Fisheries New Zealand
Tini a Tangaroa

# Review of Sustainability Measures for the FMA 7 mixed trawl fishery (Snapper - SNA 7, Red Gurnard - GUR 7 and Rig - SPO 7) for 2022/23

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# 1 Stocks being reviewed

**Snapper, red gurnard and rig** (SNA 7, GUR 7, SPO 7) – West Coast and top of the South Island

Snapper – *Pagrus auratus,*
Tamure, Kouarea

Red gurnard – *Chelidonichthys kumu,*
kumukumu, pūwhaiau

Rig – *Mustelus lenticulatus*,
pioke, makō, mango

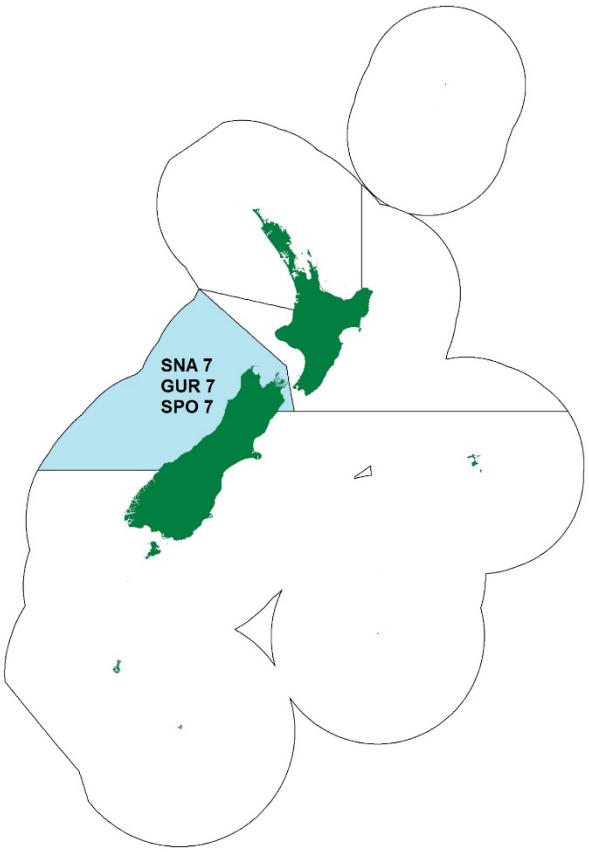


**Figure 1: Fisheries Management Area (FMA) for snapper (SNA 7), red gurnard (GUR 7) and rig (SPO 7).**

# 2 Summary

1. Fisheries New Zealand (FNZ) is reviewing sustainability measures for snapper, red gurnard and rig in Quota Management Areas (QMAs) SNA 7, GUR 7 and SPO 7 for the 1 October 2022 fishing year (Figure 1).

2. Recent stock assessments and other information suggests that there is an opportunity to provide for greater utilisation of SNA 7 and GUR 7. Rig is caught as associated bycatch in these fisheries, so an adjustment to management settings of SPO 7 may also be appropriate in line with changes to utilisation of those stocks. Fisheries New Zealand is proposing options to increase the Total Allowable Catches (TACs) and Total Allowable Commercial Catches (TACCs) of SNA 7 and GUR 7, and an option to adjust the TAC, allowances and TACC for SPO 7 in line with best available information on the fishery.

3. Based on best available information, and considering the interdependencies identified between these three stocks caught together in the Fisheries Management Area 7 (FMA 7) mixed trawl fishery, FNZ is proposing two options each for SNA 7, GUR 7 and SPO 7 as outlined in Table 1 below:

**Table 1: Proposed management options (in tonnes) for SNA 7, GUR 7 and SPO 7 from 1 October 2022.**

| Stock | Option | TAC | TACC | Allowances | | |
|---|---|---|---|---|---|---|
| | | | | Customary Māori | Recreational | All other mortality caused by fishing |
| **SNA 7** | **Option 1** *(Status quo)* | 645 | 350 | 20 | 250 | 25 |
| | **Option 2** | 743 ↑ (102 t) | 450 ↑ (100 t) | 20 | 250 | 23 ↓ (2 t) |
| **GUR 7** | **Option 1** *(Status quo)* | 1,422 | 1,298 | 17 | 42 | 65 |
| | **Option 2** | 1,582 ↑ (160 t) | 1,450 ↑ (152 t) | 17 | 42 | 73 ↑ (8 t) |
| **SPO 7** | **Option 1** *(Status quo)* | 373 | 298 | 15 | 33 | 27 |
| | **Option 2** | 371 ↓ (2 t) | 315 ↑ (17 t) | 15 | 25 ↓ (8 t) | 16 ↓ (11 t) |

4. FNZ welcomes your feedback and submissions on the options proposed, or any other alternatives.

# 3 About the stocks

5. Given the importance of the SNA 7 fishery to all sectors, FNZ brought fishing sector interests[1] together in the lead up to this sustainability measures review. All agreed that the state of the snapper fishery (and associated species) was positive, and that the snapper fishery rebuild is a success story — demonstrating how all sectors made concessions to achieve a common goal of a healthy, abundant fishery.

## 3.1 Fishery characteristics

6. Snapper, red gurnard and rig are species commonly caught together in the FMA 7 inshore mixed trawl fishery along with flatfish, tarakihi, and John dory. Trawling is the main commercial fishing method for these species in FMA 7. However, there is also some flatfish and rig target set netting, some commercial bottom longlining for snapper and Danish seine setting for flatfish and rig. Rod and line fishing is still the most preferred recreational fishing method in FMA 7, with some longlining and smaller amounts of other recreational methods (e.g., spear fishing).

### *Multi-species review approach*

7. In 2019, FNZ undertook a multi-species approach to reviewing those stocks caught together in the FMA 7 trawl fishery. At that time, analysis of the interdependencies between the stocks identified three groups of interdependencies (where target catch influences bycatch):

   - one with flatfish, snapper and red gurnard
   - the second with red gurnard, snapper and John dory
   - the third with rig and red gurnard.

8. FNZ continues to investigate new methods, with the help of the Sustainable Seas Challenge, to inform an appropriate pathway for managing stocks with different productivities and abundances caught together. This work includes mapping and modelling to inform an agent-base model and will continue to develop over time, through ongoing consultation and in different FMAs. For this review, the multi-species approach is focused on the increase in abundance of snapper and red gurnard and the interdependences associated with these stocks.

9. The snapper fishery in SNA 7 is centred on Tasman and Golden bays with catch increasing along the top of the west coast of the South Island as the distribution extends further south. Red gurnard is widespread throughout FMA 7.

[1] A SNA 7 management group was convened in 2020 comprising fisheries interests with knowledge in customary, recreational, commercial, and environmental sectors. Representatives met again in the lead-up to this review to share new information and discuss the proposed options for SNA 7.

10. Rig is a priority for review for industry due to its increasing CPUE and its interdependencies with snapper and red gurnard. Any changes to the management settings for snapper and red gurnard are likely to further increase bycatch interactions with rig. Several other stocks requested by industry for potential increased utilisation are not being reviewed at this stage due to their stock status or status relative to the overfishing threshold. FNZ will continue to work with industry on its priority stocks and identify information needs to reassess those stocks.

***Other stocks within the mixed trawl fishery not being reviewed***

11. Tarakihi, John dory and flatfish are also commonly caught in the FMA 7 mixed trawl fishery, however, these are not being reviewed this year. Tarakihi in TAR 7 has two discrete stocks; west coast South Island/Tasman Bay and the eastern Cook Strait. The eastern Cook Strait stock is considered part of the eastern tarakihi stock which is being reviewed this year in a separate sustainability paper. The west coast/Tasman Bay stock is associated with a different target catch mix (barracouta, red cod, stargazer and warehou).

12. John dory is mostly a bycatch species in red gurnard and flatfish target trawls. Its recent stock status assessment determined it is being managed appropriately (about as likely as not to be at the target, and at the overfishing threshold), and there is no new information to suggest an adjustment to the TAC, TACC or allowances is appropriate. However, given its interdependencies with red gurnard, consideration of the impact of the proposed options are discussed in this paper.

13. Flatfish in FLA 7 is also not being reviewed this year. Flatfish includes eight species within its generic species code, some with stock status information and some not. They have differing life spans and occur in localised populations across FLA 7 making managing them as a complex challenging. FNZ is considering management approaches for these species and will be engaging with iwi and stakeholders on a future management strategy once options are further developed. However, given the interdependencies of flatfish to both snapper and red gurnard, consideration of potential impacts from an increase to the TAC and TACCs of snapper and red gurnard on flatfish are included in this paper.

***Fishery changes since previous reviews***

14. In 2018 the inshore trawl fleet transitioned to electronic and geospatial position reporting of effort, catch and fishing location. This fine scale and real time data provides better temporal and spatial resolution of commercial fishing activity. While still too short a time series to indicate any changes in trends and/or behaviour it does give some insight into changes in fishing activities in response to changes in TAC and TACCs in subsequent years. It is important to note that COVID-19 has impacted the fishing industry over the past two years, as have increasing fuel prices. The following observations, therefore, may not reflect a typical operating environment.

15. Following the SPO 7 TACC increase in 2019, both SNA 7 and GUR 7 catch increased.

16. Following the SNA 7 and GUR 7 TACC increases in 2020, GUR 7 catch increased but dipped in the later months of the fishing year while SPO 7 catch significantly increased in those months. Overall, SNA 7 and SPO 7 catch was higher, and GUR 7 was slightly down from the previous year.

17. Since the GUR 7 increase in 2021, both SNA 7 and SPO 7 catch is tracking higher than the previous three fishing years (for the same time of year to-date) while GUR 7 is tracking slightly down from last year's catch.

18. Flatfish TACCs were originally set at high levels to provide fishers with the flexibility to take advantage of variable annual abundance. FLA 7 has had a constant high TACC since the late 1980s for this reason, with high fluctuations in catch since that time. However, catch for the past three full fishing years (2018-19 to 2020-21) has been relatively stable at low levels (ranging between 21% and 24% of the TACC).

19. Since the TACC increase for GUR 7 in 2020 to 1,180 tonnes, red gurnard was 97% caught in the 2020-21 fishing year. The TACC increase for SNA 7 in 2020 to 350 tonnes was 96% caught in 2020-21. In the 2020-21 fishing year rig was 95% caught.

