15. In August 2019, Fisheries New Zealand informed the forum that Industry had agreed to fund a stock assessment update of SNA 7 and of our intent to undertake a multi-sector engagement approach to a 2020 SNA 7 review. Ngāti Apa ki Ratō responded indicating a particular interest in how Fisheries New Zealand would address recreational allowances in light of the overestimated 2016 preliminary recreational estimates used as the basis for setting the recreational allowance in 2016. Te Ohu Kaimoana (who represent 58 Iwi Organisations nationwide) also strongly advocated for a review of the 2016 decision to occur. Some forum members also noted their concern that the previous decision in 2016 to increase the SNA 7 TACC had resulted in changes to iwi quota shares due to the allocation of s28N rights.

16. In November 2019, we provided an update to the forum on the first stakeholder workshop and confirmed with the forum that its preference for input and participation for the review of snapper was through the iwi forum process.

17. Prior to a proposed March 2020 iwi forum hui, Fisheries New Zealand provided forum members with fisheries management material for discussion, including an update on the SNA 7 stock assessment results, a summary of the outcomes of the series of stakeholder workshops (including proposed recreational and commercial settings) and sought information on whether the customary allowance remained appropriate. Red gurnard had been discussed with the forum in 2019 as Part 1 of the review. However, due to COVID-related travel restrictions the intended hui on 18 March 2020 was cancelled and input and participation from the forum has been impacted. Any further input from the nine tangata whenua Iwi of Te Wai Pounamu will be by electronic means and will be included in the final advice and recommendations provided to the Minister. Input provided may result in alternative options being presented to the Minister for his decision on the management settings for snapper and/or red gurnard.

5.2 Kaitiakitanga

18. 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.

19. Snapper and red gurnard 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 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.

20. The following customary management areas are located within SNA 7:

    - the taiāpure of Whakapuaka (Delaware Bay)

    - the mātaitai reserves of Okuru/Mussel Point, Tauperikaka, Mahitahi/Bruce Bay, Manakaiaua/Hunts Beach, Okarito Lagoon, Te Tai Tapu (Anatori), Te Tai Tapu (Kaihoka).

6 SNA 7 Workshops

21. Given the importance of snapper to customary, recreational and commercial fishers. Fisheries New Zealand held a series of workshops from October 2019 through to March 2020 inviting all sectors to participate and contribute to the development of management options. Invitees consisted of representatives or individuals with associated expertise from Iwi, commercial, recreational and environmental sectors.

22. Option 3 presented in this paper was developed as a result of these workshops, and is participant's preferred option. Participants consider this option will be sustainable and provide benefits in terms of overall value across the Top of the South trawl fishery. Participants considered this option provides an allowance for recreational fishing that reflects the increased availability of snapper and likely catches over the next few years. However this preference is subject to the following caveats:

    - It is 'in principle', with each sector and/or individual being entitled to submit, or respond, to the consultation document after further discussions within their sector or networks.

    - There would be an ongoing commitment to hold another workshop(s) to monitor the fishery. Monitoring could include accessing geospatial positioning data to monitor changes in commercial fishing behaviour, new trawl survey information, and compliance reports (recreational and commercial). Participants also expressed an interest in continuing to work together to explore innovative management opportunities for a rebuilt fishery.

    - Participants would continue to test if the recreational fishing regulations are appropriate to support responsible fishing practices (eg, the group was supportive of "fishing for the fridge" not "fishing for the freezer").

7 Relevant plans, strategies, statements and context

23. Fisheries New Zealand's draft National Inshore Finfish Fisheries Plan (2019) provides guidance on management objectives and strategies for New Zealand's inshore finfish fisheries. The draft Plan outlines Fisheries New Zealand's high-level direction and overarching framework for managing inshore fisheries for the next five years. The five key focus areas of the Plan are: managing individual stocks, enhancing benefits for customary, commercial and recreational fisheries, enabling integrated multi-stock management, improving local fisheries, and improving environmental performance. The two-part Top of the South mixed trawl review has been a step towards these objectives. Public consultation on the draft plan closed 19 February 2020. Thirty-nine submissions ranging across a number of themes were received, which Fisheries New Zealand is currently considering.

24. There are a number of regional plans in place within QMA 7, including:

- Regional coastal plans to address the cumulative effects of activities in the coastal marine area, and the adverse impacts from land-based activities on the marine environment.

- The Marlborough Environment Plan (MEP) sets out provisions relating to the disturbance of the seabed in Ecologically Significant Marine Sites. The proposed MEP contains a rule stating '*Disturbance of the seabed must not occur within a Category A Ecologically Significant Marine Site*'. It prohibits dredging and bottom trawling within any Category A or B Ecologically Significant Marine Site but allows for these fishing methods to be discretionary activities within the buffer zone of these sites. On 21 February 2020, the MEP Hearing Panel announced its decisions on the MEP. These decisions are now subject to appeals to the Environment Court.

25. Fishers are subject to the rules in the plans (for example, small scale restrictions on fishing methods), however, the large area of QMA 7 means these rules do not, in general, stop fishers taking their annual catch entitlement (ACE) from other areas within this QMA.

