



# **Review of sustainability measures for red gurnard (GUR 3) for 2023/24**

Fisheries NZ Discussion Paper No: 2023/04

ISBN No: 978-1-991080-71-4 (online)  
ISSN No: 2624-0165 (online)

**June 2023**





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# Stock being reviewed

Red gurnard (GUR 3) – East Coast South Island, Chatham Rise, sub-Antarctic, Southland, Rakiura, and Fiordland



**Red gurnard** – *Chelidonichthys kumu*, kumukumu, pūwhaiu

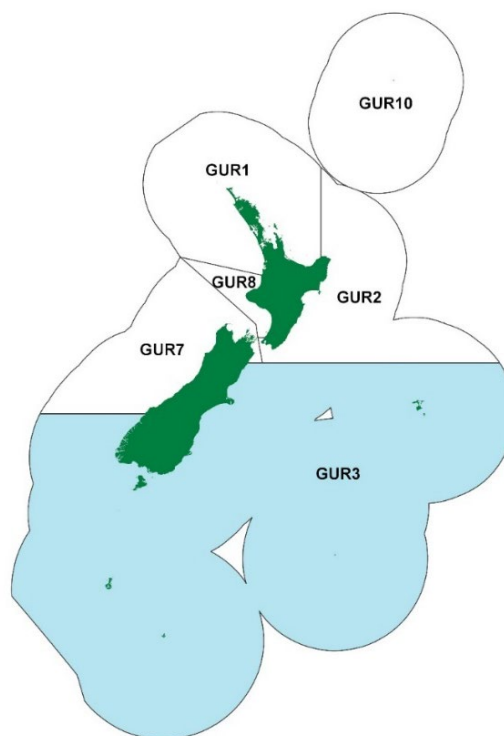


Figure 1: Quota Management Areas (QMAs) for red gurnard, with GUR 3 highlighted.

## 1 Why are we proposing a review?

1. Fisheries New Zealand (FNZ) is reviewing the sustainability measures for red gurnard in Quota Management Area (QMA) GUR 3 for the 1 October 2023 fishing year (Figure 1).
2. The current Total Allowable Catch (TAC) for this stock is 1,695 tonnes, comprising a Total Allowable Commercial Catch (TACC) of 1,575 tonnes, a customary Māori allowance of three tonnes, a recreational fishing allowance of six tonnes and an allowance for all other mortality caused by fishing of 111 tonnes (equivalent to seven percent of the TACC).
3. A fully quantitative stock assessment in 2022 concluded that, at then-current (2021-22) TAC settings, GUR 3 abundance was projected as very likely (>90%) to remain above the target biomass level over the next five years. The subsequent five percent increase in TAC in 2022-23 was a precautionary response to a trend of increasing abundance.
4. Results from the June 2022 east coast South Island (ECSI) trawl survey indicate red gurnard biomass has continued to increase, with the biomass estimate the highest documented in the time-series. The survey results provide greater confidence in the 2022 stock assessment, and suggest a modest utilisation opportunity exists for GUR 3 in 2023/24. However, the 2022 survey indicates that pre-recruit biomass has declined, suggesting recruitment to the fishery will decline in coming years. In addition, the survey does not account for impacts of the 2022-23 TAC increase.
5. Based on this, FNZ is proposing an option to increase the TAC of GUR 3 from 1,695 to 1,779 tonnes under section 13(2)(c) of the *Fisheries Act 1996* (the Act). Within the TAC, it is proposed that the current allowances for customary and recreational fishing are retained, the allowance for other sources of mortality caused by fishing is increased from 111 to 116 tonnes, and the TACC is increased from 1,575 to 1,654 tonnes.

## 2 Summary of proposed options

6. Based on results from the June 2022 ECSI trawl survey and May 2022 stock assessment, and considering the interdependencies identified between stocks in this multispecies fishery (see Section 7.1.3 of this paper), two options are proposed for GUR 3, as outlined in Table 1 below. Option 2, a modest increase to the TAC, is considered an appropriate response and provides a utilisation benefit at a time of higher abundance of red gurnard.

Table 1: Proposed management options (in tonnes) for GUR 3 from 1 October 2023.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Option 1 ( <i>Status quo</i> )	1,695	1,575	3	6	111
Option 2	1,779 (↑ 84 t)	1,654 (↑ 79 t)	3	6	116 (↑ 5 t)

7. FNZ welcomes feedback and submissions on the options proposed, or any alternatives.

## 3 About the stock

### 3.1 Fishery characteristics

8. The GUR 3 QMA incorporates Fisheries Management Areas (**FMA**) 3 (South-East – Coast), FMA 4 (South-East – Chatham Rise), FMA 5 (Southland), and FMA 6 (Sub-Antarctic).
9. In 2020/21 and 2021/22 fishing years, 76.3% and 80%, respectively, of the estimated catch of red gurnard in GUR 3 was recorded from the inshore waters of FMA 3 (Figure 2). Here, red gurnard is a common species predominantly caught in the inshore multispecies trawl fishery along with flatfishes, elephantfish, red cod, tarakihi, blue moki, rig, barracouta, and leatherjacket. During the same period, 23.2% and 19.8%, respectively, of estimated red gurnard catch was recorded from the inshore waters of FMA 5.

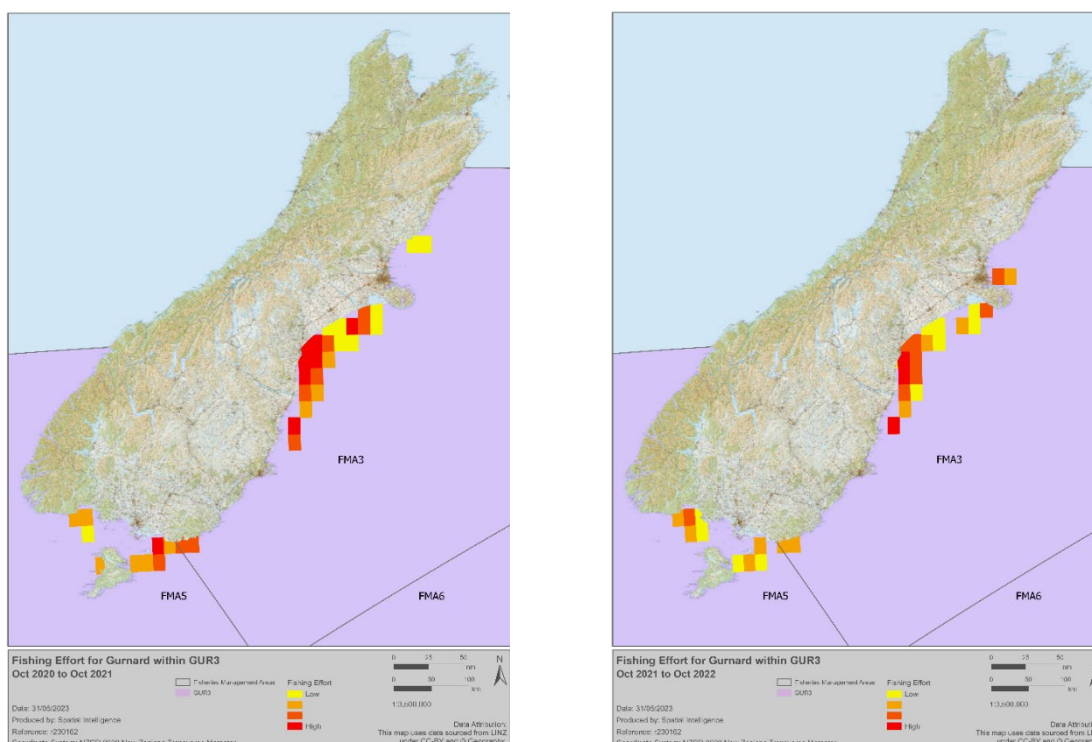


Figure 2: Heat-maps showing fishing effort (all methods) for red gurnard in FMAs 3, 4, 5, and 6 during 2020/21 (left) and 2021/22 fishing years (right).