## 3.2 Biology

### SNA 7

20. Snapper growth varies with region but snapper can reach a maximum of 105 cm and live to a maximum age of 60 years. They reach maturity at 3-4 years and 20-28 cm. Snapper in SNA 7 have the fastest growth rate of snapper in New Zealand. They are serial spawners and release numerous batches of eggs throughout spring and summer.

21. Snapper are found in central and northern areas of New Zealand to depths of 200 m. They are one of the most abundant and widely distributed inshore fishes in New Zealand. Snapper feed on a range on invertebrates including crabs, worms and shellfish.

### GUR 7

22. Red gurnard can grow to a maximum length of 55 cm with females growing faster and larger than males. They have a maximum age of 16 years and reach maturity at 23 cm in length and 2-3 years of age. Spawning occurs in spring-summer.

23. Red gurnard are found throughout New Zealand coastal waters at depths of 10-200 m. They feed on shellfish, crustaceans, and crabs.

### SPO 7

24. Rig females grow larger than males and can reach a maximum length of 150 cm, compared to a maximum length of 125 cm for males. They have an estimated maximum age of 20 years. They reach maturity at 85-100 cm length or 4-8 years depending on region. They have a gestation period of 10-11 months and give birth in spring-summer.

25. Rig are found throughout New Zealand waters. They can make extensive migrations and move into shallow areas to give birth before returning to waters up to depths of 400 m in autumn. Farewell Spit is a known nursery ground for rig in Tasman and Golden bays. Rig feed on a variety of benthic invertebrates, particularly crustaceans, echiurans and molluscs.

## 3.3 Management background

26. SNA 7 entered the QMS in 1986 as a TACC only fishery. Landings remained below the TACC after its introduction to the QMS and in 1989-90 the TACC was reduced to 160 tonnes (landings pre-QMS had been as high as 2,720 tonnes). A TAC and allowances were subsequently set in 1997. SNA 7's TAC was reviewed in 2016 and 2020 in response to increasing abundance as the fishery rebuilt from historically low levels.

27. GUR 7 entered the QMS in 1986 as a TACC only fishery. In 1997 a TAC was set and allowances followed in 2009. There have been six TAC reviews and changes to the TACC and allowances since, in response to increasing biomass trends. The most recent TAC review was completed last year (2021) in response to high abundance after several years of continuous good recruitment and to provide a utilisation opportunity for the commercial sector.

28. SPO 7 entered the QMS in 1986 and was a TACC only fishery until 2000 when a TAC and allowances where set. There have been four reviews of the TAC since, with the most recent in 2019 when the TAC and TACC were increased in response to increasing abundance.

29. For more information about the QMS go to https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/.

# 4 Status of the stocks

30. The best available information on the status of these stocks can be found within the May 2022 Fisheries Assessment Plenary (the Plenary).

31. Fish stocks within the QMS are managed to targets/reference points. When no stock specific target has been agreed, the Harvest Strategy Standard (HSS) and the associated Operational Guidelines provide default targets based on a stock's productivity. For example, snapper is

considered to be a low productivity stock because it has a low level of natural mortality and a high longevity – although these characteristics are offset to some extent by its relatively young age of maturity and high fecundity. As a low productivity stock, it has a management target of 40% $B_0$. As red gurnard is a more productive stock (e.g., with faster growth rates, high fecundity, high natural mortality and therefore a high turnover of generations) it has a management target of 35% $B_0$[2].

## SNA 7

32. In 2021 a new stock assessment was completed for SNA 7 which determined the stock is very likely (>90%) to be at or above the interim management target of 40% $B_0$ (see Figure 2). The stock status is also referenced against the HSS default 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). Overfishing is very unlikely (<10%) to be occurring (see Figure 3).

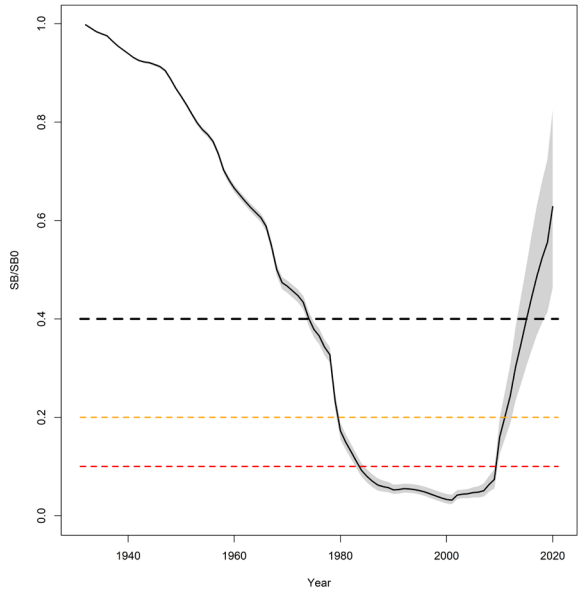


**Figure 2: Annual trend in spawning biomass relative to the 40% $B_0$ management target. The solid black line represents the median and the shaded area represents the 95% probability. The black dashed line represents the 40% $B_0$ management target. The red and orange dashed lines represent the hard and soft limits, respectively.**

[2] $B_0$: Virgin biomass, unfished biomass. This is the theoretical carrying capacity of the recruited or vulnerable or spawning biomass of a fish stock. In some cases, it refers to the average biomass of the stock in the years before fishing started. More generally, it is the average over recent years of the biomass that theoretically would have occurred if the stock had never been fished. B0 is often estimated from stock modelling and various percentages of it (e.g., 40%).

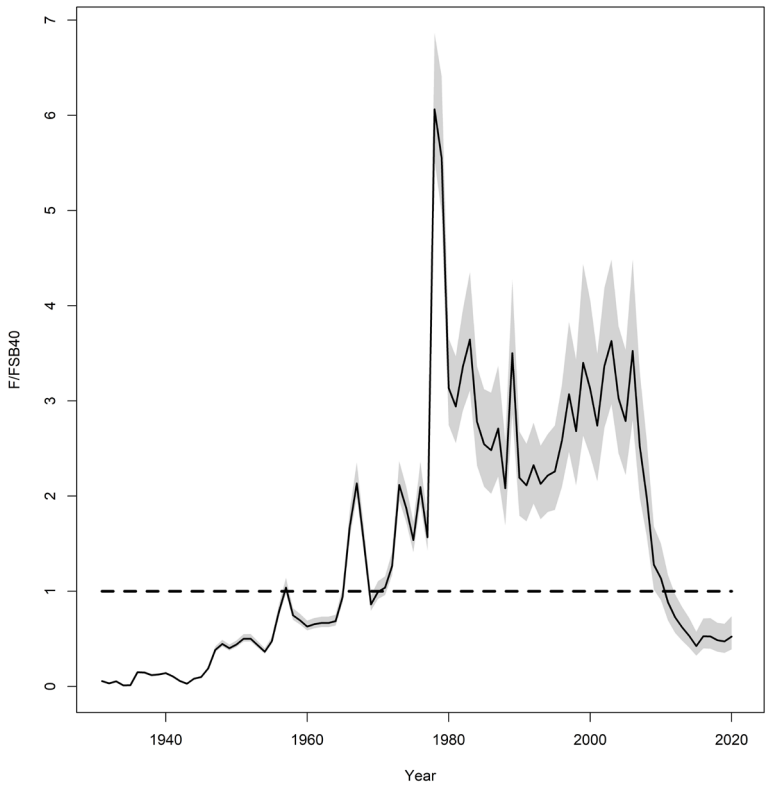


**Figure 3: Annual trend in fishing mortality relative to the management target. The line represents the median and the shaded area represents the 95% probability. The dashed line represents the management target level.**

33. Stock projections based on the long-term average recruitment, using both median and 25$^{th}$ percentiles, predict biomass will continue to increase at the level of the current TACC and increasing recreational catch. Figure 2 above shows that uncertainty in the biomass projections has increased in recent years due to the effect of West Coast South Island trawl survey biomass estimates for recruited snapper. These have shown large increases in relative abundance in the 2017- and 2018-year classes, which could result in overly optimistic stock projections. Therefore, a more precautionary metric was incorporated in the model (derived from the lower 25% quantile of the distribution of the projected stock biomass) to reflect a lower range of biomass and estimates of the recent recruits. Projections for both the base and more precautionary metric (lower 25$^{th}$ percentile) have been provided to support a range of projections.

## GUR 7

34. The first fully quantitative stock assessment of GUR 7 was completed in 2022. Previous partial quantitative assessments were based on the West Coast South Island Trawl survey series. The stock assessment was conducted using an age-structured population model. GUR 7 is virtually certain (>99%) to be at or above the default management target of 35% $B_0$ (Figure 4). The stock status is also referenced against the default Harvest Strategy Standard soft limit of 20% and hard limit of 10%. Overfishing is very unlikely (<10%) to be occurring (Figure 5).

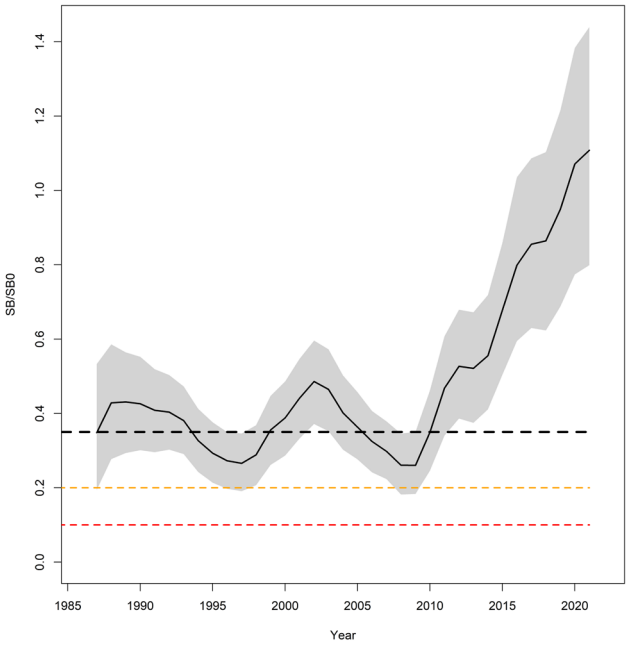


**Figure 4: Annual trend in spawning biomass relative to the 35% $B_0$ management target biomass. The black line represents the median and the shaded area represents the 95% probability. The dashed black line represents the management target. The red and orange dashed lines represent the hard and soft biomass limits, respectively.**

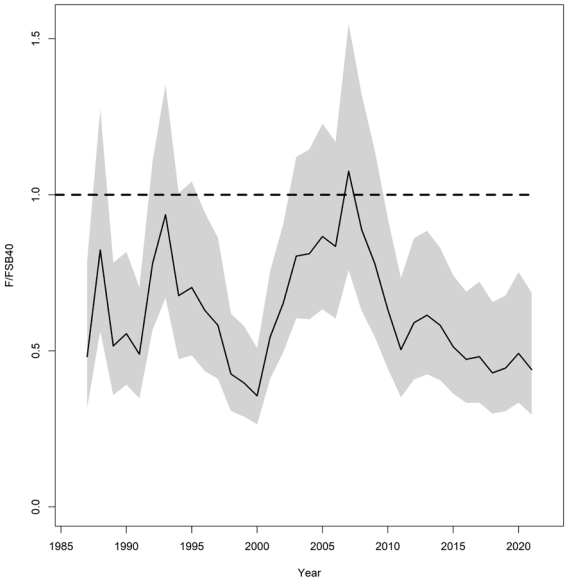


**Figure 5: Annual fishing mortality compared to the 40% interim threshold fishing mortality level (dashed line). Grey shaded area represents 95% probability.**

35. Stock projections suggest abundance is very likely to remain above the target biomass level over the next five years at current catch levels.