8 Part 1 of the review and implications for other stocks within the mixed trawl fishery

26. This review is Part 2 of the Top of the South mixed trawl review, which saw the TAC for red gurnard, rig, and John dory increased by 10%, and a TAC set for elephant fish, last year. As a continuation of this multispecies approach catch trends for red gurnard, rig, John dory and elephant fish were analysed for the last full fishing year and this fishing year (to-date). Information suggests that more red gurnard are being taken than previously for the same period for the last five years. Catch for other stocks in this fishery do not show this same trend.

27. While there are no new trawl survey indices for assessment, we note that the stock status for red gurnard is very likely to be at or above the target (based on the 2019 biomass indices, noting the important point that this does not take into account last year's TAC increase). Furthermore, red gurnard commercial catch exceeded the TACC in 2019. Given the interdependencies between the snapper and red gurnard fisheries, any increase in the snapper TACC is likely to result in more red gurnard be taken.

28. A recent assessment (2020) indicates the TACC for flatfish (FLA 7; a key component in the mixed trawl fishery) is higher than current catch and abundance, with one of the seven species (English sole on the west coast) potentially declining. Feedback from stakeholders and analysis of commercial catch in Part 1 of the multispecies review indicates a strong interdependency between the snapper and flatfish in the Top of South. Fisheries New Zealand will be monitoring any changes in FLA 7 catch in response to any TACC increase for snapper and gurnard to inform a future review of sustainability measures.

9 Current state of the stocks

9.1 SNA 7

29. In the most recent stock assessment update, the base model estimates the stock status of SNA 7 to be at about the interim target biomass of 40% SB_0 (40-60% probability). The stock status is also referenced against the associated soft limit of 20% (which triggers a formal time-constrained rebuilding plan) and hard limit of 10% (where a closure of the fishery should be considered). The stock assessment estimates biomass has increased considerably since 2010 and is well above the soft limit (figure 2).

30. During the stock assessment estimates of current and equilibrium yield were derived for the stock based on the fishing mortality rate that corresponds to the interim target biomass level. Equilibrium yields at the interim target biomass level (40% SB_0) are estimated to be about 550-700 tonnes per year. Equilibrium yield is essentially the amount of harvest that the population can sustain and the stock remain at target; however, interpretation of this quantity needs to be tempered by the fact that this stock is still rebuilding and is far from an equilibrium state. The stock status and yield estimates are subject to uncertainties

associated with the strength of recent recruitment, including a potentially-strong year class in 2017 that was captured in the 2019 trawl survey.

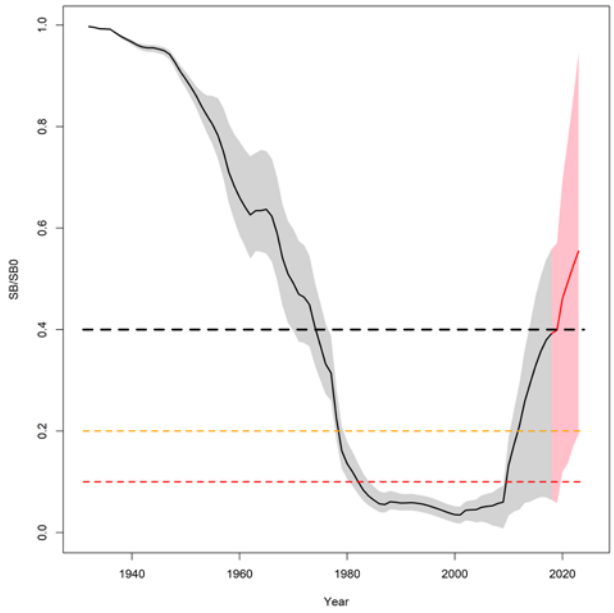

Figure 2: Annual trend in spawning biomass relative to the interim target biomass (40% SB_0) for the base model, including the estimation of recruitment for the 2017 year class. The solid black line represents the median and the shaded area represents the 95% confidence interval. The projection period (2019-2024) is the solid red line, black dashed line is the interim target, orange dashed line is the soft limit and the red dashed line is the hard limit. A Langley, pers comm.

31. Given the uncertainties associated with the strength of recent recruitment, additional model sensitivities were conducted to investigate the influence of key assumptions in the estimation of stock status. The Recruit2016 model was run that excludes the exceptionally strong year class (2017) captured in the 2019 trawl survey (core + SNA) and assumes instead that it is of average size (figure 2a). The exclusion of the strong 2017 year class (figure 3) results in a lower estimate of future stock status.

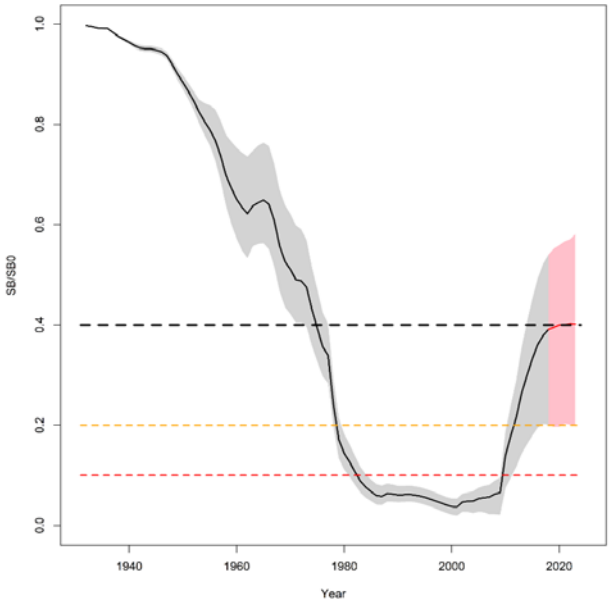

Figure 2a: Annual trend in spawning biomass relative to the interim target biomass (40% SB_0) for the Recruit2016 model, assuming average recruitment for the 2017 year class. The solid black line represents the median and the shaded area represents the 95% confidence interval. The projection period (2019-2024) is the solid red line, black dashed line is the interim target, orange dashed line is the soft limit and the red dashed line is the hard limit. A Langley, pers comm.