10. While trawling is the main commercial fishing method for red gurnard, Danish seine is also used. Some red gurnard are also taken in the offshore target tarakihi and giant stargazer bottom trawl fisheries. The level of fishing targeting red gurnard within the ECSI multispecies trawl fishery was historically low, averaging less than 10%, but has increased to approximately 25% since 2017/18.
11. There is a commercial preference for red gurnard over 27 cm in length, with issues identified regarding discard of small red gurnard in the commercial inshore trawl fishery.
12. Rod and line fishing is the preferred recreational fishing method in FMA 3 and FMA 5, with smaller amounts of longlining, spearfishing, and netting.

## 3.2 Biology

13. Red gurnard 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 two to three years of age. Spawning occurs in spring-summer.
14. Red gurnard are found throughout New Zealand coastal waters at depths of 10-200 m, with a preference for mud and sandy seafloor habitat. They feed mainly on crustaceans (especially small crabs and shrimps), small fishes, worms, and squid.

## 3.3 Management background

15. GUR 3 entered the Quota Management System (QMS)<sup>1</sup> in 1986 with a TACC of 480 tonnes. Through quota appeals, the TACC was increased to 900 tonnes in 1996 and then decreased in 2001 to 800 tonnes. In 2012, the TAC and TACC were reviewed, and allowances were set. This will be the fourth review of the management settings since 2015/16 after reviews in 2018/19, 2020/21, and 2022/23 (Table 2).

**Table 2: Changes to GUR 3 management settings (in tonnes) since 2015/16 (October fishing year).**

Fishing year	TAC	TACC	TAC % change
2017/18	1290	1220	n/a
2018/19	1593	1320	+23.5
2020/21	1614	1500	+1.3
2022/23	1695	1575	+5.0

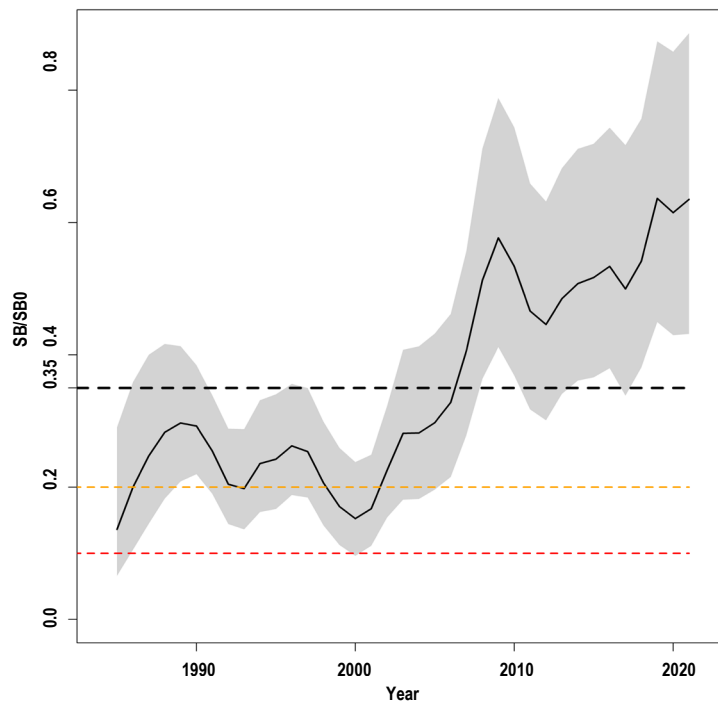
## 4 Status of the stock

16. The best available information on the status of GUR 3 can be found within the May 2023 Fisheries Assessment Plenary report.<sup>2</sup>
17. The first fully quantitative stock assessment of GUR 3 was completed in May 2022.<sup>3</sup> The assessment concluded that, at then-current (2021-22) TAC settings, GUR 3 abundance was projected as very likely (>90%) to remain above the target biomass level over the next five years (Figure 3). The probability of the then-current catch or TAC causing biomass to decline below soft and hard limits was considered very unlikely (<10%) and exceptionally unlikely (<1%), respectively.

<sup>1</sup> For more information about the QMS go to [this link](#).

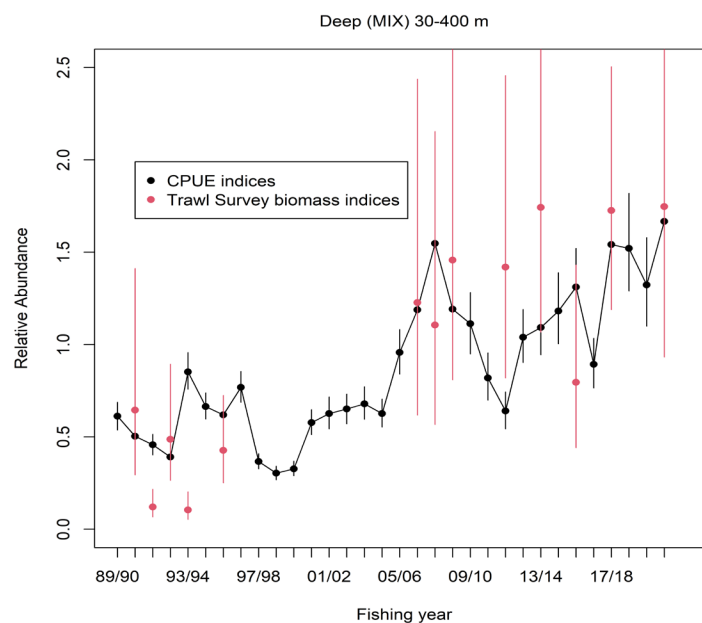
<sup>2</sup> Fisheries New Zealand (2023) – [May 2023 Fisheries Assessment Plenary](#).

<sup>3</sup> Langley (2022). Report accessible at [this link](#).

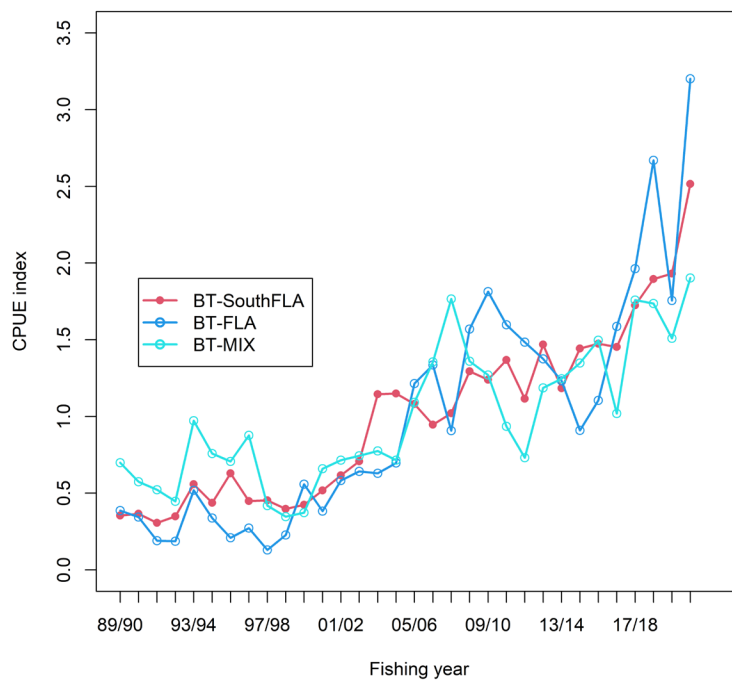


**Figure 3: Annual biomass trend by year for GUR 3. The black solid line represents the median and the shaded area represents the 95% credible interval. The dashed line represents the interim target level (35%  $SB_0$ ). The red and orange dashed lines represent the hard and soft biomass limits, respectively.**

18. Prior to the 2022 stock assessment, GUR 3 was assessed using partial quantitative stock assessments based on standardised Catch Per Unit Effort (**CPUE**) indices. CPUE trends and the results of the 2022 fishery-independent ECSI trawl survey show an increase in abundance since 2000, but with large confidence intervals (**CIs**) (Figure 4). The large CIs for the trawl survey are related to the ECSI trawl survey not being optimised to accurately survey red gurnard prior to 2007, as the original survey area excluded depths shallower than 30 m. Abundance trends are also reflected in CPUE indices from Southland and Otago (Figure 5).