## SPO 7

36. A recent stock assessment (May 2022) based on the West Coast South Island trawl survey series and two standardised CPUE abundance indices has determined SPO 7 is about as likely as not (40-60%) to be at or above the proxy management target (Figure 6). Overfishing is also about as likely as not to be occurring.

37. Stock projections cannot be conducted based on current information, but the probability of the current catch or TACC causing overfishing to continue or to commence is unlikely (<40%).

38. There are some sources of uncertainty associated with the stock assessment including:

- The drop in the 2021 WCSI trawl survey index conflicts with the increasing trend seen in the two accepted CPUE series (bottom trawl (BT) and setnet (SN)).
- There is a lack of historical information on stock abundance during the 1970s-1980s when rig was heavily fished. Therefore, determining the stock status relative to early levels of abundance is difficult.
- The WCSI trawl survey and BT CPUE do not adequately sample large mature females (large rig tend to outswim BT gear).

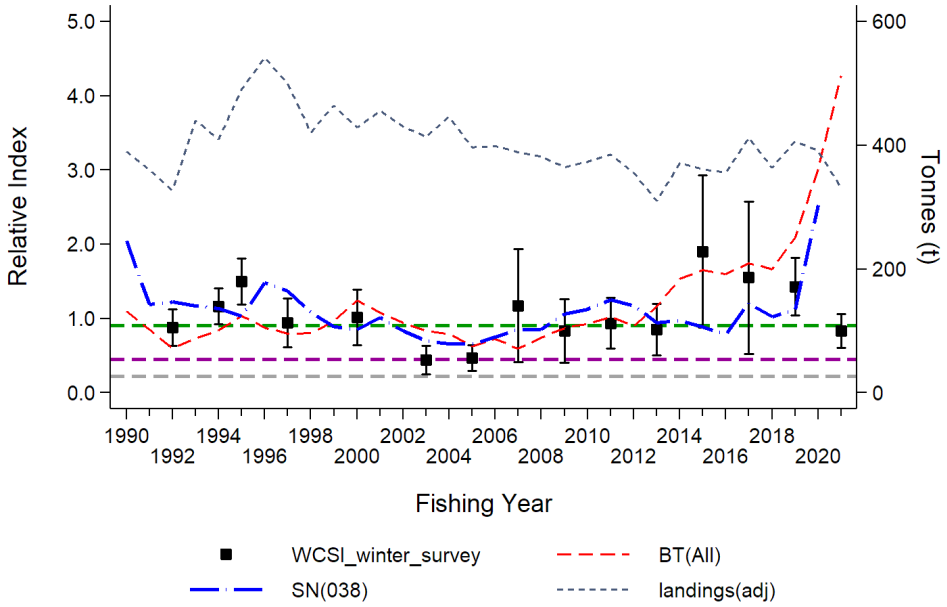


**Figure 6: Comparison of the West Coast South Island (WCSI) trawl survey and two accepted CPUE indices BT(All) and SN(038) with the adjusted reported landings for SPO 7. Adjustments were made to ensure that all catch values in every year are based on a common conversion factor. The agreed soft limit is the purple line, the management target is the green line, and the hard limit is the grey line.**

# 5 Catch information and current settings within the TAC

## 5.1 Commercial

### SNA 7

39. Commercial regulations set a minimum net mesh size for snapper of 100 mm and a minimum fish length of 25 cm.

40. Snapper fisheries are one of the largest and most valuable coastal fisheries in New Zealand. The commercial fisheries developed in the late 1800s and peaked in the 1970s following the introduction of pair trawling. With the introduction of the QMS, all snapper fishstocks were set at a level intended to allow for the stocks to rebuild.

41. Landings from SNA 7 remained below the TACC after introduction to the QMS, and in July 1990 the TACC was further reduced to 160 tonnes. In October 1997 the TACC for SNA 7 was increased to 200 tonnes within an overall TAC of 306 tonnes. In 2016, the TAC for SNA 7 was increased from 306 to 545 tonnes, including an increase in the TACC from 200 to 250 tonnes. The SNA 7 TACC was increased again in 2020 to 350 tonnes (Figure 7).

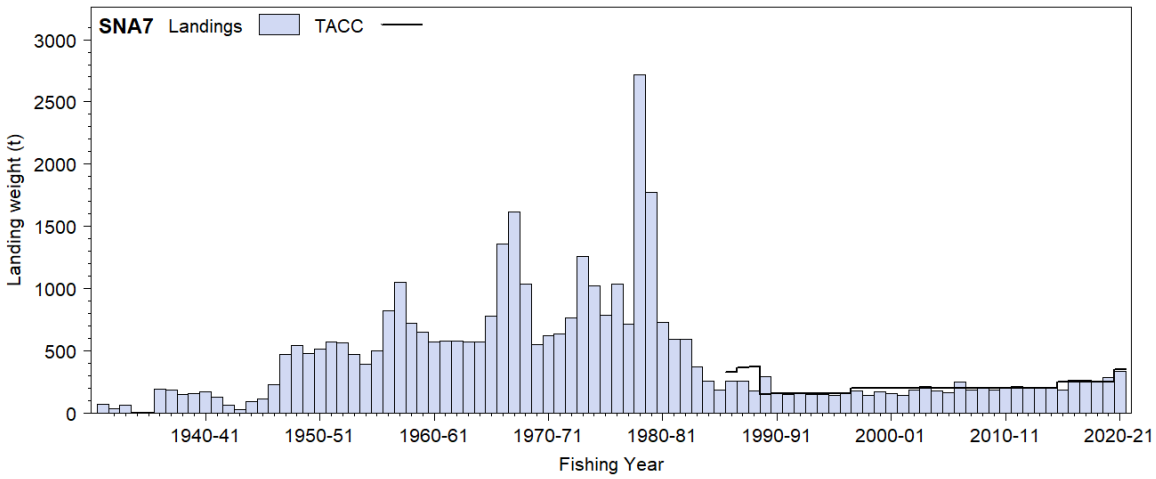


**Figure 7: Reported commercial landings (in tonnes) and TACC for SNA 7.**

42. Since 2016 commercial trawl fishers have progressively shifted to deeper water and there has been a simultaneous reduction in headline height of trawl gear to minimise snapper catch. The seasonal distribution of snapper catch has expanded from October through to May in the last decade. Previously most snapper catch was taken during October to January.

## GUR 7

43. Commercial regulations set the standard minimum net mesh size of 100 mm. There is no specified minimum fish length for red gurnard.

44. Red gurnard was introduced into the QMS in 1986. The 1986 TACC was based on 1983 landings for the region. Under the Adaptive Management Programme, which ended 30 September 2009, the TACC for GUR 7 was increased to 815 tonnes in 1991, and then was reduced to 678 tonnes in 1997, when a TAC and allowances were set for GUR 7. There have been numerous TACC incremental increases since (Figure 8).

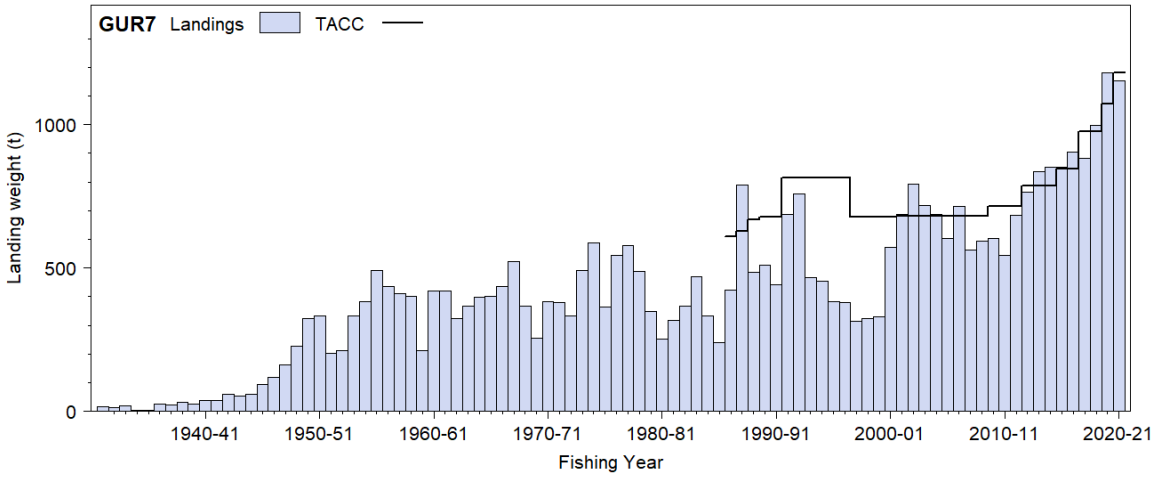


**Figure 8: Reported commercial landings (in tonnes) and TACC for GUR 7.**

## SPO 7

45. Commercial regulations set a minimum net mesh size for rig of 150 mm. There is no specified minimum fish length. Rig is a Schedule 6[3] stock and can be returned to sea if it is likely to survive. Schedule 6 returns have varied over the last five fishing years ranging between approximately 7 tonnes in 2016-17 to 21 tonnes in 2017-18. Last year approximately 10 tonnes of rig in SPO 7 was returned under Schedule 6.