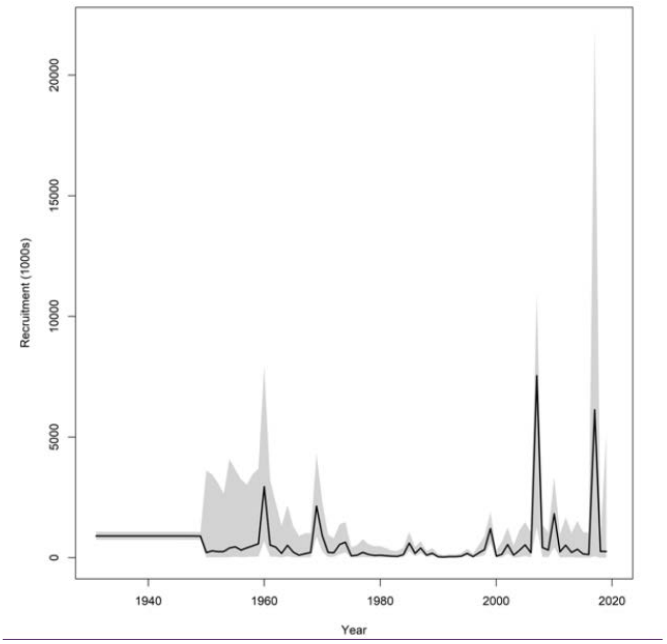

Figure 3: Estimates of annual recruitment (numbers of fish) from the base assessment model. The line represents the median of the Markov chain Monte Carlo (McMC) samples and the shaded area represents the 95% confidence interval (Langley, 2020).

32. Snapper stocks are characterised by variable recruitment with strong recruitment periods every 7-10 years. As snapper recruitment is known to be associated with warm water temperatures, it is possible that the number of years between strong recruitment could be reducing with increasing sea temperatures.

33. Fisheries scientists have identified that further work is required, generally, to determine whether warmer conditions, better recruitment and possibly better growth in New Zealand's snapper fisheries (although there is no indication of a change in growth rates in SNA 7) indicates a regime shift or a period of greater productivity for this species. If this is the case, the stock status may need to be reviewed to account for any productivity change in the future.

9.2 GUR 7

34. The stock status of red gurnard is estimated to be very likely (>90% probability) to be at or above target, based on the 2019 biomass indices (see figure 4). The proxy B_{MSY} target (relative biomass) for this fishery is 460 tonnes with a soft limit of 50% of the target and a hard limit of 25% of the target.

35. GUR 7 appears to be experiencing a recruitment pulse (consecutive years of good recruitment) as the 2015, 2017 and 2019 West Coast South Island (WCSI) trawl survey relative biomass indices have been the highest in the series. The Plenary regards the series as a reliable index of abundance. Although the 2019 index is lower than the 2015 and 2017 indices it is still above the long-term mean.

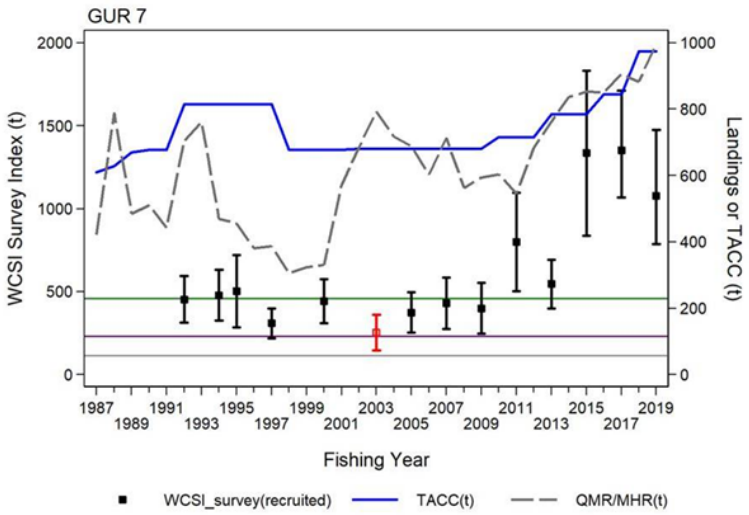

Figure 4: Comparison of GUR WCSI trawl survey indices with commercial landings (grey dashed line) and TACC (blue line) for GUR 7. The management target B_{MSY} proxy of 460 t (green line); the soft limit (purple line); the hard limit (grey line).

10 Recent catch levels and trends

36. Best available information suggest there is an increasing trend for both recreational and commercial catch for SNA 7 and GUR 7.