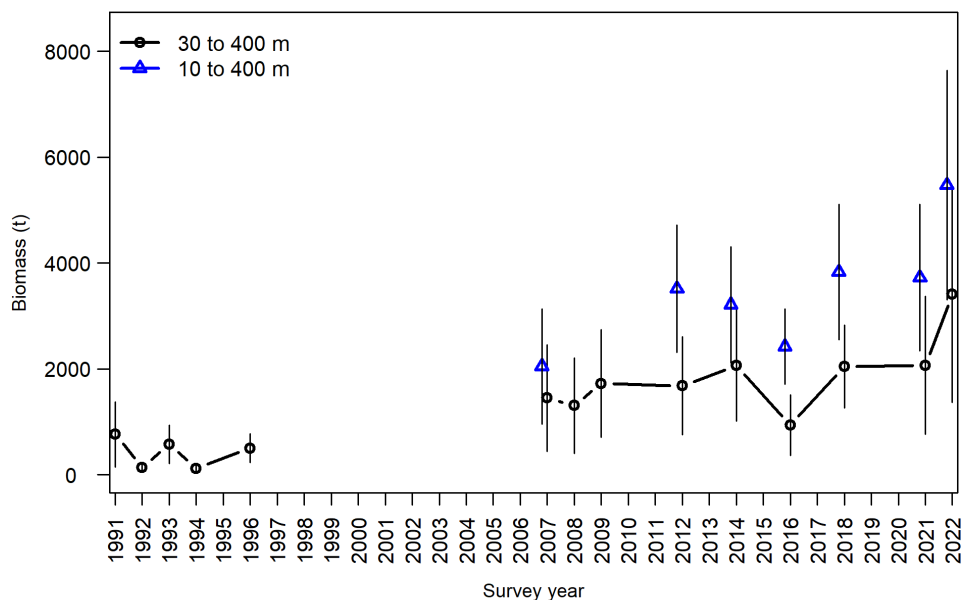


**Figure 4: A comparison of the standardised bottom trawl-mix CPUE indices and the trawl survey biomass estimates for red gurnard from the winter ECSI inshore trawl survey for the 30–400 m depth strata. Error bars show  $\pm 95\%$  confidence intervals. Both sets of indices have been normalised to the average for the years with a survey biomass index.**



**Figure 5: A comparison of the standardised bottom trawl-mix, bottom trawl-flatfish, and Southland/Otago flatfish (BTSouthFLA) red gurnard CPUE indices.**

19. Results of the 2022 ECSI trawl survey, which became available after the 2022 stock assessment, afford greater confidence in the 2022 stock assessment and CPUE trends indicating continued growth in red gurnard biomass. The 2022 core strata (30-400 m) biomass was the highest recorded in the survey time-series, with the core plus shallow strata (10-400 m), biomass trend mirroring those in the core strata, except that biomass was much higher (Figure 6). The core plus shallow strata are considered to be the most appropriate for red gurnard, incorporating important shallow water habitat.



**Figure 6: Red gurnard total biomass for all ECSI winter surveys in core strata (30–400 m) and core plus shallow strata (10–400 m) for species found in less than 30 m in 2007, 2012, 2014, 2016, 2018, 2021, and 2022 (preliminary results). Error bars are +/- two standard errors.**

20. It is important to note that the additional catch of red gurnard (by way of the 2022/23 TACC increase) was taken after the 2022 ECSI trawl survey. Therefore, while the five-percent TAC



increase in 2022-23 was a modest increase underpinned by the 2022 stock assessment, the results of the 2022 ECSI trawl survey do not reflect the impact of this increase.

21. Results from the 2022 ECSI trawl survey also indicate that the increasing trend in red gurnard biomass is accompanied by a decrease in red gurnard pre-recruited biomass (Figure 7). This suggests that recruitment to the fished portion of the population will decline in coming years.

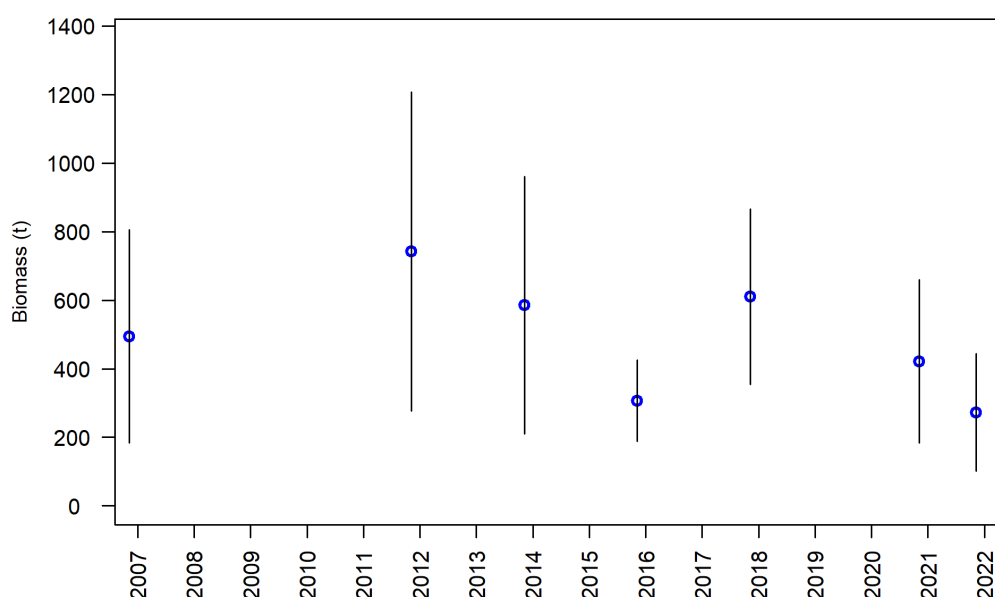


Figure 7: Red gurnard pre-recruited biomass and 95% confidence intervals for 2007-2022 ECSI winter surveys in core plus shallow strata (10–400 m).

## 5 Catch information and current settings within the TAC

### 5.1 Commercial

22. GUR 3 landings regularly exceeded the TACC between 1988/89 and 1995/96. Ageing of fish collected during the ECSI trawl surveys at this time suggests relatively strong year classes moving through the fishery. However, from the 1996/97 fishing year, landings declined. In 2002/03, the TACC for GUR 3 was reduced to 800 tonnes. Since 2000, catch has steadily increased and has been consistently overcaught since 2004, reaching catch levels previously attained in the 1960s (Figure 8).

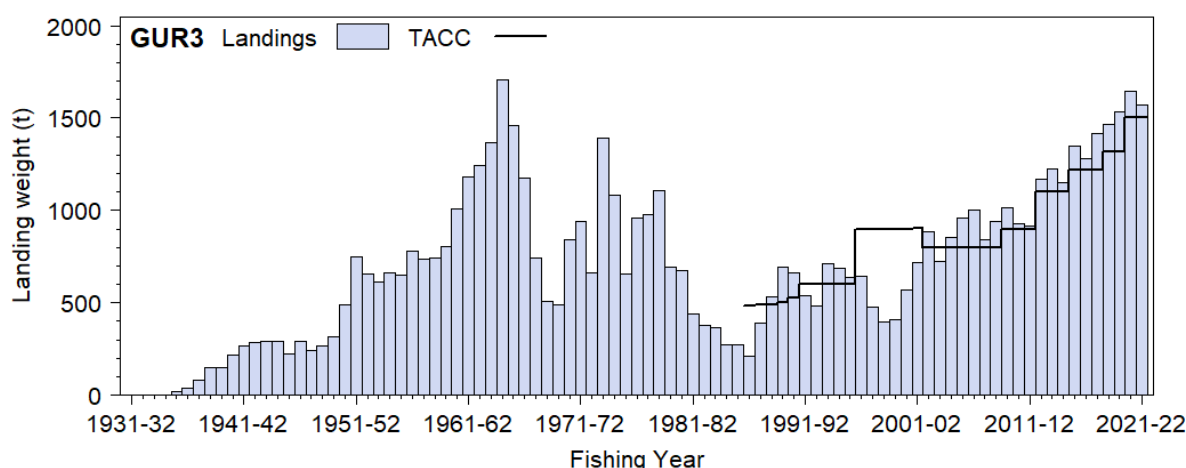


Figure 8: Reported commercial landings and TACCs for GUR 3 (South East Coast).