46. Rig was introduced into the QMS in 1986 with a TACC for SPO 7 set at 294 tonnes until it was further increased in 1991 to 350 tonnes. A TAC was set in October 2000 which retained the TACC at 350 tonnes and set allowances for customary and recreational catch. In 2006 the TAC was reviewed and the TACC was decreased to 221 tonnes, and the other sources of mortality allowance was also set at this time. The decision to reduce the TACC was considered necessary to move the stock back to $B_{MSY}$[4] and was supported by an industry SPO 7 Fisheries Plan to implement voluntary closure to commercial set netting and trawling around Farewell Spit. Since 2006 the TACC for rig has been increased a further three times with the latest being in 2019 (Figure 9).

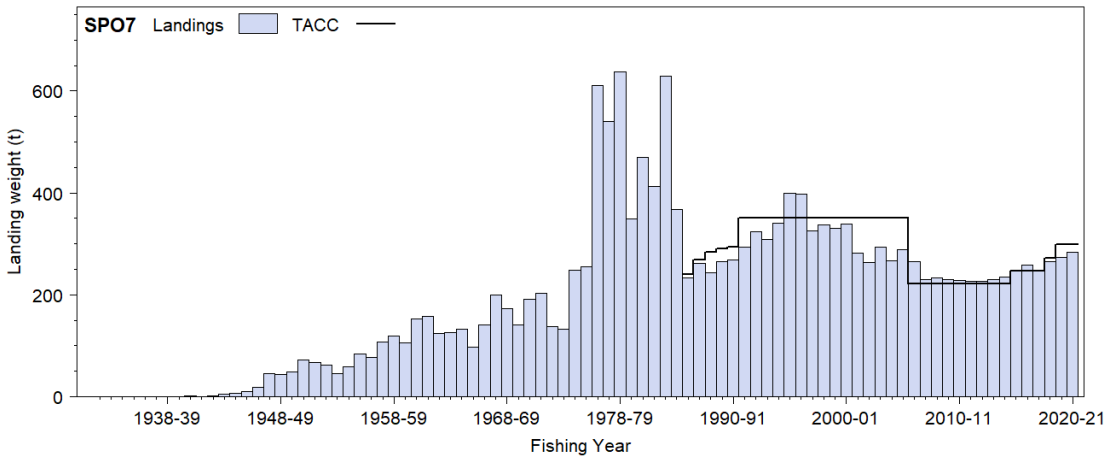


**Figure 9: Reported commercial landings (in tonnes) and TACC for SPO 7.**

## 5.2 Customary Māori

47. The current level of customary take for finfish in FMA 7 is uncertain. Under the Fisheries (South Island Customary Fishing) Regulations 1999, small amounts of tāmure (snapper), kumukumu (red gurnard) and mango (rig) have been reported as taken in FMA 7.

48. The small amount of customary reporting may reflect that tangata whenua are using recreational fishing regulations for their harvest. Also within FMA 7, 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.

49. The customary allowances for SNA 7, GUR 7 and SPO7 were last reviewed as follows:

- SNA 7: in 2016 the customary allowance was increased from 16 tonnes to 20 tonnes.
- GUR 7: in 2021 the customary allowance was increased from 15 tonnes to 17 tonnes.
- SPO 7: in 2006 the customary allowance was decreased from 24 tonnes to 15 tonnes.

[3] Schedule 6 of the Fisheries Act 1996 (Schedule 6) provides that a commercial fisher may return rig to the waters from which it was taken if (a) that rig is likely to survive on return; and (b) the return takes place as soon as practicable after the rig is taken. https://legislation.govt.nz/act/public/1996/0088/latest/DLM401761.html

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

50. Input from Te Waka a Māui me Ōna Toka Iwi will further inform if the current allowances remain adequate for whanau needs and provide for pātaka (a place where fish is stored for customary purposes).

## 5.3 Recreational

51. The increasing abundance of snapper over the last decade in Tasman and Golden bays has been very positive for the recreational sector. The availability of snapper has seen greater participation in the Tasman and Golden Bay recreational fishery, resulting in increases in catch of other recreational species such as red gurnard.

52. The most recent National Panel Survey of Marine Recreational Fishers (NPS; 2017/18) results are provided in Table 2 below. They show an increase in estimated recreational harvest for both snapper and red gurnard, and that rig harvest has declined slightly since the 2011/12 survey (Table 2).

**Table 2: Latest recreational harvest estimates for GUR 7 (rounded up).**

| Fish stock | 2011/12 Estimated harvest (tonnes) | CV (tonnes) | 2017/18 Estimated harvest (tonnes) | CV (tonnes) |
|---|---|---|---|---|
| **SNA 7** | 89 | ± 15 | 147 | ± 24 |
| **GUR 7** | 12 | ± 3 | 38 | ± 7 |
| **SPO 7** | 21 | ± 5 | 19 | ± 5 |

53. The NPS estimates do not include recreational harvest taken as recreational catch on commercial vessels under s111 (of the Fisheries Act 1996) general approvals. For the 2021 fishing year approximately 1,700 kg of SNA 7, 248 kg of red gurnard and 112 kg of rig was taken under s111 approvals. Snapper and red gurnard take was slightly higher than the previous year and rig was slightly down.

54. Recreational allowances have increased over time for red gurnard. Snapper has remained unchanged since in 2016 when the recreational allowance for snapper was increased from 90 tonnes to 250 tonnes. This was based on preliminary estimates of recreational catch (of 306 tonnes) from a survey that was underway at the time but not complete. When the survey was completed and analysed, the final estimate of recreational catch was much lower than the preliminary estimate. Regardless, in 2020 the Minister acknowledged various estimates of recreational catch show a steep increasing trajectory for recreational snapper catch in SNA 7 and that best available information suggested the allowance was within a reasonable range of catch estimates for recreational catch.

55. FNZ considers that recreational rig target catch may continue to decrease as fishers have more success targeting more popular species such as snapper and red gurnard, and due to the recent extension of the set net ban out to 4 nautical miles offshore within Tasman and Golden bays to protect Hector's dolphins.

56. Recreational fishers are subject to numerous method and area restrictions in FMA 7, including a minimum fish length of 25 cm for both snapper and red gurnard. A combined daily bag limit of 20 finfish per fisher (excluding baitfish and freshwater eels) also applies. There is an individual daily bag limit within the combined daily bag limit of 10 snapper per fisher outside of Marlborough Sounds and 3 snapper per fisher within the Marlborough Sounds.[5]

## 5.4 Other sources of mortality caused by fishing

57. Other mortality caused by fishing targeting snapper, red gurnard and rig includes mortality from fish escaping fishing gear and discarding (both mandatory for sub minimum legal size and illegal). Previous sustainability measure decisions have acknowledged the improvements in commercial mixed-trawl fishing practices in FMA 7 (e.g., use of lighter gear, larger mesh size, and a reduction in headline height). This has resulted in retaining or moving the other mortality

[5] Marlborough Sounds snapper is considered a different biological stock to the Tasman and Golden bays fishery.

allowance toward 5% of the TACC (currently 7% for snapper, 5% for red gurnard and 9% for rig), unlike in other management areas where the allowance for inshore trawl caught stocks is generally set at a level that equates to 10% of the stocks TACC.

58. Little is known about fishing mortality from recreational fishing practices such as high grading in SNA 7, GUR 7 and SPO 7. FNZ has commissioned new research to investigate mortality from non-commercial fishing practices. In the interim, an appropriate indicator is commercial fishing information for SNA 7, GUR 7 and SPO 7. Therefore, a similar default allowance as a percentage of the TACC is applied.

59. In 2018, the then Minister of Fisheries increased the other mortality allowance for rig from 5% of the TACC to 9%. However, in 2020 new measures were introduced to prohibit the use of commercial and recreational set netting out to 4 nm offshore within Tasman and Golden bays to protect Hector's dolphins. FNZ considers is timely to align rig with other species caught in the mixed-trawl fishery and proposes to apply a standard other mortality allowance of 5% of the TACC for snapper, red gurnard and rig in FMA 7. This takes into account the biological characteristics of rig, that the risk of mortality caused by set nets has been reduced by the implementation of the set net restrictions, that rig is part of the mixed trawl fishery that has improved fishing practices, and that they can be released alive if they are likely to survive under Schedule 6 of the Fisheries Act 1996.

# 6 Treaty of Waitangi obligations

60. Section 5 of the Fisheries Act 1996 (the Act) requires that the Act be interpreted and people making decisions under the Act to do so in a manner that is consistent with the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (the Settlement Act). The Settlement Act provides that non-commercial customary fishing rights continue to be subject to the Principles of the Treaty of Waitangi and give rise to Treaty obligations on the Crown.

61. Section 10 of the Settlement Act requires the Minister to develop policies and programmes to give effect to the use and management practices of tangata whenua. Consistent with Section 10, the Ministry has worked with Iwi to develop engagement processes that enable iwi to work together to reach a consensus where possible and to inform the Ministry on how tangata whenua wish to exercise kaitiakitanga in respect of fish stocks in which they share rights and interests and how those rights and interests may be affected by sustainability measures proposed by the Ministry.

## 6.1 Input and participation of tangata whenua

62. The manner in which the Ministry provides for input and participation of Māori is not discretionary but arises as a legal obligation from section 10 of the Settlement Act[6] and section 12 of the Act[7]. Section 12 (b) of the Act requires that before undertaking any sustainability process the Minister shall provide for the input and participation of tangata whenua who have a non-commercial interest in the stock or an interest in the effects of fishing on the stock. In considering the views of tangata whenua, the Minister is required to have particular regard for Kaitiakitanga from the perspective of tangata whenua.

63. Consistent with the agreements with iwi under section 10 of the Settlement Act, input and participation of tangata whenua into the sustainability decision-making process is provided mainly through Iwi Fisheries Forums, which have been established for that purpose.

64. Each Iwi Fisheries Forum can 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. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries (however, FNZ will also engage directly with iwi

[6] Section 10 of the Treaty of Waitangi (Fisheries Claims) Settlement act 1992 refers to the effect of settlement on non-commercial Māori fishing rights and interests https://www.legislation.govt.nz/act/public/1992/0121/latest/DLM281461.html

[7] Section 12 of the Act 1996 refers to consultation https://legislation.govt.nz/act/public/1996/0088/latest/DLM395504.html

on matters that affect their fisheries interests in their takiwa).

65. 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*.