10.1 Customary

37. The current level of Māori customary catch for finfish in QMA 7 is uncertain. Snapper (*Tamure*, *Kouarea*) and red gurnard (*Kumukumu*) have been reported under the Fisheries (South Island Customary Fishing) Regulations 1999, in past years. However, there is no recent recorded customary catch for these species. 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.

10.2 Recreational

38. Recreational fishers advise the likelihood of catching snapper has seen greater participation in the Tasman and Golden Bays recreational fishery, resulting in increases in catch of other important recreational species such as red gurnard. The latest National Panel Survey of Marine Recreational Fishers (2017/18) results are consistent with this feedback.

Table 2: Summary of the National Panel Survey of Marine Recreational Fishers results from QMA 7 for snapper and red gurnard

Fish stock	2011/12 Estimated harvest (tonnes)	2017/18 Estimated harvest (tonnes)
SNA 7	89	147.41
GUR 7	12.48	37.59

39. The National Panel Survey of Marine Recreational Fishers is a snapshot of fishing activity over a fishing year, and it is not appropriate to draw robust conclusions around increases or reductions in recreational harvest solely from this information. Factors such as weather, wind, swell, water temperature and fuel prices all determine how much fishing occurs in any given year.

10.3 Commercial

40. Snapper and red gurnard, along with flatfish, are key fish stocks in the Top of the South mixed trawl fishery. Reports from commercial fishers for the last few years have been that the abundance of snapper is making it difficult for fishers to avoid snapper. To avoid snapper commercial fishers have modified headline heights, changed target species and fishing depths, and increased net mesh size over the last few years. The changes in fishing practices to avoid snapper are resulting in fishing effort being shifted to other fish stocks, and potentially constraining the catch of other target species.

11 Current management controls

Table 3: Current controls on commercial and recreational fisheries by stock

Fish stock	Commercial controls other than TACC	Recreational controls
SNA 7	Standard regulatory 100mm trawl mesh size Minimum fish length 25cm Tasman Bay voluntary trawl closure from 1 November to 30 April to protect juvenile snapper	***Outside of Marlborough Sounds*** Minimum fish length 25 cm Maximum daily limit (per fisher) 10 ***Within Marlborough Sounds*** Minimum fish length 25 cm Maximum daily limit (per fisher) 3 Set net bans apply
All	Numerous area and method restrictions, as set out in the Fisheries (Challenger Area Commercial Fishing) Regulations 1986 and Fisheries (Commercial Fishing) Regulations 2001, including: • Seasonal pair trawling and mesh size restrictions in Tasman Bay • Separation Point Bryozoan bed fishing restrictions • Nelson Harbour/Waimea Estuary trawl prohibition • Regulated use of Danish seine within 3Nm off the coastline	Unless otherwise stated, minimum net mesh size of 100 mm applies A combined maximum daily bag limit of 20 finfish (of any combination) listed on Fisheries New Zealand's website (https://www.fisheries.govt.nz/travel-and-recreation/fishing/fishing-rules/challenger-region-fishery-management-area/#twistie) Numerous methods and area restrictions apply as set out in the Fisheries (Amateur Fishing) Regulations 2013

41. Other management controls in QMA 7 include: Waiau Glacier Coast Marine Reserve, Punakaiki Marine Reserve, Kahurangi Marine Reserve, Westhaven (Te Tai Tapu) Marine Reserve, Tonga Island Marine Reserve and Horoirangi Marine Reserve which all prohibit the take of marine life, shells, rocks or driftwood.

42. Controls under other legislation (eg, Resource Management Act) include the prohibited or discretionary activities associated with the 78 Marlborough Ecologically Significant Marine Sites.

12 Options – Varying TAC, TACC and allowances

43. Table 4 below shows the proposed TAC, TACC and allowances for snapper and red gurnard. Feedback during consultation may result in intermediate or alternative options being presented in the final advice to the Minister of Fisheries for consideration.

Table 4: Current and proposed TACs, TACCs and allowances (all in tonnes) for snapper and red gurnard.

Stock	Option	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
				Customary **Māori**	Recreational	All other mortality caused by fishing
SNA 7	Option 1 *(Status quo)*	545	250	20	250	25
	Option 2	545	300↑ (20%)	20	200↓ (20%)	25
	Option 3 (working group preferred)	645 ↑	350 ↑ (40%)	20	250	25
GUR 7	Option 1 *(Status quo)*	1,176	1,073	15	38	50
	Option 2	1,283 ↑	1,180 ↑ (10%)	15	38	50

13 Analysis of options for varying the TAC, TACC and allowances

13.1 Options for varying TAC

44. The best available information suggests the base model stock status for snapper is at or about target (although there is uncertainty associated with the strength of the 2017 year class), the stock status for red gurnard (based on the 2019 biomass indices) is very likely to be at or above the target.

45. The most recent stock assessment suggests that stock abundance will continue to increase for snapper in SNA 7 under the current harvest level. All options for snapper provided in this paper are within the equilibrium yield estimates and have varying probabilities of maintaining the stock at or above the target biomass depending on the strength of the 2017 year class. The choice of proposed TAC options differs in terms of the weight placed on the uncertainty associated with these yield estimates and corresponding allowances set for each sector.