23. Commercial fishing stakeholder groups (Southern Inshore Fisheries, and Fisheries Inshore New Zealand) have noted that commercial fishers find it difficult to avoid catching red gurnard in GUR 3 and that its abundance has increased over the last several years, especially along the east coast of the South Island.

## 5.2 Customary Māori

24. Red gurnard is an important species for Māori customary, non-commercial fishing interests, by virtue of its wide distribution in shallow coastal waters. Under the *Fisheries (South Island Customary Fishing) Regulations 1999*, red gurnard (kumukumu, pūwhaiāu) has been reported as taken in small amounts from GUR 3, with approximately 800 kg recorded as harvested between 2009 and 2018. The small amount of customary reporting may reflect that tangata whenua are using recreational fishing regulations for their harvest.
25. The customary allowance for GUR 3 is currently set at three tonnes, based on customary reporting volumes (discussed above) and possible tangata whenua use of recreational regulations for harvesting red gurnard in the QMA. FNZ welcomes input from tangata whenua on levels of customary take of red gurnard in this area and seeks feedback on whether the current allowance sufficiently accounts for customary take of GUR 3.

## 5.3 Recreational

26. Red gurnard is a popular recreational fish species across New Zealand. The main recreational fishing method is rod and line, and the recreational daily bag limit for red gurnard in FMA 3 is 30 per person per day as part of the mixed species daily limit. A 25 cm minimum size is in place, alongside a 100 mm minimum net mesh size for set nets used to catch red gurnard. The recreational allowance for GUR 3 is currently set at six tonnes.
27. Based on the National Panel Survey of Marine Recreational Fishers (**NPS**) 2017/18, recreational catch of GUR 3 decreased between the 2011/12 and 2017/18 surveys (Table 3).<sup>4</sup>

**Table 3: Summary of the National Panel Survey of Marine Recreational Fishers results from GUR 3 for red gurnard.**  
Figures are all in tonnes.

Fish stock	2011/12 Estimated harvest	CV	2017/18 Estimated harvest	CV
GUR 3	2.01	± 1.24	1.7	± 0.7

28. The NPS is, however, a snapshot of fishing activity over a fishing year. 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.

## 5.4 Other sources of mortality caused by fishing

29. The allowance for other sources of mortality caused by fishing includes mortality associated with the requirement to return to the sea fish that are below the minimum legal size, fish escaping fishing gear, and illegal discarding.
30. In 2020, the then Minister of Fisheries decreased the 'other mortality' allowance for GUR 3 from a level equivalent to 20% of its TACC to a level equivalent to 7% of the TACC (from 264 tonnes to 105 tonnes). The decision noted the improvements in commercial fishing practices in FMA 3 and FMA 5 (e.g. use of lighter gear and larger mesh size).
31. There is no new information available to quantify all 'other mortality' to the stock caused by fishing for GUR 3. As such, FNZ proposes to retain the allowance for other mortality at a level equivalent to 7% of the TACC.

<sup>4</sup> Wynne-Jones et al. (2019) – [NPS 2017-18](#), Wynne-Jones et al. (2014) – [NPS 2011-12](#)

## 6 Treaty of Waitangi obligations

32. Section 5 of the *Fisheries Act 1996* requires 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.
33. 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 this section, 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

34. Section 12 (1)(b) of the *Fisheries Act 1996* 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 aquatic environment in the area concerned. In considering the views of tangata whenua, the Minister is required to have particular regard to kaitiakitanga.<sup>5</sup>
35. 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. 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.<sup>6</sup>
36. Te Waka a Māui me Ōna Toka Iwi Forum is Te Waipounamu (South Island) Iwi Fisheries Forum - it includes all nine tangata whenua iwi of Te Waipounamu: 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*.
37. At a hui held in March 2023, FNZ discussed the October sustainability round generally with the Forum. At that time, South Island stocks to proceed to review were not finalised as trawl survey biomass estimates were not available to inform options for GUR 3 for forum member's input. The options presented in this paper will, therefore, be discussed further with Te Waka a Māui me Ōna Toka Iwi Forum hui in July 2023. In response to the forum's input, further options may be presented to the Minister for consideration.

### 6.2 Kaitiakitanga

38. Information provided by forums, and iwi views on the management of fisheries resources and fish stocks, as set out in Iwi Fisheries Plans, are ways that tangata whenua can exercise kaitiakitanga in respect of fish stocks.
39. Kumukumu (red gurnard) is identified as a taonga species in the Te Waipounamu Iwi Forum Fisheries Plan. The Forum Fisheries Plan contains objectives to support and provide for the interests of South Island iwi, including the following which are relevant to the options proposed in this paper:

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<sup>5</sup> The Fisheries Act defines Kaitiakitanga to mean "the exercise of guardianship; and, in relation to any fisheries resources, includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate tangata whenua in accordance with tikanga Māori", where tikanga Māori refers to Māori customary values and practices.

<sup>6</sup> However, FNZ also engages directly with Iwi (outside of Forums) on matters that affect their fisheries interests in their takiwa and consults with any affected Mandated Iwi Organisations and Iwi Governance Entities where needed.

- **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.

40. FNZ is seeking input from tangata whenua on how the proposed options for GUR 3 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 this stock.

### 6.3 Mātaimai reserves and other customary management tools

41. Under the *Fisheries (South Island Customary Fishing) Regulations 1999* and the *Fisheries Act 1996*, tangata whenua can manage their fisheries in a way that best fits their local practices. The following customary management areas are located within GUR 3 (Table 4).

**Table 4: Customary fisheries management areas within GUR 3.**

Name	Management type
Te Taumanu o Te Waka a Māui Oaro-Haumuri Akaroa Harbour East Otago	<b>Taiāpure</b> All types of fishing are permitted within a Taiāpure. The management committee can recommend regulations for commercial, recreational, and customary fishing.
Te Waha o te Marangai Mangamaunu Kahutara Oaro Tūtaeputaputa Lyttleton Harbour/Whakaraupo Rapaki Bay Koukourārata Te Kaio Ōpihi Extension Ōpihi Waitarakao Te Ahi Tarakihi Tuhawaiki Waihao Moeraki Otakou Puna-wai-Toriki (Hays Gap) Waitutu Oreti Motupohue Te Whaka a Te Wera Horomamae Pikomamaku Kaihuka	<b>Mātaimai reserve</b> Commercial fishing is not permitted within mātaimai reserves unless regulations state otherwise.

42. FNZ considers the options proposed in this paper will not impact, or be impacted by, the customary fisheries management areas in GUR 3. Commercial fishing is prohibited in the mātaimai listed above. There are no regulations relating to either red gurnard in taiāpure, or bylaws in any of the mātaimai. Customary fisheries management areas were primarily created for

the management of inshore rocky reef species such as pāua, blue cod, crayfish, and kina. As such, there is little overlap between these areas and red gurnard commercial fisheries.

## 7 Environmental principles - section 9 of the Act

43. The environmental principles that must be taken into account when considering sustainability measures for GUR 3 are as follows:
- associated or dependent species should be maintained above a level that ensures their long-term viability;
  - biological diversity of the aquatic environment should be maintained; and
  - habitats of particular significance for fisheries management should be protected.
44. It is important to note that in some cases FNZ has made assumptions about environmental interactions based on fisher-reported data that may not have been independently verified (for example by an onboard FNZ observer). Observer coverage in GUR 3 has averaged just over five percent in the past five fishing years based on event level data<sup>7</sup>, with observer effort prioritised to monitor protected species interactions in other fisheries considered to be of higher risk.
45. The rollout of onboard cameras<sup>8</sup> on commercial fishing vessels in GUR 3 will enhance FNZ's abilities to monitor environmental interactions in the fishery. It is expected that the independent information the cameras 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.
46. Of most relevance to GUR 3, cameras are scheduled to be installed on, and transmitting footage from, all inshore trawl vessels operating in GUR 3 before the start of the 2023/24 fishing year.