66. At the March 2022 hui, FNZ sought input from forum members into the long list of potential stocks for review of October 2022. At that time, the multi-species review was advised dependent on the results of stock assessments. Forum members acknowledged the abundance of snapper, reflected on the Plant and Food snapper releases contributing to abundance and recommended a cautious management approach to this important species.

67. Further engagement on the proposed options will be undertaken at the July 2022 hui to be included in final advice to the minister. FNZ also welcomes any input and submissions on the options from tangata whenua outside of this planned engagement.

## 6.2 Kaitiakitanga

68. Tāmure (snapper), kumukumu (red gurnard) and mango (rig) are identified as a taonga species in 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.

69. Customary tools utilised under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and the Act, provide for tangata whenua to manage local fisheries in ways that best fits local customary practices in the form of mātaitai, taiāpure and temporary closures (Section 186A).

70. There is one taiāpure and seven mātaitai reserves that fall within FMA 7 (Table 3). In December 2021, two temporary closures (Ōkahu and Popotai Taumaka) came into force, however, these do not apply to snapper, red gurnard and rig.

**Table 3: Customary fisheries management areas within FMA 7.**

| Name | Management type |
|---|---|
| Whakapuaka (Delaware Bay) | **Taiāpure**<br>*All types of fishing are permitted within a Taiāpure. The management committee can recommend regulations for commercial, recreational and customary fishing.* |
| Okuru/Mussel Point<br>Tauperikaka<br>Mahitahi/Bruce Bay<br>Manakaiaua/Hunts Beach<br>Okarito Lagoon<br>Te Tai Tapu (Anatori)<br>Te Tai Tapu (Kaihoka) | **Mātaitai Reserve**<br>*Commercial fishing is not permitted within mātaitai reserves unless regulations state otherwise.* |

71. FNZ considers the options to increase the TACs and TACCs proposed in this paper are unlikely to impact on, or be impacted by, the customary fisheries management areas in FMA 7 given the large scale of the FMAs for these three stocks and the spatial distribution of the stocks in relation to the customary areas or their widespread generally. Furthermore, commercial fishing is prohibited in mātaitai. There are no regulations relating to snapper, red gurnard and rig in the Whakapuaka Taiāpure, or bylaws relating to these three stocks in any of the mātaitai.

72. FNZ is seeking input from tangata whenua on how the proposed options for SNA 7, GUR 7, and SPO 7 may or may not provide for kaitiakitanga as exercised by tangata whenua, and how tangata whenua consider the proposal may affect their rights and interests in these stocks.

# 7 Current and proposed settings within the TAC

73. Section 13 of the Act sets out how the Minister shall set a TAC. As SNA 7 is very likely to be at or above target, GUR 7 is virtually certain to be at or above target, and SPO 7 is about a likely as not to be at or above target, all options provided below for each stock are being considered under section 13(2)(c) of the Act. Section 13(2)(c) of the Act requires that a TAC is set that enables the level of any stock whose current level is above that which can produce maximum sustainable yield (MSY) to be altered in a way and rate that will result in the stock moving towards or above a level that can provide MSY, having regard to the interdependence of stocks. In considering the way and rate that the stock is moved towards or above MSY, the Minister can have regard to such social, cultural and economic factors that they consider relevant.

74. In recent years there has been discussion and ministerial direction on whether the HSS default targets remain appropriate, considering potential regime shifts (a change to productivity) and the benefits of managing for higher abundance to increase resilience to environmental change (such as climate change). In adopting a multi-species management approach and recognising the Minister's interest in managing to higher abundance, an alternative management strategy regarding the way and rate that fisheries are managed is required. Factors such as stock productivity, value propositions for each sector, and environmental changes will need to be considered at both an individual stock and multi-species level in determining an alternative stock-specific management target.

75. In the interim, the HSS default target applies to these stocks. The following options provide different ways and rates of managing the three stocks.

## 7.1 Option 1 – status quo

| Stock | TAC | TACC | Customary | Recreational | Other mortality |
|---|---|---|---|---|---|
| **SNA 7** | 645 t | 350 t | 20 t | 250 t | 25 t |
| **GUR 7** | 1,422 t | 1,298 t | 17 t | 42 t | 65 t |
| **SPO 7** | 373 t | 298 t | 15 t | 33 t | 27 t |

76. Option 1 for all three stocks retains the current TAC and other settings. This option manages snapper and red gurnard at much higher abundance levels than the default HSS management targets (40% $B_0$ and 35% $B_0$ respectively) and has a greater likelihood of moving rig above its default management target (primarily because the recreational allowance will remain higher than actual catch).

### SNA 7

77. Snapper in SNA 7 is experiencing a period of high productivity with successive strong recruitment pulses. Maintaining the status quo for SNA 7 is likely to significantly constrain commercial catch and result in loss of utilisation opportunity. Bycatch of snapper will increase, but without a corresponding increase in the TACC commercial fishers will likely incur significant deemed values costs to cover this catch.

78. The recreational allowance for snapper in SNA 7 is higher than the last[8] National Panel Survey 2017/18 estimate of 147 tonnes, however, stock assessment projections (Figure 10) show recreational catch is rapidly increasing as fishers enjoy greater success. The stock assessment model for SNA 7 takes this continued growth of recreational catch into account.

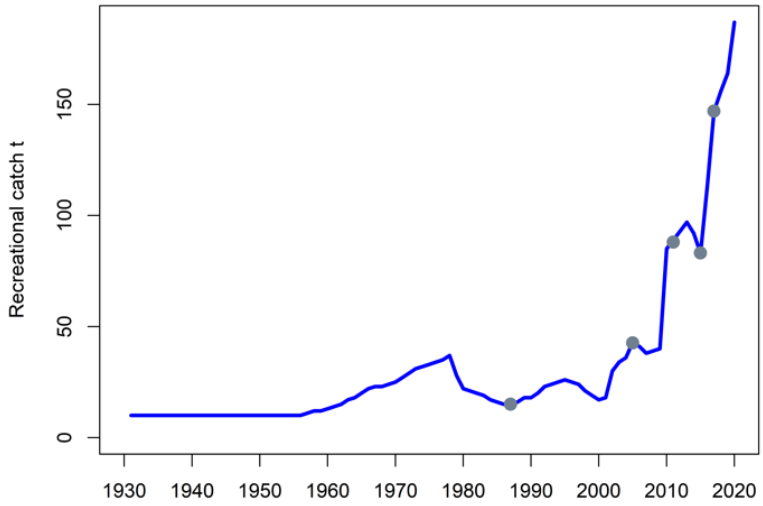


**Figure 10: Recreational catch histories for SNA 7 (in tonnes) included in the stock assessment models. The grey points represent the survey estimates of recreational catch.**

79. Under the status quo (with no increase to the TACC) recreational catch may increase further as the sector will likely benefit from the fish staying in the water longer, increasing in size and being more accessible.

80. In 2021 the Minister signalled he was interested in managing the SNA 8 snapper fishery, which is also doing well, at a higher abundance level (e.g., above $B_{msy}$), but did not choose a particular management target. Rather, he noted his expectation for FNZ to work with tangata whenua and stakeholders to provide him further advice on an alternative target for that fishery. In signalling his preference, the Minister acknowledged the trade-offs (particularly for the commercial sector) and noted the benefits of getting the settings right in important shared fisheries such as snapper.

81. FNZ notes that even under the most precautionary stock projection and with the TAC increase proposed under Option 2 the biomass of SNA 7 is expected to remain above 50% $B_0$.

82. Given the importance of the SNA 7 fishery to all sectors, FNZ brought fishing sector representatives together in the lead up to this review. They noted the challenges currently faced by industry in avoiding snapper given its high abundance, the success of the recreational sector resulting from higher abundance of snapper in this rebuilt fishery, and the high quality of the science that informs management decisions. There is a strong commitment from FNZ and sector representatives to continue discussions on management targets for SNA 7 and other species in this mixed fishery.

## GUR 7

83. Like snapper, red gurnard in GUR 7 is experiencing a period of high productivity with successive recruitment pulses. Maintaining the current management settings will constrain catch, forego a utilisation opportunity and likely incur significant costs to the fishing industry. Unlike snapper, red gurnard has a high turnover of generations (e.g., shorter life span and higher natural mortality[9]) and are less likely to remain in the fishery for future use for an extended period. Retaining the status quo does, however, reduce the likelihood of increased bycatch of snapper and rig in FMA 7.

[8] The next panel survey results are due in 2024.
[9] 31% for GUR 7 compared with 7.5% for SNA 7.

## SPO 7

84. Rig are a low productivity species and are more vulnerable to overfishing than red gurnard. New Zealand has international obligations under the National Plan of Action for Sharks (NPOA Sharks) to maintain elasmobranchs at or above target. The NPOA Sharks sets goals and objectives for maintaining the biodiversity and long-term viability of New Zealand shark populations.

85. Under Option 1, there is a greater likelihood that SPO 7 will be maintained at or move above its default management target (primarily because the recreational allowance will remain higher than actual catch).

86. If the Minister decides it is appropriate to increase the TAC and TACC for one of the other stocks under review (particularly red gurnard) it is likely that bycatch of rig will increase (noting fishers can return rig back to sea provided they are likely to survive rather than pay deemed values).

## 7.2 Option 2

| Stock | TAC | TACC | Customary | Recreational | Other morality |
|---|---|---|---|---|---|
| **SNA 7** | 743 t (↑ 98 t) | 450 t (↑ 100 t) | 20 t | 250 t | 23 t (↓ 2 t) |
| **GUR 7** | 1,582 t (↑ 160 t) | 1,450 t (↑ 152 t) | 17 t | 42 t | 73 t (↑ 8 t) |
| **SPO 7** | 371 t (↓ 1 t) | 315 t (↑ 17 t) | 15 t | 25 t (↓ 8 t) | 16 t (↓ 11 t) |

87. Option 2 provides an increase to the TAC and the TACC of snapper and red gurnard, and slightly reduces the TAC for rig (but within this TAC increases the TACC and reduces the recreational allowance). Option 2 also standardises the other mortality allowance to 5% of the TACC for each stock reflecting improved fishing practices and new restrictions on setnet use out to 4 nm.

## SNA 7

88. Option 2 considers the new stock assessment for SNA 7 and that its status is very likely (>90%) to be at or above target. It provides a utilisation opportunity for commercial fishers in a time of high abundance of snapper in SNA 7 and moves the stock in an active way and rate towards its default target.

89. The additional 100 tonne TACC proposed under this option has been analysed through the SNA 7 stock assessment model[10]. Projections indicate that even with the additional 100 tonnes of catch proposed under this option the stock biomass will remain well above the default management target of 40% $B_0$. Even at the lower (25th percentile), more precautionary range of the projection the proposed increase is expected to retain the stock above 50% $B_0$ (see Table 4).

**Table 4: Projections with additional 100 t (+10% unreported) TACC from 2022/23.**

| Model option | $SB_{2025}/B_0$ | $Pr(SB_{2025} > X\% B_0)$ | | |
|---|---|---|---|---|
| | | 40% | 45% | 50% |
| ***Base*** | 0.883 (0.619–1.268) | 1.00 | 1.00 | 1.00 |
| **Lower 25% Quantile** | 0.719 (0.550–0.785) | 1.00 | 0.99 | 0.98 |

[10] The projections followed the same method as that for the projections at current catch other than retaining the current level of TACC for the first year and increasing the TACC from 2022-23 and subsequent years. Note, these projections were run at the request of Fisheries Management and have not been peer reviewed through the Inshore Finfish Working Group.

90. Based on the 2020/21 port prices, the proposed increases in TACC under Option 2 for snapper will generate a further $481,000 per year in commercial fishing revenue. It is important to note that port price is an average of what commercial fishers receive across a QMA, 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.

91. FNZ considers that Option 2 is consistent with the Te Waipounamu Iwi Fisheries Forum Plan management objectives; particularly Objective 3 for SNA 7, 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. Te Waka a Māui me Ōna Toka Iwi Forum recommended a cautious management approach for taonga species (particularly snapper) at a recent hui. FNZ considers the proposed increases under Option 2 are cautious and responsive to current levels of abundance for snapper while still managing the stock to higher abundance.

92. Option 2 also proposes to retain the current recreational allowance. As mentioned above, FNZ considers this is a reasonable estimate as the stock assessment projections show that recreational catch has significantly increased over the last few years and will likely continue to do so in response to availability and fisher success.

93. FNZ notes that recreational and customary allowances do not restrict fishers' activities unless there is a management action (e.g., changes to daily bag limit) associated with them (nor are they a target). No restrictive management actions are being proposed for recreational or customary fisheries in combination with the Option 2. However, FNZ has received a request to increase the Marlborough Sounds bag limit in response to increasing biomass and is seeking feedback on this request (see other matters below).

## GUR 7

94. Option 2 takes into account the recent stock assessment and status of the stock of GUR 7 is virtually certain (>99%) to be at or above target.

95. Option 2 provides a utilisation opportunity for commercial fishers in a time of high abundance of GUR 7 and moves the stock in an active way and rate towards its default target. While no projections are available for GUR 7 that incorporate the proposed additional TACC, the stock's status suggests the risk of the stock moving below target with the proposed increased exploitation rate before the next stock assessment (2025) is low.

96. Based on the 2020/21 reported port prices, the proposed increase in TACC for red gurnard will generate a further $354,160 per year in commercial fishing revenue to the commercial fisher. This is not what the fish is worth at market and does it reflect the income for wholesalers and/or processors, and retailers.

97. Option 2 proposes to retain the current recreational allowance for GUR 7. FNZ acknowledges that like snapper recreational catch has likely increased over the last few years and will likely continue to do so in response to availability and recreational fisher success. Recent increases to red gurnard recreational allowances have taken this into account and no further changes to recreational allowances for GUR 7 is being proposed at this time. Nor is any management action (e.g., changes to daily bag limit) proposed to manage recreational catch within the allowance.

98. Option 2 is consistent with the Te Waipounamu Iwi Fisheries Forum Plan management objectives; particularly Objective 3 for GUR 7, 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. Te Waka a Māui me Ōna Toka Iwi Forum recommended a cautious management approach for taonga species at a recent hui. FNZ considers the proposed increases under Option 2 are cautious and responsive to current levels of abundance for red gurnard.

## SPO 7

99. The recent stock assessment and status of the stock of SPO 7 is about as likely as not to be at or above target. There are sources of uncertainty associated with this assessment (the trawl

survey results conflicting with CPUE, lack of information on the stock abundance during a period when rig was previously heavily fished, and that large females are not adequately captured). This uncertainty goes both ways, i.e. it could mean that stock status is underestimated or that it is overestimated.

100. The interdependencies between rig and red gurnard suggest that an increase in red gurnard TACC will likely increase the bycatch of rig. However, there is limited scope to provide any increase to the TAC as the recent stock status assessment suggests SPO 7 is being managed appropriately at the current exploitation rate.

101. Option 2 places weight on recreational catch declining in real terms because of recent set net bans and a preference by recreational fishers to target other species such as snapper and red gurnard. If this reduction does not eventuate, there is a greater risk of moving SPO 7 below its target and impacting on the status of the stock under this option. This risk is particularly relevant given rig's low productivity, its susceptibility to overfishing, and New Zealand's obligations under the National Plan of Action for Sharks. Rig is monitored by the biennial trawl survey, therefore, if a decline in abundance estimates is observed in 2024 it would require further responsive management action to ensure rig remains at its target level.

102. Option 2 would provide a small opportunity for commercial fishers to balance any increase in bycatch associated with increases in the TACC for snapper and red gurnard with ACE. Based on the 2020/21 reported port prices, the proposed increase in TACC for rig will generate a further $60,010 per year in commercial fishing revenue. As noted, this is not what the fish is worth at market (which is higher) or include revenue of wholesalers and/or processors and retailers.

103. Te Waka a Māui me Ōna Toka Iwi Forum recommended a cautious management approach for taonga species at a recent hui. Rig are a taonga species in the Te Waipounamu Iwi Fisheries Forum Plan and Option 2 is a less cautious approach for the management of rig, which considers the sources of uncertainty of the recent stock assessment may under estimate the stock status, and that with an increase in snapper and red gurnard catch that rig bycatch may also increase. Option 2 for rig will support some but not all objectives of the Te Waipounamu Iwi Fisheries Forum Plan. FNZ will seek further input from Te Waipounamu Iwi at the July hui on its preferred option for rig.

# 8 Environmental interactions

104. The key environmental principles, which must be taken into account when considering sustainability measures for SNA 7, GUR 7 and SPO 7 are as follows:
    (a) Associated or dependent species should be maintained above a level that ensures their long-term viability (in particular marine mammals, seabirds, fish and invertebrate bycatch).
    (b) Biological diversity of the aquatic environment should be maintained (in particular the benthic impacts from fishing); and
    (c) Habitats of particular significance for fisheries management should be protected.

105. Overall, FNZ considers the proposed options for all three fish stocks will having varying impacts on environmental interactions (discussed below). The options proposed to increase TACCs reflect the increased abundance of snapper and red gurnard and associated bycatch of rig and would allow for more efficient harvesting (less avoidance behaviour and less use of deemed values) rather than significantly increased fishing effort. However, given the quantities proposed it is likely that Option 2 will result in some increased fishing effort.

106. It is important to note in some cases FNZ has made some assumptions about environmental interactions based on fisher reported data that may not have been independently verified (e.g., by an on-board FNZ Observer). Observer coverage is negligible for SNA 7, GUR 7 and SPO 7, all averaging below 5% over the past 5 fishing years based on event level data[11]. Observer

[11] This coverage was calculated based on fishing events in which the fish stock was recorded as caught and an observer was on board. This metric does not reflect the overall level of monitoring in the fishery.

effort has been prioritised to monitor protected species interactions in fisheries considered to be higher risk.

107. Increased uptake of cameras onboard vessels in FMA 7 will enhance FNZ's abilities to monitor environmental interactions in these fisheries (refer to section 11.2 for more details).

## 8.1 Marine Mammals

108. In general, trawl fisheries have been assessed as posing a substantially lesser risk to dolphins than commercial setnet fisheries. 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 for SNA 7, GUR 7 and SPO 7, is largely managed under the current trawl restrictions.

109. Sea lions are generally not found as far north as FMA 7.

110. Regardless, sometimes marine mammals are accidentally caught during commercial fishing. Commercial fishers must file daily reports about what they have caught. Catch and spatial reporting shows that since 2019 four fur seals have been caught and killed within the 12 nm range[12]. However, these captures are not associated with trips targeting snapper, red gurnard or rig.

## 8.2 Seabirds

111. The most recent Spatially Explicit Fisheries Risk Assessment ranks black petrel as the most at risk seabird, followed by the Salvin's albatross, Westland petrel, flesh-footed shearwater, southern Buller's albatross, and Gibson's albatross (AEBAR 2019-20).

112. Seabird interactions with New Zealand's commercial fisheries are managed under the National Plan of Action - Seabirds 2020. The 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 seabird populations.

113. FNZ and the fishing industry have worked collaboratively for over a decade, more recently for the inshore fleet, to ensure 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. While there is no legal requirement that fishers have a PSRMP, more than 90% of the full-time vessels that operate in the mixed trawl fishery have, and follow, one.

114. Like marine mammals, seabirds can accidentally get caught during commercial fishing and commercial fishers must file daily reports about what they have caught. Catch and spatial reporting shows that since 2019 that one unidentified petrel, prion or shearwater and one albatross (unidentified) have been caught and killed in the inshore mixed trawl fishery (within the 12nm range) when targeting red gurnard.

## 8.3 Fish bycatch

115. Fish and invertebrate bycatch information in the mixed trawl fishery is primarily from research trawl surveys. Trawl surveys along the west coast of the South Island and in Tasman and Golden Bays have captured more than 50 finfish species including spiny dogfish, red cod, barracouta, tarakihi, hake and Jack mackerel. Invertebrates captured included sponges, mussels, octopus and arrow squid.

116. Flatfish is of particular interest as a bycatch species associated with target snapper and red gurnard catch in the Tasman and Golden Bay mixed trawl fishery. As mentioned above there are interdependencies between snapper and red gurnard with flatfish. With an increase in

[12] To 26 April 2022

targeted snapper and red gurnard there is a risk that flatfish bycatch may also increase particularly if commercial fishers move further inshore due to the availability of ACE.

117. From a commercial perspective, an increase in bycatch will not incur undue cost on fishers as the current TAC and TACC is set at a historically high level and has substantial headroom to allow for fluctuations in catch and abundance. However, as mentioned above there are eight flatfish species within the generic FLA 7 species code. Sand flounder is mostly taken from Tasman and Golden Bays and has recently (2022) been assessed to be about as likely as not to be at or above target and the overfishing threshold. Brill and turbot are mostly taken from the west coast South Island portion of FLA 7 and are also about as likely as not to be at or above target and at the overfishing threshold. New Zealand sole is taken mostly along the west coast of the South Island but is unlikely to be at or above the target and it is likely that overfishing is occurring. These four species make up approximately 80% of FLA 7 catch and any increase in bycatch or target catch risks moving these stocks below their default target and toward the soft limit, particularly in the case of New Zealand sole, which may trigger a formal time-constrained rebuilding plan.

118. During the 2020 SNA 7 TAC review some concerns were raised that commercial fishers could move further inshore with more available ACE. This concern was raised in the context of spatial conflict. However, it is also relevant to the risk of increasing the bycatch of flatfish. Through geospatial analysis FNZ can confirm this has not occurred, this is also validated in the stock assessment with evidence of a shift to targeting snapper in deeper waters. Furthermore, catch records show flatfish catch has been relatively stable for the past three years in response to previous increases to snapper and red gurnard TAC and TACC increases.

119. Commercial fishers are expected to continue to adapt their fishing practices to reduce the risk of increased bycatch and the target catch of flatfish. FNZ will continue to monitor electronic and geospatial position reporting and may review FLA 7 if action is required to address the risk to flatfish populations.

120. John dory is another bycatch species associated with red gurnard target trawls. John dory has recently been assessed to be about is likely as not to be at target and at the overfishing threshold. It has been under caught in the last three years. FNZ will continue to monitor the impact of the proposed TAC and TACC changes on John dory catches.

121. Tarakihi in TAR 7 tends to be caught in the outer reaches of Golden Bay and down the west coast. The proposed increases to TAC and TACCs could result in a minor increase in bycatch of tarakihi. However, in the 2019-20 fishing year TAR 7 was only 88% caught and the 2020-21 fishing year it was 95% caught. This along with its current stock status of likely to be at or about target suggests the proposed options to increase the TAC and TACCs of snapper and red gurnard present a low risk of adversely impacting on tarakihi.

## 8.4 Benthic impacts

122. Tasman and Golden bays in FMA 7 have historically been intensively fished, including by trawling. Trawling can directly impact on biological diversity of the benthic environment. However, with the implementation of the QMS the inshore fleet has consolidated, and gear technology has improved to create efficiencies and mitigate environmental impacts.

123. Research on the effects of bottom trawling and dredging has occurred in Tasman and Golden bays including a gradient analysis to investigate the importance of the different factors affecting epifaunal and infaunal communities. Trawling and dredging have been identified as important factors in explaining the variance in some community structure.

124. A characterisation of coastal marine habitats in FMA 7 (Department of Conservation et. al., 2011) indicates that Tasman and Golden bays are predominately mud and sand, with gravel appearing more frequently on the west coast of the South Island. More biogenic habitats occur around estuaries (eg, saltmarshes) and nearshore areas such as bryozoan mounds and seagrass beds. Concerns have previously been expressed that increases in TACC (particularly for snapper) could see commercial fishers shifting effort closer to shore. However, spatial data since the last increase to SNA 7 TACC (2020) shows that this has not occurred. Stock

assessment analysis also provides evidence that commercial fishers are fishing deeper. Communities that occur within the habitat types located further offshore and deeper (e.g., sand and mud in the bays) are likely more resilient to the impact of resuspended sediment than the more sensitive biogenic habitats located closer to shore.

125. Furthermore, there are regulatory and non-regulatory (i.e., voluntary) closures that prohibit trawling in nearshore areas (e.g., the prohibition on fishing at Separation Point and Farewell Spit) and depth requirements for commercial vessels also mitigates/prevents fishing in shallow areas. In FMA 7 there are also several marine reserves (covering approximately 21,000 ha in total) and two mātaitai that exclude commercial fishing (Te Tai Tapu (Anatori) Mātaitai and Te Tai Tapu (Kaihoka) Mātaitai). These areas closed to fishing and provide protection from benthic impact fishing methods.

## 8.5 Habitats of particular significance for fisheries management

126. FNZ considers that habitats of particular significance for fisheries management are an area or areas of particular significance in supporting the productivity of fisheries resources.

127. Tasman and Golden bays are described in literature as areas of importance to snapper, red gurnard and rig (Table 5). As discussed above there are several existing, and long-standing, regulatory and non-regulatory (voluntary) closures are in place in Tasman and Golden bays for areas considered important nursery and/or spawning areas for snapper and rig. Red gurnard demonstrate a different spawning behaviour (long and widespread), however, Tasman and Golden bays are generally considered a nursey area that supports the west coast South Island population (Morrison et. al., 2014).

128. The greatest threats to snapper, red gurnard and rig habitats and recruitment may be from climate change, particularly changes in water temperature, water circulation and associated changes in food supply and sources, and increased storm events and land-based inputs into the marine ecosystem. Preliminary findings by NIWA, suggests the likely cause for the degradation of Separation Point is sediment from cyclone Gita.

129. However, recruitment over the last decade has been exceptionally good for snapper and red gurnard, suggesting that environmental factors affecting egg and larval survival in the ocean have been favourable and have had a positive influence on the number of fertilised eggs surviving to adulthood. Furthermore, the existing fisheries restrictions and other no take areas such as marine reserves are contributing to mitigating the impacts of bottom contact fishing methods on habitats generally.

130. The options proposed to increase the TAC and TACCs for snapper, red gurnard and rig may result in some increase in fishing effort. However, given the existing protections and current fishing practices adopted by commercial fishers FNZ considers that any additional risk to habitats of particular significance for fisheries management will be low. Based on available information FNZ has not identified any new areas of particular significance for fisheries management for snapper, red gurnard and rig in FMA 7 that require protection at this time.

**Table 5: Summary of information on habitats of particular significance for SNA 7, GUR 7 and SPO 7.**

| Stock | SNA 7 |
|---|---|
| **Habitat of particular significance** | **Separation Point.**<br>**While literature notes the importance to snapper spawning in Tasman Bay it is relatively general and the exact location of other habitats of significance is not known.** |
| **Attributes of habitat** | • Snapper have a short larval period where they occupy the middle of the water column. They feed visually and water temperature appears critical to the early life stages of snapper. Spawning occurs when water temperature reaches 14.8 to 16°C. The strength and direction of wind and its effect on water column mixing and productivity is also important to larval survival for providing food for snapper larvae (Cummings et. al., 2014).<br>• Juveniles favour shallow water in estuaries (associated with structured habitat types such as sub-tidal seagrass) then leave after and about 3-5 months (Morrison et. al., 2014) and appear in shallow coastal environments. Therefore, connectivity to other habitats is important to other life stages. |
| **Reasons for particular significance** | • The habitats are likely to provide shelter, protection from predation and harvesting, and suitable food and temperature for larval and juvenile fish survival, growth and development. |
| **Risks/Threats** | • Climatic factors and disturbance regimes such as increasing ocean temperature, decreased dissolved oxygen, ocean acidification, coastal erosion and sedimentation, altered precipitation, increased storm frequency and severity will impact on visibility within the water column, available food supply and composition, and larvae survival.<br>• An increase in land-based sediment and nutrient runoff can be detrimental to structured habitats (as early indications suggest for Separation Point), which can result in a loss of habitat function (e.g., protection and shelter) for juvenile fish. |
| **Existing protections** | • Separation Point between Tasman and Golden bays was close to fishing in 1980. This area is considered a nursery ground for snapper, tarakihi, cod, leatherjackets and other fish that hide and fed in the bryozoans colonies.<br>• Although not specific to habitats of significance, there are several fishing restrictions that will indirectly provide some protection from harvesting and/or bottom impacts and water column disturbance to snapper habitats and recruitment:<br>o Pair trawling with a net cod-end mesh size less than 125mm is prohibited in Tasman Bay.<br>o Trawling is prohibited from 1 November to 30 April the following year in inner Golden Bay. This timing corresponds with when snapper aggregate to spawn. |
| **Stock** | **GUR 7** |
| **Habitat of particular significance** | **Tasman and Golden bays. Information is relatively general for red gurnard habitats in FMA 7 and while preferred habitat occurs in the bays the exact location is relatively unknown.** |
| **Attributes of habitat** | • Egg and larval development take place in surface waters and recruitment may be influenced by surface water temperatures.<br>• Juveniles prefer shallow enclosed embayments and their preferred temperate range is between 11-18°C. Diet consists mostly of crustaceans (galatheids and crabs) generally found in shallow muddy areas (Cummings et. al., 2014). This suggests that shallow, sheltered waters with the right temperature and rich food supply are key attributes for recruitment. |
| **Reasons for particular significance** | • The possible habitat of significance is likely to provide the right conditions for the growth and development of juveniles to support productivity of the stock. |

| | |
|---|---|
| **Risks/Threats** | • Changes in surface water temperature could affect egg and larvae development and survival.<br>• Increased temperatures, ocean acidification, sedimentation and nutrient runoff might impact on the function of the habitat to support growth and development of red gurnard. |
| **Existing protections** | • There are no existing protections for habitats of significance for red gurnard in GUR 7. However, existing fishing restrictions will provide some indirect protection for red gurnard recruitment. |
| **Stock** | **SPO 7** |
| **Habitat of particular significance** | **'*The Banks*' inside Farewell Spit.** |
| **Attributes of habitat** | • Young are generally born in shallow coastal waters (e.g., harbours and estuaries) during spring/summer. They grow rapidly over their first summer then move to deeper waters. They have a broad temperature range of around 9 to 18°C and feed on benthic invertebrates such as crustaceans and worms (Cummings et. al., 2014). This suggests that shallow coastal waters with the right temperature and rich food supply are key attributes for recruitment. |
| **Reasons for particular significance** | • The habitat of significance is likely to provide the right conditions for the growth and development of juveniles to support productivity of the stock. |
| **Risks/Threats** | • Changes in water temperature could affect season movements to current nursey habitat.<br>• Increased temperatures and ocean acidification might impact on the abundances of food (particularly crabs).<br>• Increased sedimentation and nutrient runoff could adversely impact the structure and function of the habitat. |
| **Existing protections** | • 'The Banks' inside Farewell Spit is an area of particular significance as a rig pupping and nursey ground. Under the SPO 7 Fishery Plan Industry closed the area around Farewell Spit to commercial trawling and setnet fishing.<br>• Although not specific to protecting the habitat of significance, existing fishing prohibitions can provide an indirect protection from bottom impact methods and disturbance (e.g., trawling is prohibited from 1 November to 30 April in inner Golden Bay). |

131. FNZ will be starting an online consultation in mid-2022 on draft guidelines for identification of habitats of particular significance for fisheries management and the operational proposals to support its application. We would welcome your feedback. More information will be available on https://www.mpi.govt.nz/fishing-aquaculture/ when the consultation starts.

## 8.6 Climate related considerations

132. A recent literature review on the effects of ocean acidification on New Zealand snapper (Parsons et al. 2021) illustrates the potential impacts of ocean acidification and warming sea temperatures on sensory development of snapper. Increased acidic conditions has been shown to reduce hearing frequencies of snapper which may affect recruitment to suitable habitat. Warming seas have also been shown to reduce snapper olfactory senses and result in reduced response to predatory cues. As ocean acidification and sea temperatures increase we may see lower recruitment survival and increased predation on snapper.

# 9 Relevant plans, strategies, statements and context

133. The following plans and strategies are relevant for SNA 7, GUR 7 and SPO 7.

## 9.1 Draft National Inshore Finfish Fisheries Plan

134. Although not yet approved under section 11 A of the Act, the National Inshore Finfish Fisheries Plan (the Plan) provides guidance on FNZ's management strategies for inshore finfish stocks including SNA 7, GUR 7 and SPO 7. The Plan outlines the management objectives and strategies for finfish fisheries for the next five years and was consulted on in early 2020.

135. The Plan is aimed at progressing New Zealand towards ecosystem-based fisheries management. Stocks are grouped within the Plan, with management approaches and objectives tailored accordingly for each group.

136. SNA 7 is categorised as a Group 1 stock in the Plan. Group 1 stocks are considered those that provided the greatest benefit and are highly desirable to all sectors. They are managed to maximise the level of use while mitigating the increased risk to their sustainability as a consequence of high levels of fishing pressure. Stock status is determined using fully quantitative stock assessments to provide high levels of information, certainty of stock status and assurance that the stocks are sustainably managed.

137. GUR 7 and SPO 7 are Group 2, which recognises the need to manage it to provide for moderate levels of use with moderate levels of information to monitor its stock status (e.g., a partial quantitative assessment based on trends in relative abundance and Bmsy proxy target levels based on accepted reference periods or less frequent fully quantitative stock assessments).

138. The plan also identifies FNZ's five key focus areas that provide direction for the management of inshore fisheries. Those being: managing individual stocks, enhancing benefits for customary, commercial and recreational fisheries, enabling integrated multi-stock management, improving local fisheries, and improving environmental performance.

139. The multi-species approach of this paper is a step towards multi-stock management whereby we have considered more explicitly the interdependences of these three stocks, and others, that are caught together.

## 9.2 Regional Plans

140. Under the Resource Management Act 1991, there are several regional plans in place within SNA 7, GUR 7 and SPO 7 to address the cumulative effects of activities in the coastal marine area, and the adverse impacts from land-based activities on the marine environment.

141. Fishers are subject to the provisions in the plans (for example, small scale restrictions on fishing methods in the Marlborough Sounds[13]) which the Minister shall have regard to under section 11 of the Act. FNZ considers that the small scale of the restrictions in relation to the large management areas of SNA 7, GUR 7 and SPO 7, and their location within existing trawl restrictions, means these rules do not, in general, stop fishers taking their catch from other areas within the QMA.

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

142. Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy sets a strategic direction for the protection, restoration and sustainable use of biodiversity, particularly indigenous biodiversity, in Aotearoa New Zealand. The Strategy sets a number of objectives across three timeframes. The most relevant to setting sustainability measures for SNA 7, GUR 7 and SPO 7 are objectives 10 and 12:

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

[13] A prohibition on dredge and trawl fishing methods in numerous marine sites of ecological significance.

**Objective 12:** Natural resources are managed sustainably.

143. The Ministry for Primary Industries (MPI) is undertaking work to support this strategy, as well as the requirement under the Act to avoid, remedy or mitigate adverse effects on the aquatic environment. The Environmental Interactions section in this paper provides information on relevant interactions with the wider aquatic environment for these stocks.

## 9.4 National Plan of Action for Sharks

144. The National Plan of Action for Sharks (NPOA Sharks) is relevant to rig. As an elasmobranch (cartilaginous fish, including sharks, skates, and rays), rig are included in the plan. The Plan takes into account the biological characteristics of rig 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.

# 10 Deemed values

145. Deemed values are the price paid by fishers for each kilogram of unprocessed fish landed in excess of a fisher's ACE holdings. The purpose of the deemed values regime is to provide incentives for individual fishers to acquire or maintain sufficient ACE to cover catch taken over the course of the year, while allowing flexibility in the timing of balancing, promoting efficiency, and encouraging accurate catch reporting.

146. The Deemed Value Guidelines set out the operational policy FNZ uses to inform the development of advice to the Minister on the setting of deemed values.

147. The average price paid by fishers during the 2020/21 fishing year for one kilogram of ACE for SNA 7 was $3.63, GUR 7 was $0.76 per kg, and SPO 7 was $2.16. The 2020/21 port price index for SNA 7 was $4.81, GUR 7 is $2.33 per kg, and SPO 7 is $3.53. As the current deemed value rates of SNA 7 (Table 6), and GUR 7 and SPO 7 (Table 7) are set above the average ACE price, FNZ is not proposing a change in the deemed values for these three stocks.

**Table 6: Standard deemed value rates ($/kg) for SNA 7.**

| Stock | Interim Rate ($/kg) | Annual Differential Rates ($/kg) for excess catch (% of ACE) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 100-110% | 110-120% | 120-130% | 130-140% | 140-150% | 150-160% | 160-170% | 170-180% | 180%+ |
| SNA 7 | 5.40 | 6.00 | 6.75 | 7.50 | 8.25 | 9.00 | 9.75 | 10.50 | 11.25 | 12.00 |

**Table 7: Standard deemed value rates ($/kg) for SPO 7 and GUR 7.**

| Stock | Interim Rate ($/kg) | Annual Differential Rates ($/kg) for excess catch (% of ACE) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 100-120% | 120-140% | 140-160% | 160-180% | 180-200% | 200%+ |
| GUR 7 | 1.53 | 1.70 | 2.04 | 2.38 | 2.72 | 3.06 | 3.40 |
| SPO 7 | 2.70 | 3.00 | 3.60 | 4.20 | 4.80 | 5.40 | 6.00 |

148. FNZ welcomes feedback on these deemed value settings.

# 11 Other considerations

## 11.1 Recreational controls

149. The Marlborough Recreational Fishers Association has requested that the snapper recreational daily bag limit be reviewed for the Marlborough Sounds area and advocates for an increase from 3 per fisher per day to 6 per fisher per day.

150. FNZ is seeking wider feedback on this proposal to inform whether to a review of the relevant regulations is appropriate. If so, further consultation would occur. The Marlborough Sounds is, however, considered a separate biological stock to that in Tasman and Golden bays. Less is known about the Marlborough Sounds population, and the extent of range expansion from the increase in biomass in Tasman and Golden bays and SNA 8 (western North Island) is uncertain.

## 11.2 Fisheries Amendment Bill and On-board cameras

151. The Fisheries Amendment Bill[14], currently before Select Committee, is part of the wider fisheries reform programme. Its goal is to encourage better fishing practices. It aims to update and strengthen New Zealand's fisheries management system. The Bill proposes to change the current rules and policies by:

    (a) tightening commercial fishing rules for landings and discards;

    (b) creating new rules and regulations for offences and penalties;

    (c) introducing new mechanisms for commercial and recreational management decision-making;

    (d) enabling the further use of on-board cameras on vessels; and

    (e) creating a new defence to help save marine mammals and protected sharks and rays.

### 11.2.1 Schedule 6 exemptions

152. The best available information on releases SPO 7 under the Schedule 6 exemption suggests that amount of releases varies annually, but in the most recent fishing year approximately 10 tonnes of rig in SPO 7 was returned under Schedule 6.

153. Schedule 6 exemptions are proposed to be reviewed for relevant species (including rig) as part of the Fisheries Amendment Bill. It is uncertain when the Schedule 6 exemption for SPO 7 will be reviewed, but any changes to its Schedule 6 status could have implications for levels of commercial landings.

### 11.2.2 On board cameras

154. The Minister recently announced key details of the nationwide rollout of cameras on commercial fishing vessels[15]. It is expected that the independent information they will provide will support the reputation of New Zealand's fishing industry, the sustainability of New Zealand's fisheries and provide for more confident management decisions.

155. This will include vessels that use the following methods:

- Set net vessels (8 metres or larger), surface longline, and bottom longline vessels.
- Trawlers of 32 metres or less, except those targeting scampi, and danish and purse seine vessels.

156. Of most relevance to the FMA 7 mixed trawl fishery and the species reviewed in this paper, it is expected that cameras[16] will be installed and transmitting footage on fishing vessels within the following schedule:

- Inshore trawl and set net vessels fishing off the north coast of the South Island by June 2023.
- Inshore trawl vessels operating off the west coast of the South Island by June 2024.

[14] Fisheries Amendment Bill. Ministry for Primary Industries

[15] Rollout of cameras on fishing vessels to begin. Honourable David Parker, Minister for Oceans and Fisheries.

[16] On-board cameras for commercial fishing vessels. Ministry for Primary Industries.

157. It is expected that the On-board camera rollout, and the wider Fisheries Amendment Bill, will enhance our understanding of these stocks, provide for better verified information to underpin fisheries management decisions, and encourage better fishing practices.

# 12 Questions for submitters

- Which option do you support for revising the TAC and allowances? Why?
- If you do not support any of the options listed, what alternative(s) should be considered? Why?
- Are the allowances for customary Māori, recreational and other sources of mortality appropriate? Why?
- Do you think these options adequately provide for social, economic, and cultural wellbeing?
- Do you have any concerns about potential impacts of the proposed options on the aquatic environment?
- Do you agree that the recreational bag limit for snapper in the Marlborough Sounds Area should be increased? If so, to how much per fisher?

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

# 13 How to get more information and have your say

159. FNZ invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 22 July 2022.

160. Please see FNZ's sustainability consultation webpage (https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-2022-october-round/) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz.

# 14 Legal basis for managing fisheries in New Zealand

161. The Fisheries Act 1996 provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* at https://www.mpi.govt.nz/dmsdocument/51712 for more information.

# 15 Referenced reports

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