46. In particular, there is uncertainty with the magnitude of the strong 2017 year class within the model. To provide probabilities for future projections two recruitment scenarios were run. Scenario one (the base case) included the 2017 year class with the model reflecting uncertainty, while the in second scenario (Recruit2016 model) the current uncertain estimate of the 2017 year class was replaced with an estimate of the average size of SNA 7 year classes. For each scenario the model was run with the current TACC (250 tonnes) and option 3 proposed TACC (350 tonnes) — both scenarios include non-commercial catch. The base case suggests the probability of SNA 7 remaining at or above the target in 2024 is 91% at the current TACC and 89.6% at the proposed option 3 TACC. If, however, the 2017 year class is of average size the probabilities significantly reduce to 50.8% probability that SNA 7 will remain at target at the current TACC and 44.9% if the TACC is set at 350 tonnes.

47. The base case may or may not be an appropriate measure of future projections, due to the high degree of uncertainty associated with these projections and the importance of assumptions around the magnitude of the 2017 year class as demonstrated in the Recruit2016 model.

48. Workshop participants agreed, in principle, to Option 3 for snapper. Participants considered the abundance of snapper is increasing rapidly with evidence of a further strong cohort of juvenile snapper in the trawl survey and their own observations. Under these circumstances Option 3 would assist commercial fishers to obtain value across the Top of the South trawl fishery. However, it is important to note that the final stock assessment and projections were not available before the conclusion of the workshops.

49. Given the uncertainty in the stock status and forward projections, a further TAC option (Option 2) has been provided for consultation. This option retains the current TAC (but provides for a smaller increase in the TACC) in the interim, until the cohort of newly-recruiting fish identified in the trawl survey reach an optimal size, and the results of the updated stock assessment of SNA 7 (scheduled for 2021) are available to provide greater certainty about biomass trends and forward projections. It takes into account that the large cohort is estimated from a single survey, and is not yet appearing in the fishery (equally, however, the incoming 2017 year class could be larger than currently estimated).

50. Red gurnard is a higher productivity stock than snapper as they are shorter lived and have relatively high natural mortality. An appropriate management strategy for species such as red gurnard is to be responsive to fluctuations in stock biomass (for example, to increase catches at times of high stock biomass and reduce catches at times of low biomass). While we do not have new trawl survey indices for assessment, we note that the stock status for red gurnard is very likely to be at or above the target (although this is based on the 2019 biomass index and does not take into account last year's increase), and the biomass remains high for the trawl survey time series.

51. In March 2021, the next biennial trawl survey will be completed. Fisheries New Zealand will continue to monitor trawl survey indices and catch information for the management of this fishery, as well as SNA 7.

52. Options 2 and 3 for snapper and Option 2 for red gurnard would provide benefits in terms of the overall value of these fisheries and are consistent with the Te Waipounamu Iwi Forum Fisheries Plan management objectives. Particularly Objective 3, to support environmentally responsible, productive, sustainable and culturally appropriate commercial fisheries that create long term commercial benefits and economic development opportunities for South Island iwi. However, noting the limitations associated with receiving input from the iwi forums at this time, Fisheries New Zealand is seeking further input from tangata whenua to include in its final advice on the review of SNA 7 and GUR 7.

53. Fisheries New Zealand considers the proposals in this paper will not impact on, or be impacted by, the taiāpure of Whakapuaka (Delaware Bay), or the mātaitai reserves of Okuru/Mussel Point, Tauperikaka, Mahitahi/Bruce Bay, Manakaiaua/Hunts Beach, Okarito Lagoon, Te Tai Tapu (Anatori), and Te Tai Tapu (Kaihoka). Commercial fishing is prohibited in the mātaitai reserves and the taiāpure has no regulations restricting the harvest of snapper or red gurnard. Furthermore, the large area of QMA 7 in combination with spatial distribution of snapper increasing means that the TAC increases proposed can be taken from other areas within QMA 7 outside of these customary management areas.

13.2 Customary, recreational and other sources of fishing-related mortality allowances

54. When setting a TAC, the Act requires the Minister to allow for Māori customary non-commercial fishing interests, recreational fishing interests, and all other mortality to the stock caused by fishing.

Customary allowance

55. Fisheries New Zealand has no new information on customary take for snapper or red gurnard. Feedback from the Te Waka a Māui me Ōna Toka Iwi Forum, to-date, has not identified that changes are required to the allowance of 20 tonnes for SNA 7 and 15 tonnes for GUR 7 (noting that customary take for snapper was increased in 2016 and red gurnard was increased in 2017 to reflect best available information on customary take).

56. Further input from the nine tangata whenua Iwi of Te Wai Pounamu may result in an alternative option(s) being presented to the Minister for his decision on the management settings including customary allowance for snapper and red gurnard in QMAs 7.

Recreational allowance

57. In 2016 the recreational allowance for snapper was increased from 90 tonnes to 250 tonnes. The basis for this decision was a preliminary estimate of recreational catch that was completed in 2017 and resulted in

the estimate of recreational catch of 83 tonnes in 2015/16, which was much lower than the preliminary estimate of 306 tonnes. The most recent analysis (in April 2020) suggests that 83 tonnes may be an underestimate of catch at that time (by about 13%). Iwi, Te Ohu Kaimoana, and Industry have advocated for a review of the 2016 decision and for catch allocations to be reset accordingly.

58. During the SNA 7 workshops, recreational representatives preferred to retain the recreational allowance at 250 tonnes, advising the level of participation in the fishery continues to grow in response to catch success associated with the increased levels of snapper abundance.