### 7.1 Associated or dependent species – section 9(a) of the Act

#### 7.1.1 Marine mammals

47. Marine mammals are sometimes accidentally caught during commercial fishing. Commercial fishers must file daily reports about what they have caught. FNZ is now releasing these data quarterly (commencing from the 2019/20 fishing year). You can view this information on our [webpage](#). It is important to note that in some cases FNZ has made assumptions about the likely fishing method.
48. In general, trawl fisheries have been assessed as posing a substantially lesser risk to dolphins than commercial set-net 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 GUR 3, is largely managed under the current trawl restrictions. In 2022, two Hector's dolphin deaths were recorded in FMA 3 following capture in an inshore bottom trawl net. Prior to this, between 2002/03 and 2019/20, there were no observed captures of Hector's dolphins in inshore trawl fisheries in the East Coast South Island area.
49. Restrictions are in place surrounding the use of trawl gear outside two nautical miles from the coast between Cape Jackson in the Marlborough Sounds and Slope Point in the Catlins: only trawl nets with defined low headline heights<sup>9</sup> may be used. Existing restrictions along the east coast of the South Island are presented in Table 5 below.

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<sup>7</sup> 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.

<sup>8</sup> [On-board cameras for commercial fishing vessels](#). Ministry for Primary Industries

<sup>9</sup> The distance from the net's groundrope to the headline.

**Table 5: Existing trawl restrictions along the east coast South Island.**

East coast South Island	Method	Existing measures
Pegasus Bay	Trawl	Low headline height required on trawl vessels operating within 2 nm of shore.
Banks Peninsula to Timaru	Trawl	Low headline height required on trawl vessels operating within 2 nm of shore.

50. New Zealand sea lions, New Zealand fur seals, common dolphins, and other marine mammals inhabit the marine environment where red gurnard are caught in GUR 3. These species periodically interact with trawl vessels. Between 2020/21 and 2021/22, 21 New Zealand fur seal deaths were reported by commercial fishers or observed by FNZ observers in the ECSI inshore waters of GUR 3 where red gurnard is predominantly caught (see Figure 2). Other than the Hector's dolphin deaths discussed above, there were no observed captures of other marine mammals or cetaceans by small vessels in trawl fisheries in the east coast South Island area during this period. However, observer coverage in GUR 3 has averaged just over five percent in the past five fishing years based on event level data, so the total number of interactions is uncertain.
51. Overall, FNZ considers the number of incidental marine mammal captures is unlikely to increase under the options proposed in this paper, as it is not expected that the amount of trawling or set-netting will increase significantly.

### 7.1.2 Seabirds

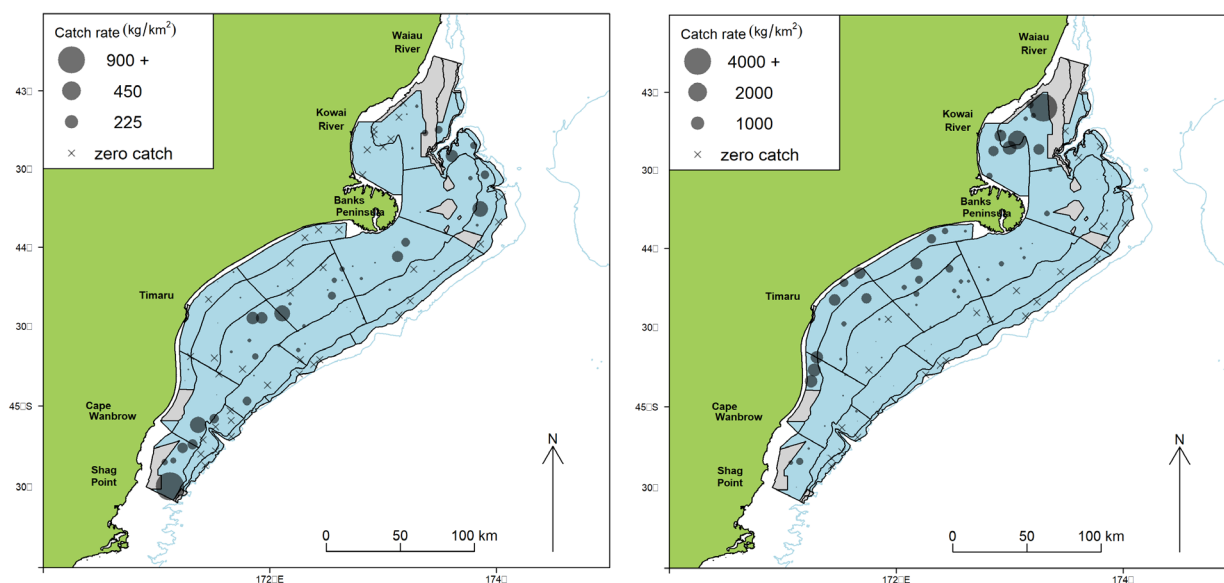
52. Seabird interactions with New Zealand's commercial fisheries are managed under the [National Plan of Action \(NPOA\) - Seabirds 2020](#). The *NPOA-Seabirds*, with its focus on education and ensuring fishers take all practicable steps to minimise risk to seabirds, will drive significant changes in fisher behaviour and help to ensure that fishing does not adversely impact the health of seabird populations.
53. FNZ and the fishing industry have worked collaboratively for over a decade, more recently with 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 onboard 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 GUR 3 trawl fishery have, and follow, one.
54. Within the GUR 3 area, red gurnard is predominantly caught in FMAs 3 and 5. Focusing on trawlers operating in these FMAs, seabird interactions reported by commercial fishers over the last three fishing years (2019/20, 2020/21 and 2021/22) were 401 (264 deaths, 137 released alive), 269 (190 deaths, 79 released alive) and 188 (130 deaths, 58 released alive), respectively. It should be noted that these figures are representative of trawling activity throughout the entirety of both FMAs – the majority of which is beyond the continental shelf where red gurnard is predominantly caught (see Figure 2). As discussed above, only a small proportion of trawls are observed by FNZ observers.
55. Overall, FNZ considers the number of incidental seabird captures is unlikely to increase under the options presented, as it is not expected that trawling or set-net activity will increase significantly.

### 7.1.3 Fish bycatch

56. Fish and invertebrate bycatch information in the mixed-species trawl fishery is primarily from trawl surveys. Trawl surveys along the east coast of the South Island 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.
57. In 2019, FNZ took a multi-species approach to reviewing those stocks (where appropriate) caught together in FMA 3. At that time, analysis of the interdependencies between the stocks identified three tiers of interdependency (where target catch influences bycatch):

- blue moki and red gurnard;
- leatherjacket and red gurnard; and
- red gurnard and rig.

58. Invertebrate species most commonly caught as bycatch by trawlers in FMAs 3 and 5 – where red gurnard is predominantly caught in GUR 3 – include bryozoans and true corals. Over the last three complete fishing years (2019/20, 2020/21, 2021/22), commercial fishers reported catching 185 kg, 1,048 kg and 739 kg, respectively, of invertebrate species. It should be noted that these figures are representative of trawling activity throughout the entirety of both FMAs – the majority of which is beyond the continental shelf where red gurnard is predominantly caught (see Figure 2). The volume of invertebrate species bycatch is unlikely to increase under the options presented, as it is not expected that trawling activity will increase significantly.
59. Trawlers rarely interact with protected fish species in FMAs 3 and 5. Over the last three complete fishing years (2019/20, 2020/21, 2021/22), commercial fishers reported 11 (three deaths, eight released alive), one (dead) and one (released alive) interactions, respectively, with basking and white pointer sharks. The number of protected fish species' captures is unlikely to increase under the options presented, as it is not expected that trawling activity will increase significantly.
60. Increases to catch limits for GUR 3 will increase the ability of fishers to target this species and may allow them to avoid bycatch of other, less abundant species with overlapping depth profiles. This is of particular importance for east coast tarakihi, as it is currently undergoing a rebuild due to low abundance. While tarakihi has a wide depth profile that incorporates many species, including red gurnard, the distribution plots below indicate that red gurnard is taken inshore of the main tarakihi distributions (Figure 9). Increasing the TACC for GUR 3 will allow fishers to move into shallower waters, away from traditional tarakihi habitat and undertake more targeted fishing.



**Figure 9: 2022 ECSI trawl survey catch rates (kg km<sup>-2</sup>) of tarakihi (left) and red gurnard (right). The legend indicates the circle size that corresponds to catch rates; on the figure, circle size is continuous and proportional to the catch rate. Crosses indicate no catch of the given species at that station. Grey areas are foul ground. The depth contour is 500 m.**

## 7.2 Biological diversity of the aquatic environment – section 9(b) of the Act

61. Bottom trawling can damage the marine environment, particularly when it occurs in benthic<sup>10</sup> habitats supporting high biodiversity. However, the proposed increase to the catch limit is modest and is not likely to produce a significant increase in trawl effort, as it reflects increased

<sup>10</sup> Relating to the seafloor.



fish abundance and CPUE. Trawling in this fishery is also typically confined to areas that have been consistently fished over time (i.e. not areas of high biodiversity).

62. Concerns have been raised about catch being taken in “hay paddocks” on the southeastern continental shelf. These are polychaete worm beds that are biologically sensitive, habitat-forming areas which may be vulnerable to disturbance by commercial fishing. As noted above, FNZ does not expect an increase in the amount or extent of bottom trawling as a result of the proposed increase to the catch limit. If an increase in fishing activity does occur, we will examine appropriate measures to manage any issues that may arise.
63. Aquatic environment and biodiversity research has characterised both New Zealand's benthic environment and the level of benthic impact from fishing activity.<sup>11</sup> The environmental impacts of fishing are summarised annually by FNZ, and FNZ will continue to monitor the bottom trawl footprint of fisheries.
64. Overall, FNZ considers the proposed increase to the catch limit reflects increased red gurnard abundance and CPUE and is, therefore, unlikely to drive a meaningful increase in bottom trawling activity with associated impacts on benthic habitats.<sup>12</sup>

### 7.3 Habitats of particular significance for fisheries management – section 9(c) of the Act

65. Red gurnard is one of the most frequently encountered finfish species in New Zealand inshore waters, exhibiting wide latitudinal and depth range. Red gurnard is broadly distributed in FMAs 3 and 5 and there is limited information regarding what specific areas of habitat are of particular significance to the stocks.
66. FNZ is progressing towards ecosystem-based management. This progress is supported by a number of initiatives, including our proposed draft guidelines for identifying a habitat of particular significance for fisheries management. The guidelines will inform habitat identification and provide greater transparency on our fisheries management advice. Public consultation on the guidelines closed in November 2022; we are currently considering feedback received and revising the guidelines.<sup>13</sup>
67. There is no confirmed habitat of particular significance for fisheries management for GUR 3. Information that may inform our understanding of potential habitats of particular significance to GUR 3 is discussed in Table 6 below.

**Table 6: Summary of information on potential habitats of particular significance for fisheries management for GUR 3.**

Fish stock	Red gurnard - GUR 3
Habitat	Spawning areas are widespread throughout much of New Zealand, including in GUR 3. Running ripe red gurnard are found throughout the fishery. However, general areas where spawning occurs include the Canterbury Bight and Pegasus Bay, where there are also high catches of juveniles. This suggests bays, more generally, may serve as spawning and nursery areas which, in turn, might supply east coast South Island waters. Egg and larval development occurs in surface waters.
Attributes of habitat	Spawning areas are more common in shallow coastal waters (inner and central continental shelf) over muddy or sandy bottoms. <b>Juveniles:</b> Information suggests juveniles prefer rough or weed covered ground in shallow embayments.

<sup>11</sup> Fisheries New Zealand (2021): [Aquatic Environment and Biodiversity Annual Review](#).

<sup>12</sup> Further information on bottom trawling is available at <https://www.mpi.govt.nz/fishing-aquaculture/sustainable-fisheries/strengthening-fisheries-management/bottom-trawling/>.

<sup>13</sup> More information is available at <https://www.mpi.govt.nz/consultations/guidance-for-identifying-a-habitat-of-particular-significance-for-fisheries-management/>.



Fish stock	Red gurnard - GUR 3
Reasons for particular significance	<ul style="list-style-type: none"> <li>Successful spawning and development through juvenile stages is critical to supporting the productivity of the stock and ensuring juveniles recruit into the fishery.</li> <li>Juvenile habitats are likely to provide shelter and protection from predation and harvesting, as well as providing suitable food while growth and development proceeds.</li> </ul>
Risks/threats	<ul style="list-style-type: none"> <li>Changes in water temperature and water circulation could impact spawning and egg/larval development.</li> <li>Bottom-contact fishing methods impacting inshore biogenic habitats.</li> <li>Land-based impacts, for example sedimentation on habitats with benthic structure and aquatic plants that provide juvenile habitat.</li> </ul>
Existing protection measures	Although not specific to GUR 3, within the GUR 3 management area there are several habitats that may have particular significance to other species, and are currently protected by regulatory and non-regulatory measures (voluntary).
Evidence	<ul style="list-style-type: none"> <li>Morrison, M.A.; Jones, E.G.; Parsons, D.P.; Grant, C.M. (2014). Habitats and areas of particular significance for coastal finfish fisheries management in New Zealand: A review of concepts and life history knowledge, and suggestions for future research. New Zealand Aquatic Environment and Biodiversity Report No. 125. 202 p.</li> <li>Fisheries New Zealand (2022). Fisheries Assessment Plenary, May 2022: stock assessments and stock status. Compiled by the Fisheries Science Team, Fisheries New Zealand, Wellington, New Zealand. 1886 p.</li> </ul>
Confidence	<ul style="list-style-type: none"> <li>Medium - Some empirical work exists but it is associated with high uncertainty or expert has some personal knowledge</li> </ul>

68. While the impacts of climate change on red gurnard stocks remain uncertain, documented increases in sea surface temperature off the east coast of the South Island (NIWA, 2022) correspond with an increase in recruitment in GUR 3 since 2007. This suggests changes in prevailing oceanographic conditions may have contributed to the increased productivity of the stock from the mid-2000s. Continued monitoring of the impact of increasing sea surface temperature is essential, as there is likely an upper limit to the level of warming or current changes that are beneficial to red gurnard.
69. FNZ is working with councils to consider and mitigate land-based impacts (e.g. sedimentation, nutrient runoff) on marine habitats through coastal planning processes. Furthermore, the *National Policy Statement on Freshwater Management and the National Environmental Standards for Freshwater* (which came into effect in September 2020) aims to stop further degradation, show material improvements within five years, and restore our waterways to health within a generation.

## 8 Considerations for setting sustainability measures under section 11 of the Act

70. Section 11 of the *Fisheries Act 1996* sets out various matters that the Minister must take into account or have regard to when setting or varying sustainability measures (such as the TAC change proposed as part of this paper). These include:
- any effects of fishing on any stock and the aquatic environment; and
  - any existing controls under the Act that apply to the stock or area concerned; and
  - the natural variability of the stock concerned; and
  - any relevant planning instruments, strategies, or services.<sup>14</sup>

### 8.1 Effects of fishing on any stock and the aquatic environment

71. In setting or varying a sustainability measure, the Minister must take into account any effects of fishing on any stock and the aquatic environment.

<sup>14</sup> Sections 11 (2) and (2A).

72. “Effect” is defined widely in the Act.<sup>15</sup> The broader effects of removing red gurnard from the ecosystem, as well as the more direct effects of bottom trawling must be taken into account.
73. All information with regard to the effects of bottom trawling for GUR 3 on stocks and the aquatic environment is discussed above under ‘Environmental principles’, and below under ‘Options and analysis’.

## 8.2 Existing controls that apply to the stock or area

74. In setting or varying a sustainability measure, the Minister must take into account any existing controls under the *Fisheries Act 1996* (including rules and regulations made under the Act (s 2(1A)) that apply to the stock when setting or varying the TAC.
75. Along with the catch limits and allowances set under the TAC, there are three management controls in place regarding recreational take of red gurnard in GUR 3: a minimum legal size (MLS), a maximum daily bag limit (as part of the mixed species daily limit), and a minimum net mesh size for red gurnard caught using set-nets (see section 5.3).
76. Spatial restrictions prevent commercial fishing (including for red gurnard) in customary areas (see Table 4).