59. The results of the most recent (2017/18) National Panel Survey of Marine Recreational Fishers estimated that recreational SNA 7 catch had increased to 149 tonnes (noting that the National Panel Survey of Marine Recreational Fishers is a snapshot of fishing activity over a fishing year and there may be some variability between years).

60. The stock assessment model for SNA 7 includes non-commercial catch and assumes continued growth based on a range of parameters including recreational catch estimates from (the 1987 tagging programme, and aerial and panel surveys, combined with the model's estimates of exploitation rates, and the snapper biomass each year) see figure 5.

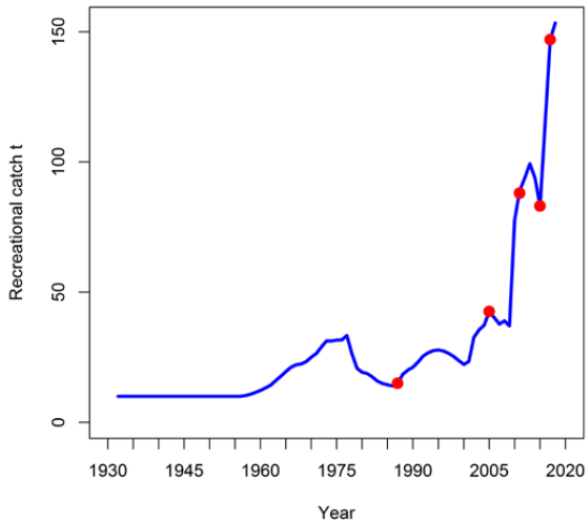

Figure 5: Annual recreational catch from SNA 7 included in the stock assessment model. The red point represent individual estimates of recreational catch for SNA 7 (Langley, 2020)

61. Additionally, results from a Fisheries New Zealand research project (MAF2014/04) indicate that recreational fishing effort for snapper in SNA 7 may have increased between 2017/18 and 2018/19 and the mean weight of individual fish caught increased by 12% between 2015/16 and 2017/18. In addition, landings under section 111 (recreational catch taken by commercial fishers) for SNA 7 for the 2018/19 fishing year was approximately 14,500kg.

62. Overall, based on the above information it is likely that recreational catch will have increased since the 2017/2018 National Panel Survey estimated it at 149 tonnes. All options for snapper take this into account to varying degrees.

63. Option 2, sets the SNA 7 allowance at a lower level than the current allowance (200 tonnes rather than 250 tonnes), but somewhat higher than the 2017/18 recreational survey estimate of 149 tonnes, recognising that recreational catch will have increased since that survey. It is important to note that this proposed reduced recreational allowance would not constrain utilisation of the recreational fishery (no changes to snapper bag limits are proposed). Options 1 and 3 retain the current SNA 7 allowance at

250 tonnes, on the basis that recreational catch is likely to have increased significantly since the 2017/18 survey was carried out.

64. The recreational allowance for red gurnard was increased by 50% in 2019 in Part 1 of the multi-species review and section 111 landings remain negligible. Therefore, Fisheries New Zealand considers this allowance is an accurate reflection of recreational take and is not proposing a change to the recreational allowance for red gurnard this year.

Other sources of fishing related mortality

65. OSFRM includes mortality associated with the requirement to return fish below the minimum legal size to sea and other mortality from fish escaping fishing gear, or illegal discarding. In 2019, the Minister indicated a preference for Fisheries New Zealand to move toward standardising OSFRM for inshore trawl fish stocks to 10% of their respective TACCs, unless we have information otherwise.

66. Fisheries New Zealand is not proposing to change the OSFRM allowance for snapper (currently 10% of the TACC) and red gurnard (currently set at 5% of the TACC) with the proposed increases to TACC. There have been significant changes in commercial fishing practices in QMA 7 including: use of larger mesh nets, lower headline heights, fishing in greater depths, and increased mesh sizes that suggest these existing allowances are appropriate. The recent SNA 7 stock assessment provides evidence that OSFRM in SNA 7 has declined steadily since 2006.

13.3 Options for varying the TACCs

67. Both Options 2 and 3 for snapper and Option 2 for red gurnard provide for an increase in their respective TACCs. The proposed 50 tonnes (Option 2) and 100 tonnes (Option 3) TACC increase for snapper, and 107 tonnes proposed TACC increase for red gurnard provide for greater economic benefits, and reflect the overall abundance and catch for these fish stocks (but also carry greater risks to both stocks).

68. Workshop participants noted the importance of commercial fishers maintaining current good fishing practices and continuing to look for ways to innovate and minimise impacts of fishing on the environment and other resource users. Currently approximately 80% of the snapper catch in SNA 7 is harvested in Tasman and Golden Bays by about nine vessels. With snapper distribution patterns extending further down the West Coast of the South Island catch spreading across the whole of SNA 7 will ensure fishing is not concentrated in the Bays. Fisheries New Zealand will work with Industry using the new geospatial tools and data now available in terms of catch spreading.

69. In Part 1 of the Top of the South mixed trawl fishery multi-species review (2019), analysed of the impact of changes to TACC's for the various species in the fishery and highlighted the interdependencies between snapper, red gurnard and flatfish, in particular that:

    - When targeting snapper, the typical bycatch mix (greatest to lowest proportion) is red gurnard, flatfish and rig

    - When targeting flatfish, the typical bycatch mix (greatest to lowest proportion) is red gurnard, snapper and John dory

    - When targeting red gurnard, the typical bycatch mix (greatest to lowest proportion) is snapper, John dory and rig.