## 8.3 The natural variability of the stock

77. In setting or varying a sustainability measure, the Minister must take into account the natural variability of the stock.
78. Results from the ECSI trawl survey series indicate red gurnard exhibits natural variability in abundance. With regards to GUR 3, the 2022 stock assessment estimates that abundance has increased considerably from the late 2000s. FNZ will continue to monitor the fishery, including via the ECSI trawl survey and review of CPUE indices.

## 8.4 Relevant statements, plans, strategies, provisions, and documents – section 11(2) of the Act

79. In setting or varying the TAC of this stock, the Minister must have regard to relevant statements, plans, strategies, provisions, and planning documents that apply to the coastal marine area. The following plans and strategies apply to GUR 3.

### 8.4.1 Regional Plans – section 11(2)(a)

80. Under the *Resource Management Act 1991*, there are several regional plans in place within GUR 3 to address the cumulative effects of activities in the coastal marine area, and the adverse impacts from land-based activities on the marine environment. Councils with responsibilities in GUR 3 include Environment Canterbury, Otago Regional Council, Environment Southland, and the Chatham Islands Council.
81. Fishers are subject to the rules in the plans (for example, small-scale restrictions on fishing methods in Fiordland). FNZ considers that the small scale of the restrictions in relation to the large area of GUR 3 means these rules do not, in general, stop fishers taking their catch from other areas within GUR 3.
82. FNZ has reviewed these documents and the provisions that might be considered relevant can be found in a separate document titled *Regional Plan Provisions and Policy Statements*, accessible at <https://www.mpi.govt.nz/dmsdocument/57115>. FNZ considers that the proposed options in this paper are consistent with the objectives of these relevant regional plans.

<sup>15</sup> Section 2(1) of the Act defines “effect” to mean the direct or indirect effect of fishing, and includes any positive, adverse, temporary, permanent, past, present, or future effect. It also includes any cumulative effect, regardless of the scale, intensity, duration, or frequency of the effect, and includes potential effects.

## 8.4.2 Harvest Strategy Standard

83. As GUR 3 is very likely (>90%) to be above the target level of 35% of  $B_0$ , section 13(2)(c) of the Act provides for the setting of a TAC for GUR 3, and guidance is provided by the [Harvest Strategy Standard for New Zealand Fisheries \(HSS\)](#).
84. The High Court has held that the HSS is a mandatory relevant consideration that the Minister must have regard to when setting a TAC under section 13 of the Act.
85. The HSS is a policy statement of best practice in relation to setting fishery and stock targets and limits for fish stocks in New Zealand's QMS. It is intended to provide guidance on how fisheries law will be applied in practice, by establishing a consistent and transparent framework for decision-making to achieve the objective of providing for utilisation of New Zealand's QMS species while ensuring sustainability.
86. The HSS outlines the Ministry's approach to relevant sections of the Act and forms a core input to the Ministry's advice to the Minister on the management of fisheries. The HSS defines a hard limit as a biomass limit below which fisheries should be considered for closure and a soft limit as a biomass limit below which the requirement for a formal time-constrained rebuilding plan is triggered.
87. In the case of GUR 3, there are no alternative management targets. Therefore, the HSS default limits apply to this stock. Under the HSS, the default management target is 35%  $B_0$  (unfished biomass), the soft limit is 20%  $B_0$ , and the hard limit is 10%  $B_0$ .

## 8.5 Relevant services or fisheries plans – section 11(2A) of the Act

88. Before setting or varying any sustainability measure (such as the TAC), the Minister must take into account any conservation or fisheries services, and any relevant fisheries plans approved under section 11(2A) of the Act.

### 8.5.1 National Inshore Finfish Fisheries Plan

89. The [National Inshore Finfish Fisheries Plan \(the Plan\)](#) provides guidance on management objectives and strategies for finfish species, including red gurnard. The Plan will guide the operational management of inshore finfish fisheries including GUR 3 for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.
90. Stocks are grouped within the Plan, with management approaches and objectives tailored accordingly for each group.
91. GUR 3 falls under 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 (i.e., a partial quantitative assessment comparing against trends over time). However, given the importance of GUR 3 in the east coast South Island multispecies trawl fishery, the first fully quantitative stock assessment of GUR 3 was completed in May 2022, providing comprehensive information for management of the stock.

## 8.6 Other plans and strategies

92. The following plans and strategies are not mandatory considerations under section 11 of the Act, but they may be considered relevant to this review.

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

93. [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 several objectives across three timeframes. The most relevant to setting sustainability measures for GUR 3 are objectives 10 and 12:

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

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

94. FNZ is working with the Department of Conservation and other agencies on implementation of the strategy. As part of that work we are progressing to a more integrated ecosystem-based approach to managing oceans and fisheries. In that context, this review contains information on potential biodiversity impacts, ecosystem function and habitat protection associated with adjustments to sustainability measures (see Environmental principles section above).

## 9 Options and analysis

95. There are no alternative management targets for GUR 3, therefore, the HSS default target applies to this stock. As GUR 3 is very likely (>90%) to be above the target level of 35% of  $B_0$ , the options provided below are being considered under section 13(2)(c) of the Act.

### 9.1 Option 1 – *status quo*

TAC: 1,695 t	TACC: 1,575 t	Customary: 3 t	Recreational: 6 t	Other mortality: 111 t
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#### 9.1.1 TAC

96. Option 1 is to retain the current TAC and other settings (the *status quo*). This option notes the uncertainty associated with the ECSI trawl survey biomass estimates (including a decrease in red gurnard pre-recruited biomass – see Figure 7), that current fishing effort is high relative to the commercial catch data time-series which dates from the 1960s (Figure 7), and that a TAC increase of 81 tonnes has already been implemented on the basis of the 2022 stock assessment.

#### 9.1.2 Allowances

97. As noted in Section 4, the customary allowance for GUR 3 is currently set at three tonnes, based on available information. The small amount of customary reporting may reflect that tangata whenua are using recreational fishing regulations for their harvest. The recreational allowance for GUR 3 is currently set at six tonnes, based on available information.
98. Also as noted in Section 4, the allowance for other sources of mortality caused by fishing equates to seven percent of the TACC – based on a 2020 decision by the then Minister of Fisheries. There is no new information available to quantify all other mortality to the stock caused by fishing for GUR 3. As such, FNZ proposes to retain the allowance for other mortality at a level equivalent to seven percent of the TACC.

#### 9.1.3 TACC

99. The *status quo* does not provide for additional utilisation opportunity and will constrain commercial catch given increasing abundance of GUR 3, as reflected in the 2022 stock assessment and increasing CPUE indices. This may potentially constrain the catch of other species caught with red gurnard, given the difficulty fishers are experiencing avoiding this species.

### 9.2 Option 2

TAC: 1,779 t (↑ 84 t)	TACC: 1,654 t (↑ 79 t)	Customary: 3 t –	Recreational: 6 t –	Other mortality: 116 t (↑ 5 t)
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### 9.2.1 TAC

100. Option 2 increases the TAC by 84 tonnes, the TACC by 79 tonnes and the allowance for other mortality caused by fishing by 5 tonnes. No change is proposed for customary and recreational allowances. This considers both the results of the 2022 stock assessment for GUR 3, preliminary biomass estimates from the ECSI trawl survey, and increasing trends in CPUE indices.
101. This option takes into account that the approach applied in last year's 2022/23 *Review of sustainability measures for red gurnard (GUR 3)*<sup>16</sup>, was cautious and that FNZ signalled that the TAC would be reviewed again following results from the 2022 ECSI trawl survey. Consecutive, modest increases to the TAC in 2022/23 and 2023/24 offer a precautionary approach to a utilisation opportunity at a time of high abundance of red gurnard.
102. The proposed option is considered under section 13(2)(c) of the Act. This specifies that the TAC should enable the level of any stock whose current level is above that which can produce the MSY to be altered in a way and at a rate that will result in the stock moving towards or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks.
103. Although the June 2022 ECSI trawl survey estimates pre-recruited red gurnard are declining, suggesting that recruitment to the fishery will decline in the short term, ECSI trawl surveys are conducted every second year, enabling FNZ to react responsively should the stock decline below the target.
104. As discussed in Section 7.1, the increase in TAC is not expected to have an impact on the long-term viability of other interdependent stocks, or on those species with which red gurnard interact as predators and prey.

### 9.2.2 Allowances

105. Option 2 assumes that with an increase in abundance, the success and levels of harvest of customary and recreational fishing will also likely increase. However, given recreational and customary catch estimates are below the limits, based on customary returns and NPS 2017/18 estimates, no increases are proposed.
106. As noted above, there is no new information available to quantify all other mortality to the stock caused by fishing for GUR 3. As such, FNZ proposes to retain the allowance for other mortality at a level equivalent to seven percent of the TACC.

### 9.2.3 TACC

107. This option provides benefits in terms of the overall commercial value from GUR 3, and increased utilisation opportunity for commercial fishers in line with the increase in abundance. This applies not only in relation to GUR 3, but also in relation to catch of other stocks caught together with red gurnard, such as rig, in the ECSI multispecies trawl fishery.

## 10 Economic considerations

108. The Fisheries Management Area 3 (FMA 3) inshore mixed species trawl fishery, in which red gurnard is predominately caught, supports a number of associated people and businesses. This includes but is not limited to:
  - Quota holders
  - Commercial fishers
  - Seafood processing facilities and licensed fish receivers.
109. To give a sense of scale and distribution for GUR 3, based on the 2021/22 fishing year, 64% of GUR 3 quota was owned by four entities, and the remaining 36% of quota was owned by 41

<sup>16</sup> <https://www.mpi.govt.nz/dmsdocument/51850-Review-of-Sustainability-Measures-for-Red-Gurnard-GUR-3-for-202223-Discussion-document>

entities. As at the end of the 2021/22 fishing year, there were 63 commercial entities holding ACE, down from 75 entities the previous year. Thirty-nine percent of ACE was held by four entities, and the remaining 61% was held by 59 entities.

110. Under Option 2 in this paper, increasing the the maximum commercial landed catch under the TACC (1,575 tonnes) to 1,654 tonnes equates to a five percent increase. Based on the 2023/24 port price of \$2.87/kg, this would generate a further \$227,000 per year in commercial fishing revenue potential. 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.

## 11 Deemed value rates

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

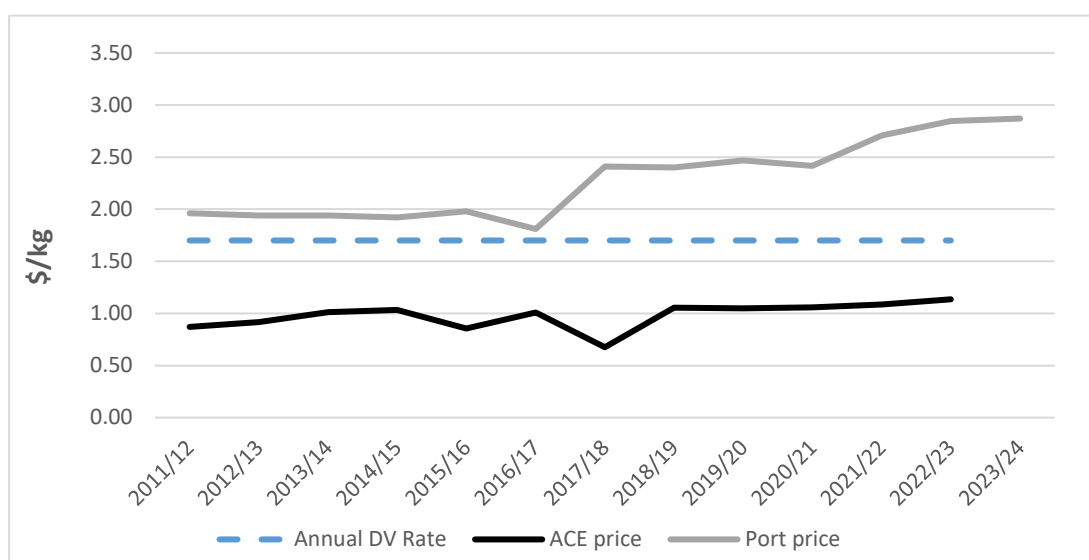
112. The [Deemed Value Guidelines](#) set out the operational policy FNZ uses to inform the development of advice to the Minister on the setting of deemed values.

113. The deemed value rates for GUR 3 are shown in Table 7.

**Table 7: Current deemed value rates (\$/kg) for GUR 3.**

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 3	1.53	1.70	2.04	2.38	2.72	3.06	3.40

114. Figure 10 below shows trends in the port price, average annual ACE transfer price, and annual deemed value rate for GUR 3 since 2011-12.



**Figure 10: Summary of port price, average annual ACE transfer price, and annual deemed value rate information for GUR 3 since 2011-12. Note that the average ACE transfer price for 2022-23 is based on a smaller sample size given that the fishing year is not yet complete.**

115. The average price paid by fishers during the 2021/22 fishing year for one kilogram of GUR 3 ACE was \$1.09. The most recent port price (2023/24) for GUR 3 is \$2.87/kg. The annual deemed value is set appropriately between these two figures (Table 7).

116. The current deemed value rates for GUR 3 are set slightly above the average ACE price and FNZ is satisfied that the current deemed values are consistent with section 75(2)(a) of the Fisheries Act in that they provide sufficient incentive for fishers to balance their catch with ACE. FNZ is therefore not recommending any changes to deemed value rates for GUR 3 at this time.
117. FNZ acknowledges that an increase in TACC may lead to subsequent changes in fishing behaviour and the ACE market may result in the need for the deemed value to be re-evaluated in the future.
118. FNZ welcomes any feedback on these deemed value settings.

## 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?
119. 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

120. FNZ invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 17 July 2023.
121. Please see the FNZ sustainability consultation webpage (<https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-for-fisheries-october-2023-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](mailto:FMSubmissions@mpi.govt.nz).

## 14 Legal basis for managing fisheries in New Zealand

122. 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/57112> for more information.

## 15 Referenced reports

Department of Conservation and Ministry of Fisheries (2011). Coastal marine habitats and marine protected areas in the New Zealand Territorial Sea: a broad scale gap analysis. Accessible at: [Coastal marine habitats and marine protected areas in the New Zealand Territorial Sea : a broad scale gap analysis \(doc.govt.nz\)](#)

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- Department of Conservation and Fisheries New Zealand (2019). Hector's and Māui Dolphin Threat Management Plan. Latest review accessible at: <https://www.mpi.govt.nz/consultations/hectors-and-maui-dolphins-threat-management-plan-review/>
- Fisheries New Zealand (2022). Aquatic Environment and Biodiversity Annual Review 2021. Compiled by the Aquatic Environment Team, Fisheries Science and Information, Fisheries New Zealand, Wellington New Zealand. 779 p. Accessible at: <https://www.mpi.govt.nz/science/fisheries-research-and-science/about-our-fisheries-research/aquatic-environment-and-biodiversity-annual-review-aebar/>
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- NIWA (2022). Aotearoa New Zealand Climate Summary: Summer 2021-22. 4 March 2022. [https://niwa.co.nz/sites/niwa.co.nz/files/Climate\\_Summary\\_Summer\\_Final.pdf](https://niwa.co.nz/sites/niwa.co.nz/files/Climate_Summary_Summer_Final.pdf)
- Wynne-Jones, J.; Gray, A.; Heinemann, A.; Hill, L.; Walton, L. (2019). National Panel Survey of Marine Recreational Fishers 2017-2018. New Zealand Fisheries Assessment Report 2019/24. 104p. Accessible at: <https://www.mpi.govt.nz/dmsdocument/36792-far-201924-national-panel-survey-of-marine-recreational-fishers-201718>
- Wynne-Jones, J; Gray, A; Hill, L; Heinemann, A (2014) National Panel Survey of Marine Recreational Fishers 2011–12: Harvest Estimates. *New Zealand Fisheries Assessment Report 2014/67*. 139 p. Accessible at <https://www.mpi.govt.nz/dmsdocument/4719-FAR-201467-National-Panel-Survey-Of-Marine-Recreational-Fishers-201112-Harvest-Estimates>