70. The proposed increases in snapper TACC is likely to increase the catch of red gurnard and flatfish given the interdependencies between these three fish stocks. Flatfish has adequate headroom in its TACC to address any increase in catch as a result of an increase in snapper TACC. Analysis of the catch of red gurnard, rig and John dory for this fishing year to-date indicates, of these four species, that only red gurnard catch continues to track above previous catch trends.

71. In 2019, the TACC for GUR 7 was increased by 10%. New information on commercial catch shows that the TACC was over caught last year and that red gurnard catch for this year continues to track above previous catch trends at the same time period of the five last years. Furthermore, the interdependencies between snapper and red gurnard suggests that if the snapper TACC is increased more red gurnard could be caught, or alternatively the GUR 7 TACC could constrain snapper catch. Taking all these factors into account, fisheries managers consider a further small increase to the TACC for red gurnard could be appropriate in the short-term.

72. An assessment of the short-term value of the proposed increases TACCs, based on 2019/20 port prices, suggests the proposed increases of TACC for snapper of 50 tonnes and 100 tonnes will generate approximately $206,000 or $412,000 respectively, and the proposed increase in TACC (107 tonnes) for red gurnard approximately $233,000. It is important to note that 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.

14 Uncertainties and risk

73. The major sources of uncertainty associated with this assessment include:
    - SNA 7 stock status
    - Strength of the recent recruitment of the SNA 7 2017 year class
    - Historical commercial catches
    - Historical and projected levels of SNA 7 recreational catch
    - The accuracy of the GUR 7 2019 trawl survey indices, and the impact of last year's GUR 7 TACC increase.

15 Environmental interactions

74. Since 2013/14, over 80% of snapper catch in SNA 7 has been taken as bycatch from inshore trawl fisheries operating within FMA 7, particularly within Tasman and Golden Bays. Red gurnard is also primarily a bycatch species of target fisheries for different species including flatfish as well as snapper. However, some target fishing for red gurnard also occurs.

75. The proposed TACC increases for snapper and red gurnard could result in additional fishing effort in these fisheries. While trawling has an impact on the environment, there are a number of regulatory and voluntary closures in place to reduce the impact of trawling on certain areas within QMA 7 such as the Separation Point bryozoan beds and juvenile fish habitat. In addition, commercial fishers in these fisheries are using lighter gear, fishing further offshore, and the size of the fishing fleet has also reduced significantly over the last twenty years. These closures and changes to fishing practices are likely to mitigate the impacts of additional fishing effort on the environment.

76. When considering the impact of the proposed increases for snapper and red gurnard the environmental interactions described below are relevant.

15.1 Marine mammals

77. The risk of the proposed options increasing the adverse effects on marine mammals is considered low. Reporting conditions require vessel to report any incidental captures of marine mammals and appropriate action will be taken if such an event occurs.

78. The Maui and Hector's Dolphin Threat Management Plan (the plan) guides management approaches for addressing both non-fishing and fishing-related impacts on Maui and Hector's Dolphins. The plan includes a range of measures designed to reduce interaction with Hector's dolphins in the bottom trawl fisheries, and is currently being considered by the Minister of Fisheries and Minister for the Environment. Trawl risk is considered low enough to meet the population objective of the plan.

79. There have been two observed captures of New Zealand fur seals in trawls targeting snapper (nationwide) between 2002/03 and 2016/17 but low observer coverage of inshore trawlers make the frequency of interactions uncertain.

15.2 Seabirds

80. Tasman and Golden Bays are not areas of high abundance for at-risk ocean going seabirds that typically have interactions with trawl vessels and associated gear. Therefore, the risk of the proposed options increasing seabird interactions is considered low.

81. The number of observed captures of seabird (seven) and observed deck strikes (eleven) in trawls targeting snapper (nationwide) between 2002/03 and 2016/17 is considered low. Of the four threat classified seabird species, one black petrel was capture during this period. However, the frequency of these interactions is uncertain due to low observer coverage of inshore trawlers.

82. Seabird interactions with New Zealand's commercial fisheries are managed under the 2013 National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries (NPOA Seabirds). A revised NPOA Seabirds (2020) is expected to be released in coming months, following consultation earlier this year. The revised NPOA Seabirds, 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 our seabird populations.

15.3 Bycatch (fish and invertebrates)

83. Fish and invertebrate bycatch information in snapper target fisheries is primarily from trawl surveys. Trawl surveys targeting juvenile snapper in Tasman and Golden Bays have captured more than 50 finfish species including spiny dogfish, red cod, barracoota, tarakihi, hake and Jack Mackerel. Invertebrates captured included sponges, mussels, octopus and arrow squid.

15.4 Benthic impact

84. Research has characterised both New Zealand's benthic environment and the level of benthic impact from fisheries activity (Aquatic Environment and Biodiversity Annual Review, 2018). The environmental impacts of fishing are summarised annually by Fisheries New Zealand. Fisheries New Zealand will continue to monitor the bottom trawl footprint of fisheries. The SNA 7 workshop participants have identified future research could focus on developing a criteria for both identifying and managing habitats of significance in the region.

85. Tasman and Golden Bays have historically been intensively fished and are modified habitats. As mentioned the proposed TACC increases for snapper and red gurnard could result in additional targeted fishing effort in these fisheries.

16 Deemed values

86. Fisheries New Zealand is not proposing a change in the deemed values for red gurnard.

87. The current review of the management settings of snapper provides the opportunity for a review of the snapper deemed values regime. Deemed values function within the context of the other management

settings associated with the stock. Catches in excess of the available ACE do not necessarily indicate a problem with the deemed value rates of a stock. Rather, catches in excess of the available ACE (either at the level of the stock or the individual), can indicate that the other management settings of the stock require review.

88. Fisheries New Zealand considers a TAC review is the most appropriate management response given the observed increases in the abundance of snapper. Therefore, Fisheries New Zealand does not initially propose any changes to the deemed value rates of SNA 7. However, Fisheries New Zealand acknowledges that the appropriateness of the deemed value response depends on the level at which the TACC of snapper is set. If the TACC is set at a level where catches above this amount would result in a sustainability risk, then it would be necessary to have higher deemed value rates to tightly constrain catches without creating the incentive to misreport. A combined compliance and monitoring response would be required to ensure that the increased deemed value rates had the desired effect.

89. If the TACCs were set at an amount whereby some level of catches in excess of the available ACE would not risk sustainability, then high deemed value rates may not be appropriate. Decreases to the deemed value rates of SNA 7, would lessen the incentive to misreport and reduce the financial costs incurred by fishers for catching in excess of the available ACE in this case.

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

90. Fisheries New Zealand seeks your input and views on preferred options and the reasons for those. We are particularly interested in:

    - Which option do you support for revising the TAC, TACC and allowances for snapper in SNA 7? Why?
    - Which option do you support for revising the TAC and TACC for red gurnard in GUR 7? Why?
    - Do you support the deemed values regime for snapper to be reviewed, depending on the level at which the TACC of snapper is set? Why?
    - If you do not support any of the options listed, what alternative should be considered? Why?

91. Please provide detailed, verifiable information and rationale to support your views. If you are an organisation, please advise who you represent and/or your membership base.

92. Fisheries New Zealand also invites your initial views on whether any other changes to the management of the SNA 7 fishery should be considered in the future (eg, SNA 7 workshop participants suggested changes may be needed to support the approach of “fishing for the fridge” not “fishing for the freezer”).

18 Referenced reports

Aquatic Environment and Biodiversity Annual Review 2018 is accessible at https://www.mpi.govt.nz/dmsdocument/34854-aquatic-environment-and-biodiversity-annual-review-aebar-2018-a-summary-of-environmental-interactions-between-the-seafood-sector-and-the-aquatic-environment

Draft National Inshore Finfish Fisheries Plan (2019) is accessible at https://www.fisheries.govt.nz/news-and-resources/consultations/draft-national-inshore-finfish-fisheries-plan/

Fisheries (Amateur Fishing) Regulations 2013 is accessible at http://www.legislation.govt.nz/regulation/public/2013/0482/latest/DLM3629901.html?src=qs

Fisheries (Challenger Area Commercial Fishing) Regulations 1986 is accessible at http://www.legislation.govt.nz/regulation/public/1986/0218/latest/DLM107955.html?src=qs

Fisheries (Commercial Fishing) Regulations 2001 is accessible at http://www.legislation.govt.nz/regulation/public/2001/0253/latest/DLM76407.html?src=qs

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

Harvest Strategy Standard for New Zealand Fisheries, (2008) is accessible at https://fs.fish.govt.nz/Doc/16543/harveststrategyfinal.pdf.ashx

Langley, A.D; (2020). An update of the stock assessment of snapper in SNA 7. New Zealand Fisheries Assessment Report 2020/09 is accessible at https://www.mpi.govt.nz/dmsdocument/40283/direct

Quota Management System information is accessible at https://www.fisheries.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/

Stevenson, M.L; MacGibbon, D.J (2018). Inshore trawl survey of the west coast South Island and Tasman and Golden Bays, March-April 2017 (KAH1703). New Zealand Fisheries Assessment Report 2018/18 is accessible at https://fs.fish.govt.nz/Page.aspx?pk=113&dk=24603

Wynne-Jones, J.; Gray, A.; Heinemann, A.; Hill, L. (2014). *National Panel Survey of Marine Recreational Fishers 2011-2012. New Zealand Fisheries Assessment Report 2014/67.* 145p. is accessible at https://www.mpi.govt.nz/dmsdocument/4719-far-201467-national-panel-survey-of-marine-recreational-fishers-201112-harvest-estimates

Wynne-Jones, J.; Gray, A.; Heinemann, A.; Hill, L.; Walton, L. (2019). *National Panel Survey of Marine Recreational Fishers 2017-2018. New Zealand Fisheries Assessment Report 2019/24.* 104p. is accessible at https://www.mpi.govt.nz/dmsdocument/36792-far-201924-national-panel-survey-of-marine-recreational-fishers-201718

Stock status table for fish stocks (2018) https://www.mpi.govt.nz/dmsdocument/17653-stock-status-table-for-fish-stocks

19 How to get more information and have your say

93. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 1 July 2020.

94. Please see the Fisheries New Zealand sustainability consultation webpage (https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-october-2020/) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz.