



Fisheries New Zealand

Tini a Tangaroa

Review of Sustainability Measures for Red gurnard (GUR 1) for 2021/22

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1 Stock being reviewed

Red gurnard (GUR 1) – East and West Coasts of northern North Island

Chelidonichthys kumu, gurnard, Kumukumu

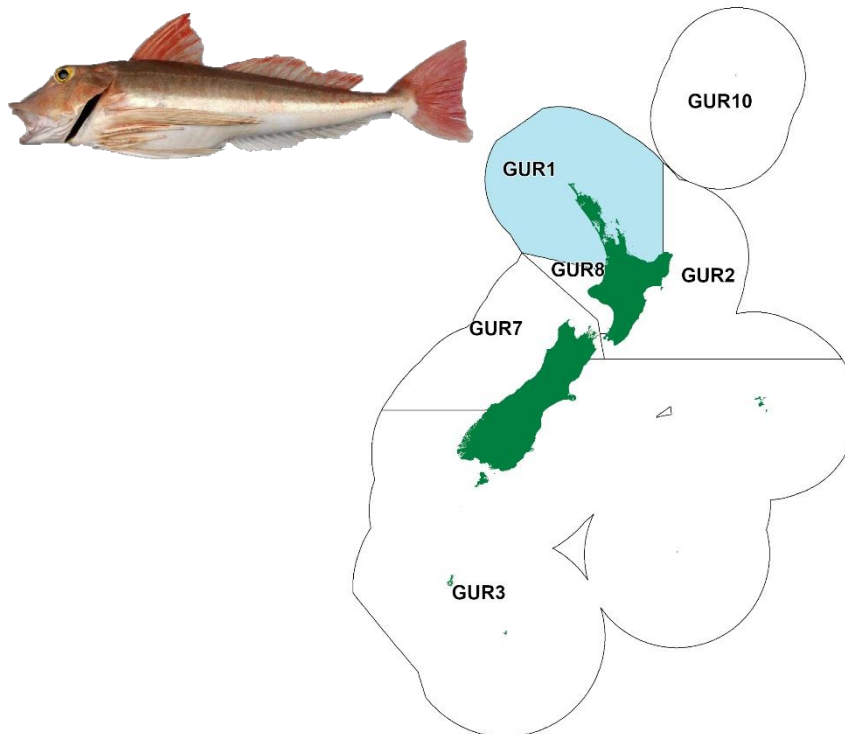


Figure 1: Quota Management Areas (QMAs) for red gurnard, with GUR 1 highlighted.

2 Summary

1. Fisheries New Zealand is reviewing sustainability measures for red gurnard in GUR 1 for the 1 October 2021 fishing year (Figure 1).
2. There is currently no Total Allowable Catch (TAC) set for GUR 1 and allowances for customary and recreational take have not been set. There is also no allowance for other sources of mortality caused by fishing, although, as a large portion of red gurnard catch is taken by bottom trawl, the magnitude of this mortality could be significant.
3. The review of GUR 1 addresses a potential sustainability concern with the current management settings.
4. The sustainability of the full Total Allowable Commercial Catch (TACC) is unknown, as there is no estimate of biomass nor Maximum Sustainable Yield (MSY) for GUR 1. The TACC could pose a sustainability risk if fully caught, particularly given the variability in red gurnard recruitment.
5. Since its introduction to the Quota Management System (QMS) in 1986, the TACC for GUR 1 has always been under caught. GUR 1 landings averaged about 50% of the TACC per annum between 1986 and 2015, but a slight decline in landings more recently has seen this figure drop to 35% between 2016 and 2020. The reason for this decline is unknown.
6. Fisheries New Zealand is proposing that a TAC and allowances for recreational take, customary take, and other sources of mortality caused by fishing be set, and that the TACC be reduced to address the potential sustainability risk posed by the current settings.

7. The following options are proposed for GUR 1:

Option 1 is to set a TAC of 2,328 tonnes, to make an allowance of 100 tonnes for recreational take, 40 tonnes for customary take, and 143 tonnes for other sources of mortality caused by fishing, and to reduce the TACC to 2,045 tonnes.

Option 2 is to set a TAC of 1,317 tonnes and to set an allowance of 100 tonnes for recreational take, 40 tonnes for customary take, and 77 tonnes for other sources of mortality caused by fishing; and to reduce the TACC to 1,100 tonnes. This option reduces the potential sustainability risk associated with the current management settings and sets the TAC and TACC at levels that the best available information suggests are sustainable.

Option 3 is to set a TAC of 996 tonnes and to set an allowance of 100 tonnes for recreational take, 40 tonnes for customary take, and 56 tonnes for other sources of mortality caused by fishing; and to reduce the TACC to 800 tonnes. This option greatly reduces the potential sustainability risk associated with the current management settings and responds to the recent (post-CPUE update) decline in landings.

8. Fisheries New Zealand welcomes feedback and submissions on these options.

3 About the stock

3.1 Biology

9. Red gurnard are found in Australia (as far north as southern Queensland on the east coast and Shark Bay on the western coast), South Africa and Mozambique, and New Zealand. In New Zealand, they are widely distributed from Cape Reinga to Stewart Island.
10. The species occurs at depths of 20-180 m but are commonly found on sandy and muddy substrates in less than 60 m. Their diet comprises mainly of crustaceans, especially small crabs and shrimps.
11. Red gurnard is a fast growing, moderately short-lived species with a maximum age of 16 years. They reach sexual maturity at 2-3 years old at a length of about 23 cm. Due to their fast growth rate and short lifespan, variation in red gurnard recruitment tends to result in large fluctuations in stock biomass.
12. Red gurnard have a long spawning period which extends through spring and summer with a peak in early summer. Spawning grounds appear to be widespread, although perhaps localised over the inner and central shelf.

3.2 Fishery characteristics

13. By virtue of its wide distribution in harbours and shallow coastal waters, GUR 1 is a shared fishery that is important to commercial, recreational, and customary fishers. It is sometimes targeted but also caught as welcome bycatch by commercial fishers targeting trevally (TRE), snapper (SNA), John dory (JDO), and tarakihi (TAR).
14. GUR 1 is likely comprised of three biological stocks (West Coast, East Northland and Hauraki Gulf, and Bay of Plenty). This division is logical for management purposes because the commercial fisheries that catch red gurnard in these three regions largely act independently of one another, and several other species taken by the same gear in the same area are monitored using these same sub-stock boundaries.
15. Each of these three GUR 1 sub-stocks are monitored and assessed using standardised catch per unit effort (CPUE) indices from their respective bottom trawl fisheries targeting GUR, SNA, TRE, TAR, or JDO.
16. Recreational fishers in GUR 1 may take up to 20 red gurnard under the combined daily bag limit of 20 finfish. The minimum legal size is 25 cm. There is no commercial minimum legal size.

4 Quota Management System

17. GUR 1 was introduced into the QMS in 1986. The 1986 TACC of 2,010 tonnes was based on the 1983 landings. Between 1986 and 1990, the TACC was gradually increased to a TACC of 2,284 tonnes. Minor adjustments were made to the TACC in 1994 and again in 2010, when the TACC reached its current setting of 2,288 tonnes.
18. For more information about the QMS go to <https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>.

5 Legal basis for managing fisheries in New Zealand

19. The Fisheries Act 1996 provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* at <https://www.mpi.govt.nz/dmsdocument/45235> for more information.

6 Treaty of Waitangi obligations

6.1 Input and participation of tangata whenua

20. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Each Iwi Fisheries Forum can develop an Iwi Fisheries Forum Plan that describes how the iwi in the Forum exercise kaitiakitanga over the fisheries of importance to them, and their objectives for the management of their interest in fisheries. Particular regard will be given to kaitiakitanga when making sustainability decisions.
21. Iwi Fisheries Forums may also be used as entities to consult iwi with an interest in fisheries. Ahead of the June 2021 Iwi Fisheries Forum meetings, a short document describing the GUR 1 stock, Fisheries New Zealand's rationale for review, and initial management proposals was circulated to the northern forums with a potential interest in GUR 1: Te Hiku o Te Ika, the Mid-North, Nga Hapu o Te Uru o Tainui, and Mai i ngā Kuri a Whārei ki Tihirau.
22. The Mid-North has expressed support for Fisheries New Zealand's review of GUR 1 and supported a decrease to the TACC.
23. Nga Hapu o Te Uru o Tainui expressed concern that the proposed decrease for GUR 1 alongside a large increase to SNA 8 could result in a deemed values issue, as the two stocks are frequently caught together. The forum also noted that kingfish and trevally are also caught in the west coast trawl fishery and should also be considered.
24. Members of Nga Hapu o Te Uru o Tainui also stated that the excess Annual Catch Entitlement (ACE) in GUR 1 served as a fallback option for fishers unable to source SNA ACE and several attributed the decline in GUR 1 landings to the [Hector's and Māui Dolphins Threat Management Plan](#) (TMP), saying management measures from the TMP have led to decreases in fishable area and the number of operators.
25. Fisheries New Zealand seeks further input and information on the proposed options for GUR 1 from tangata whenua during consultation and before final advice and recommendations are made.

6.2 Kaitiakitanga

26. Te Hiku o Te Ika, Mid-North, Hauraki, Nga Hapu o Te Uru o Tainui, and Mai i ngā Kuri a Whārei ki Tihirau Iwi Fisheries Forums all include members with rohe in the GUR 1 QMA. GUR 1 is listed as taonga species in the fisheries plans of Mai i ngā Kuri a Whārei ki Tihirau, Nga Hapu o

Te Uru oTainui, and Te Hiku o Te Ika. As newer forums, the Mid-North and Hauraki Collective have not yet developed fisheries plans for their respective forums.

27. This review seeks to address a potential sustainability risk with the current management settings. The options proposed are therefore consistent with management objectives of the Iwi Fisheries Forum Plans, which generally relate to active engagement with iwi and the maintenance of healthy and sustainable fisheries. Fisheries New Zealand seeks further input from iwi to help inform final advice on this review (Table 1).

Table 1: Relevant Iwi Fisheries Forum Plans.

Iwi Fisheries Forum	Relevant Fisheries Plan Management Objectives
Te Hiku o Te Ika	Fish stocks are healthy and support the social, cultural and economic prosperity of Te Hiku iwi and Hapu
Nga Hapu o Te Uru oTainui	The fishery and its environment are healthy and sustainable. Ngaa Hapuu o Te Uru kaitiaki are able to participate in and influence fisheries decision-making.
Mai i ngā Kuri a Whārei ki Tihirau	The fisheries environment is healthy and supports a sustainable fishery

28. Table 2 lists the customary fisheries areas that fall within the quota management area of GUR 1. As the options proposed in this paper aim to address a potential sustainability risk with GUR 1 by reducing the TACC, it is expected that these areas would benefit from the review.

Table 2: Customary Fisheries Areas in GUR 1.

Area	Management Type
Aotea Harbour	Mātaitai Reserve <i>Commercial fishing is not permitted within mātaitai reserves unless regulations state otherwise.</i>
Marokopa	
Raukokere	
Te Kopa o Rongokānapa	
Te Maunga o Mauao	
Te Puna	
Te Rae o Kohi	
Kawhia Aotea	Taiāpure <i>All types of fishing are permitted within a Taiāpure. The management committee can recommend regulations for commercial, recreational and customary fishing.</i>
Maketu	
Waikare Inlet	

29. To date, none of the customary fisheries areas listed in Table 2 have implemented regulations restricting customary or recreational take of GUR 1.

7 Relevant plans, strategies, statements and context

7.1 Draft National Inshore Finfish Fisheries Plan

30. GUR 1 will be managed under the [National Inshore Finfish Fisheries Plan](#) (the Plan) once finalised. The Plan outlines the management objectives and strategies for finfish fisheries for the next five years and was consulted on in early 2020.
31. 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.

32. GUR 1 has been assigned to Group 2, which recognises that Fisheries New Zealand intends to manage this stock to provide for moderate levels of use. Group 2 stocks are monitored with partial quantitative assessments compared against trends over time.

7.2 Hauraki Gulf Marine Park Act

33. The Hauraki Gulf Marine Park (HGMP) falls within the quota management area of GUR 1, making sections 7 and 8 of the [Hauraki Gulf Marine Park Act 2000](#) applicable to the management of this fishery. The [Overview of Legislative Requirements and Other Considerations](#) document provides more information on the applicability of the Hauraki Gulf Marine Park Act 2000.
34. As this review aims to address a potential sustainability risk with the GUR 1 management settings, Fisheries New Zealand considers that the proposed options are consistent with obligations under sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000.

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

35. [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 GUR 1 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.

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

8 Recent catch levels and trends

8.1 Commercial

37. The TACC for GUR 1 has never been caught. Average annual landings of GUR 1 were about 50% of the TACC between 1986 and 2015. Since the 2009 fishing year, landings have been declining. A more substantial decline between 2016 and 2020 has seen average annual landings drop to 35% of the TACC (Figure 2). The reason for this decline is not known.

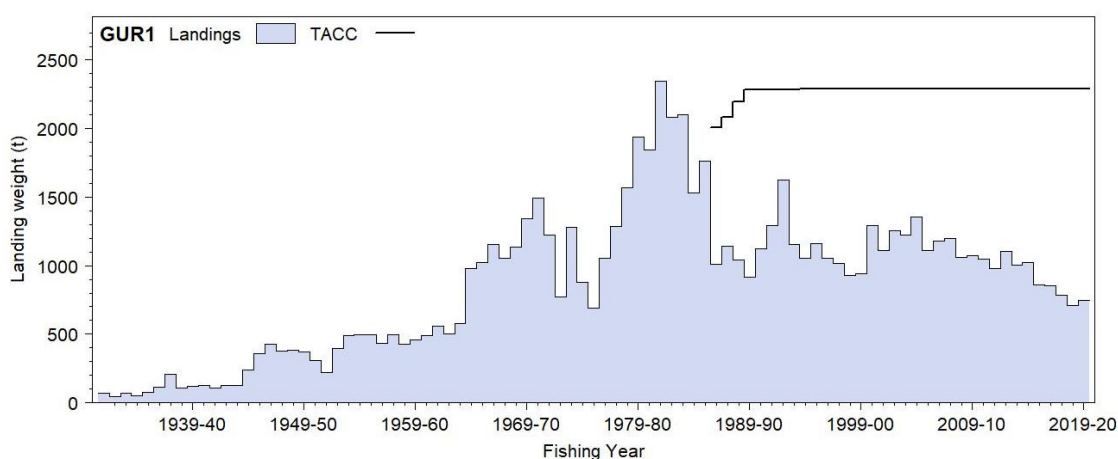


Figure 2: Commercial landings of GUR 1 against the TACC.

38. The majority (60-70%) of the total GUR 1 commercial catch is taken from the west coast sub-stock (GUR 1W). The remaining GUR 1 commercial catch is usually split fairly evenly between the East Northland and Hauraki Gulf (GUR 1E) and Bay of Plenty (GUR 1BP) sub-stocks.
39. In the GUR 1W sub-stock, approximately 80-90% of red gurnard catch is taken by bottom trawl as part of the FMA 9 mixed trawl fishery. CPUE analyses and discussions with fishers undertaken for the SNA 8 stock assessment have identified that operators fishing on the west coast have modified their gear and trawl speeds to increase targeting of GUR 1 in recent years. This is largely due to a lack of SNA 8 ACE availability and subsequent attempts to minimise SNA by-catch.
40. Catch of GUR 1E is split between the bottom longline, bottom trawl, and Danish seine methods. The majority of GUR 1BP catch is taken by Danish seine, while a smaller proportion is taken by bottom trawl and bottom longline.
41. The proportion of catch taken from each sub-stock does not appear to have changed in recent years. In the past five fishing years, the most consistent decline in GUR 1 landings has occurred in GUR 1E, while the largest magnitude decline in landings has occurred in the GUR 1W sub-stock.
42. The decline in landings in the GUR 1W sub-stock despite increased targeting may indicate that biomass is declining, perhaps due to a period of below average recruitment. It is also possible that GUR 1 abundance in the western sub-stock may be declining due to interspecific competition for food with SNA 8, which has seen a large increase in biomass.

8.2 Customary Māori

43. The customary allowance for GUR 1 has not yet been set. Fisheries New Zealand holds insufficient information to estimate current customary catch. The Fisheries (Kaimoana Customary Fishing) Regulations 1998 have not been implemented in all of GUR 1. In the areas where they have not been implemented, there is no requirement for customary fishers to report their catch. It is also likely that tangata whenua are using recreational catch to meet their needs in GUR 1.
44. Fisheries New Zealand's records show that 56 customary authorisations were granted for the take of GUR 1 between 2001 and 2019, but the quantities taken are not known.
45. Fisheries New Zealand welcomes tangata whenua's views on the sufficiency of the proposed customary allowance.

8.3 Recreational

46. The recreational allowance for GUR 1 has not yet been set. The National Panel Survey of Marine Recreational Fishers (NPS) constitutes the best available information on recreational harvest. The [2017/18 NPS](#) estimated GUR 1 recreational harvest to be 86 tonnes (Table 3).

This is a decrease from the estimate of recreational harvest produced for the [2011/12 fishing year](#), although there is some uncertainty associated with these estimates.

Table 3: Recreational harvest estimates for GUR 1.

Year	Method	Number of fish	Total weight (t)	CV (t)
2011/12	Panel survey	241 957	103	±15 tonnes
2017/18	Panel Survey	168 798	86	±13 tonnes

9 Status of the stock

47. The status of the GUR 1 stock is assessed for each of the three sub-stocks that align with the major GUR 1 fisheries: GUR 1W, GUR 1E, and GUR 1BP. Management is guided by B_{MSY} -compatible target and limit reference points developed for each of these sub-areas based on the mean CPUE of the bottom trawl (tow) series in that sub-area over the period of the 1995/96 to 2011/12 fishing years. The soft limit and hard limit reference points are 50% and 25% of the target reference points, respectively.
48. The CPUE indices exhibit cyclical fluctuations that are consistent with the biomass fluctuations seen in short-lived, fast growing species like red gurnard.
49. According to the [2021 Fisheries Assessment Plenary](#), the standardised CPUE assessments for each of the GUR 1 sub-stocks were last updated in 2017, covering commercial catch and effort through the end of the 2015/16 fishing year. The CPUE indices for each of the sub-stocks are presented below (Figures 3-5).

GUR 1W

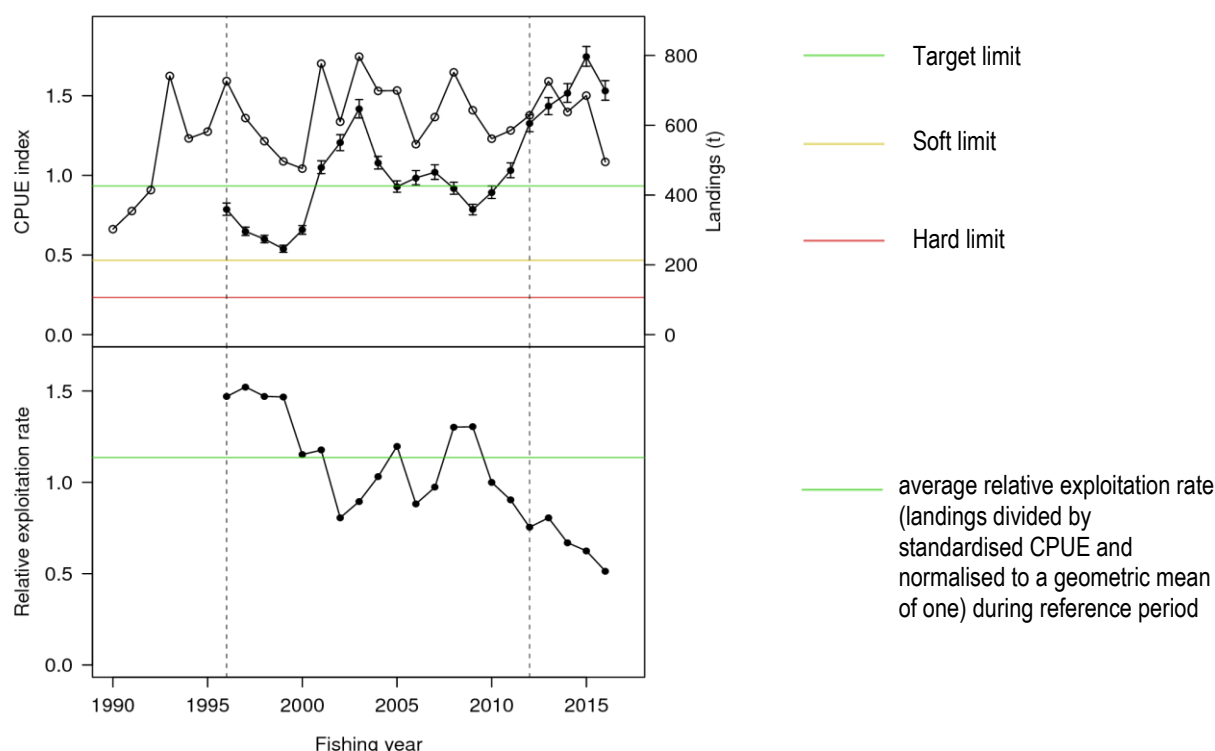


Figure 3: Top panel: landings (open circles) and standardised CPUE (combined model using tow by tow data from 1995–96, ± 2 s.e.). Bottom panel: annual relative exploitation rate for red gurnard in the GUR 1 west coast sub-stock.

GUR 1E

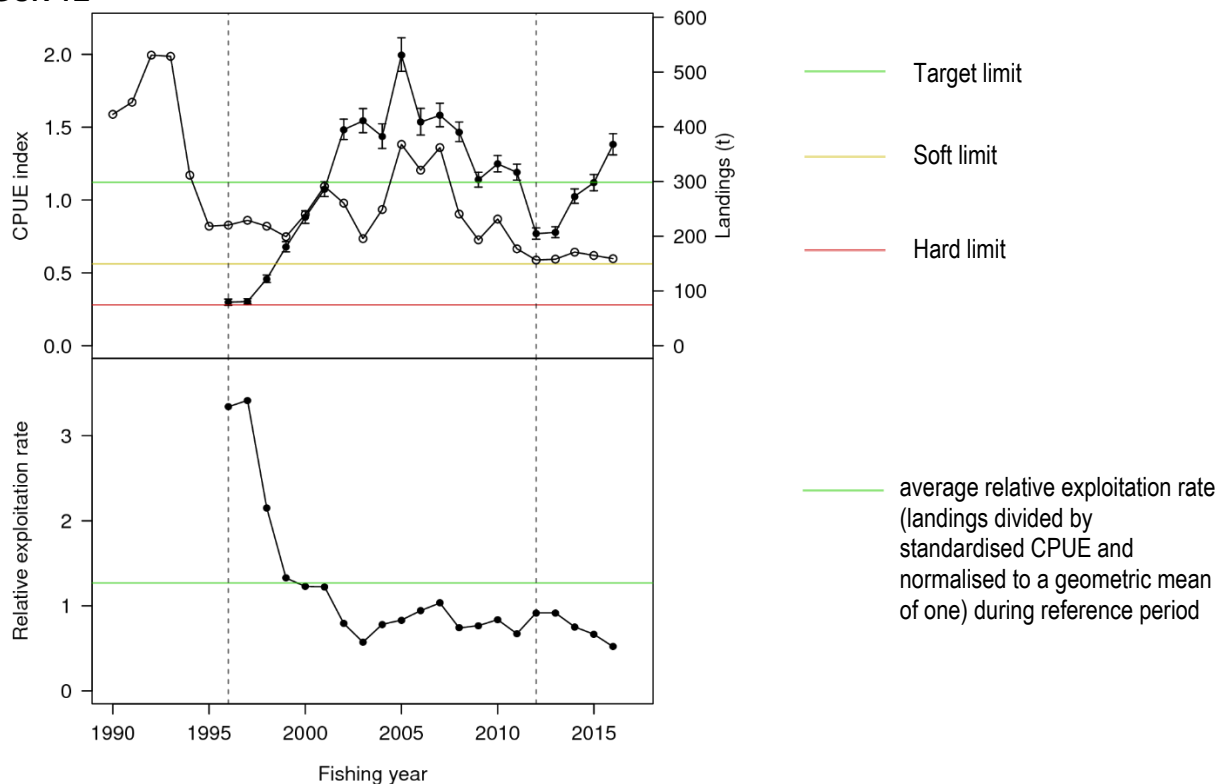


Figure 4: Top panel: landings (open circles) and standardised CPUE (combined model using tow by tow data from 1995–96, ± 2 s.e.). Bottom panel: annual relative exploitation rate for red gurnard in the GUR 1 east coast sub-stock.

GUR 1BP

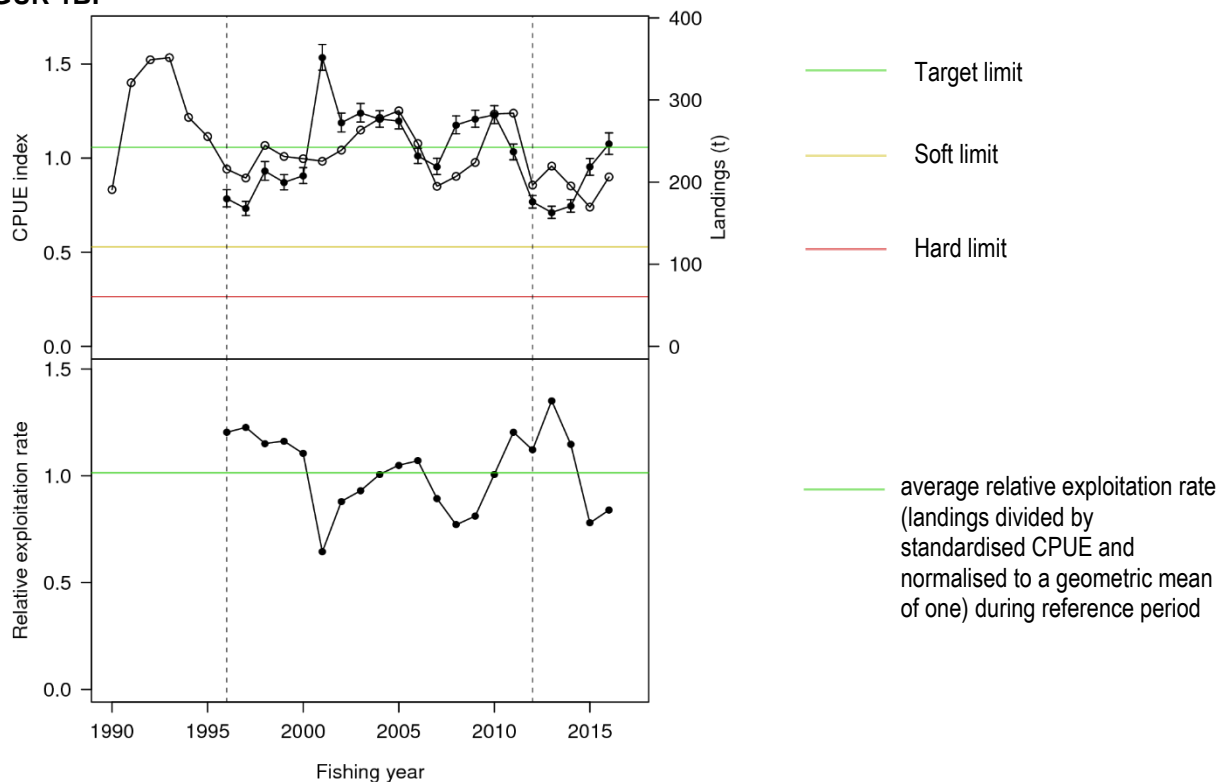


Figure 5: Top panel: landings (open circles) and standardised CPUE (combined model using tow by tow data from 1995–96, ± 2 s.e.). Bottom panel: annual relative exploitation rate for red gurnard in the Bay of Plenty.

50. Based on the 2017 standardised CPUE assessments, the Inshore Working Group concluded that the GUR 1W sub-stock was very likely ($> 90\%$) to be at or above the target, while the GUR 1E and 1BP sub-stocks were about as likely as not ($40\text{--}60\%$) to be at or above the target. The GUR 1W sub-stock was very unlikely ($< 10\%$) to be below the soft and hard limits, while the GUR 1E and BP sub-stocks were unlikely ($< 40\%$) to be below the soft limit and very unlikely ($< 10\%$) to be below the hard limit. This suggests that catch levels for all three sub-stocks were sustainable at that time, although the western sub-stock was faring better than the two eastern ones.
51. Since the 2015/16 fishing year, GUR 1 landings appear to have been declining. This may indicate poor recruitment and a decline in GUR 1 biomass, or it may indicate a change in fisher behaviour. Fisheries New Zealand is unable to draw any conclusions about this recent decline in landings until the CPUE indices and accompanying characterisation of the GUR 1 fishery are updated in 2022/23.
52. Recent inshore trawl surveys conducted on both coasts of the North Island (INT 2018-02 and INT2018-03) have been used to produce relative biomass estimates for red gurnard within the three sub-areas of GUR 1.
53. The West Coast North Island (WCNI) trawl survey was reinstated in 2017 after a 19-year hiatus. The relative biomass series for the core area of the survey, which covers the GUR 1W sub-stock, indicates substantially lower total biomass of red gurnard in 2018, 2019, and 2020 when compared to the earlier estimates in the series. The 2019 and 2020 relative biomass estimates were slightly higher than the 2018 estimate, which was the lowest estimate in the series. (See Figure 6 below).
54. The difference between the recruited biomass estimates for recent and older surveys is not as pronounced, suggesting that much of the recent decline in total biomass is attributable to a decline in pre-recruit biomass, potentially signifying poor recruitment to come in the GUR 1W sub-stock.

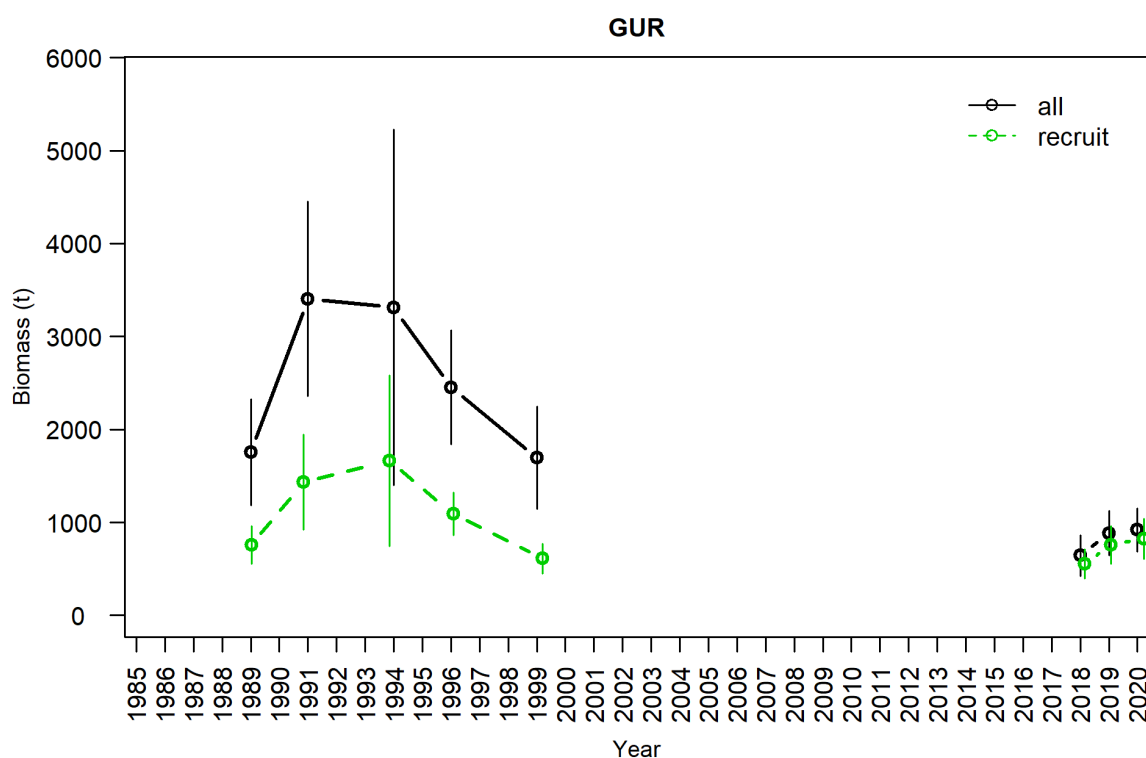


Figure 6: Biomass trends with 95% confidence intervals for recruited ($>30\text{cm}$) (dashed green line) and all (solid black line) GUR within the core area of the West Coast North Island trawl surveys.

55. Trawl surveys conducted in the Hauraki Gulf and Bay of Plenty in 2019 and 2020, respectively, generated relative biomass estimates for red gurnard in the east coast sub-stocks. Prior to this iteration, the surveys were last conducted in 2000. With only one recent data point for each

area, Fisheries New Zealand is unable to draw conclusions on recent trends in red gurnard relative biomass.

56. The 2019 estimate for red gurnard biomass in the Hauraki Gulf (part of the GUR 1E sub-stock) was higher relative to the preceding survey in 2000, but much lower than the series high in 1987 (Figure 7). The survey also found a male: female ratio of 0.31:1, which is a stronger female bias than documented in previous surveys.

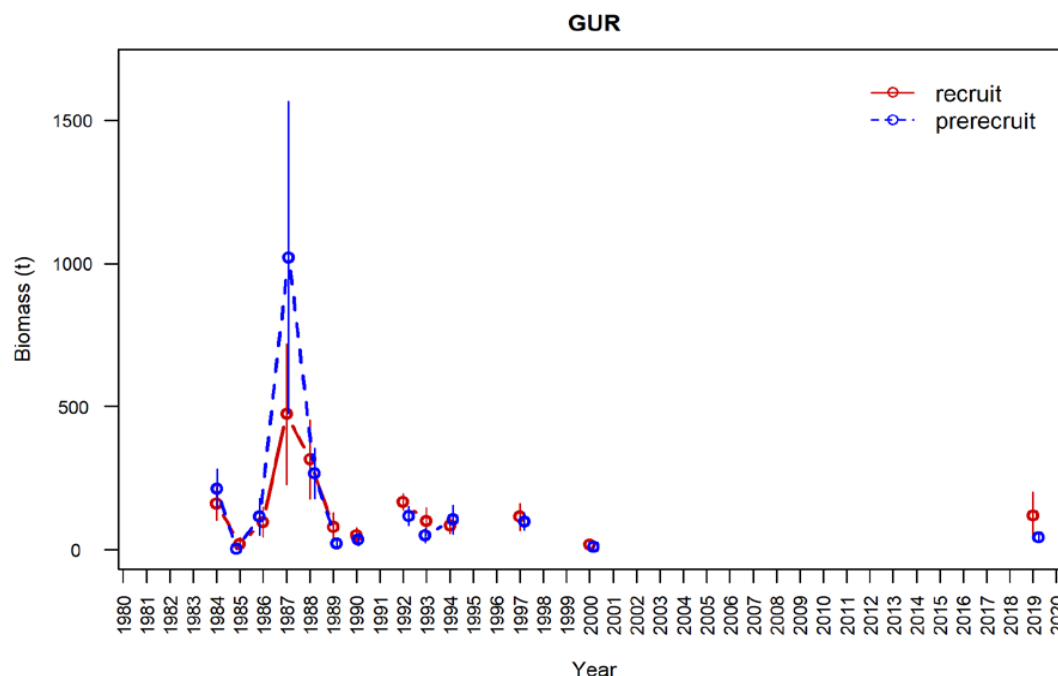


Figure 7: Biomass trends with 95% confidence intervals for pre-recruit (dashed blue line) and recruited (solid red line) GUR for the Hauraki Gulf surveys.

57. Red gurnard biomass in the Bay of Plenty appears to have declined relative to the preceding surveys between 1989 and 2000, although there is some overlap in the confidence intervals (Figure 8). Pre-recruit biomass in the 2020 survey is noticeably lower than that of previous surveys. A stronger female bias than documented in previous surveys was also evident here, where the male: female ratio was 0.67:1.

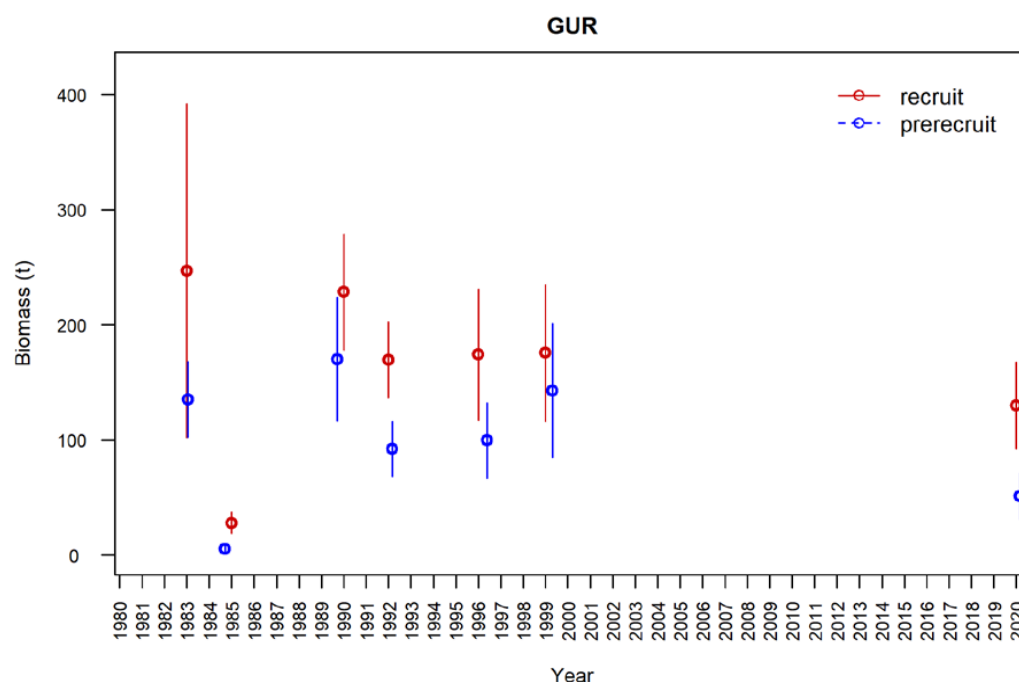


Figure 8: Biomass trends with 95% confidence intervals for pre-recruit (dashed blue line) and recruited (solid red line) GUR for the Bay of Plenty surveys.

10 Current and proposed TAC, TACC and allowance settings

58. A TAC has not been set for GUR 1. Three options are proposed for the TAC, TACC, and allowances for GUR 1. Fisheries New Zealand invites views on these proposed options (Table 4).
59. In each option, a customary allowance of 40 tonnes has been proposed for discussion. Fisheries New Zealand seeks input from tangata whenua as to whether this proposed allowance adequately provides for customary take.
60. Each option includes a proposed recreational allowance based on the best available information on recreational harvest, which is provided by the 2017/18 National Panel Survey. Fisheries New Zealand proposes a recreational allowance be set at 100 tonnes, based on the recreational harvest of 86 tonnes \pm 13 tonnes estimated from the 2017/18 panel survey (and rounded up to 100 for simplicity). Fisheries New Zealand is not proposing to review the current recreational daily bag limit of 20 red gurnard per person per day, nor to review the minimum legal size for recreationally caught red gurnard in GUR 1.
61. An allowance for other sources of mortality is intended to account for any mortality to a fish stock that occurs due to fishing activity but is not otherwise accounted for in the TAC. Potential sources of other mortality for GUR 1 could include: unreported commercial bycatch; mortality associated with injury from red gurnard contacted but not captured by trawl and Danish seine nets; mortality associated with recreational catch and release of red gurnard, especially those below the minimum legal size; and mortality associated with the accidental loss or damage of fishing gear.
62. Because the vast majority of the GUR 1 landings are taken by the commercial sector, it is reasonable to expect that the vast majority of other mortality caused by fishing in GUR 1 to be attributable to the commercial sector.
63. Fisheries New Zealand is proposing that the allowance for other mortality caused by fishing be set at approximately 7% of the TACC for GUR 1, across all options. In the October 2018 sustainability round, the then Minister of Fisheries indicated a preference for setting this allowance at approximately 10% of the TACC for inshore stocks caught predominantly by trawl in the absence of information to suggest an alternative approach is more appropriate.
64. In the case of GUR 1, Fisheries New Zealand considers a level around 7% of the TACC is more appropriate for two reasons.
 - Enhanced monitoring on the west coast North Island means Fisheries New Zealand has greater confidence in the catch and effort reported for the western sub-stock.
 - A substantial portion (~20-30%) of GUR 1 is taken by the more selective methods of bottom longlining and Danish seining, which are less likely to cause incidental mortality.

Table 4: Summary of current and proposed catch settings for GUR 1 from 1 October 2021. Figures are all in tonnes. Figures in parentheses indicate the change from current settings.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings	N/A	2,288	N/A	N/A	N/A
Option 1	2,328	2,045 ↓ (243 t)	40	100	143
Option 2	1,317	1,100 ↓ (1,188 t)	40	100	77
Option 3	996	800 ↓ (1,488 t)	40	100	56

10.1 Option 1

65. Setting the TAC at 2,328 tonnes and reducing the TACC by 243 tonnes to create allowances for recreational, customary, and other mortality caused by fishing preserves most of the potential

catch in the current management settings. This option will have the least impact on the commercial sector and ensures the sector has the flexibility to increase its catch.

- 66. This flexibility may be particularly valuable to fishers fishing the GUR 1W sub-stock, as the outcome of the SNA 8 review and the recent expansion of the trawl exclusion zone will both influence behaviour in the FMA 9 mixed trawl fishery. How fishers respond to these management changes remains to be seen, and it may be prudent to refrain from making significant changes to the management settings of GUR 1 until the effects of these changes on the FMA 9 mixed trawl fishery are better understood.
- 67. However, given the consistently low trend in catch of GUR 1 in comparison to the TACC and the recent decline in landings evident since the last CPUE update in 2017, the TAC and TACC settings proposed in this option could present a sustainability risk to GUR 1. Maintaining the TACC at a level well above demonstrated catch would provide the commercial sector with the potential to take catch that would likely exceed sustainable levels, based on recent CPUE information.

10.2 Option 2

- 68. Option 2 sets the TAC at 1,317 tonnes and the TACC at 1,100 tonnes. This option brings the TACC closer to the average annual landings of 1,072 tonnes since GUR 1 was introduced to the QMS. It also closely approximates the most recent peak in landings, when 1,103 tonnes were landed in the 2012/13 fishing year.
- 69. This option removes most of the uncaught TACC evident in the current management settings. It reduces the potential sustainability risk associated with fully catching the current TACC by bringing the catch limit in line with the demonstrated level of commercial take.
- 70. This option is predicated on the CPUE updates in 2016, which did not raise any sustainability concerns with catch levels at that time. This option does not respond to the more recent decline in GUR 1 landings seen over the past five years, nor the trends in relative biomass documented by recent trawl surveys, which could indicate a decline in GUR 1 abundance.
- 71. Based on recent catch patterns, this option is unlikely to constrain catch of GUR 1 and is not expected to result in economic costs to fishers, beyond any associated changes to ACE price. However, changes to the management settings for SNA 8 could potentially result in different fishing patterns in FMA 9. In this eventuality, catch levels in the GUR 1W sub-stock may change, potentially resulting in this option having a constraining effect on GUR 1 catch.

10.3 Option 3

- 72. Option 3 sets the TAC at 996 tonnes and the TACC at 800 tonnes.
- 73. This option presents a more precautionary management approach that responds to the recent decline in GUR 1 landings over the past five years, during which the average landings has been 792 tonnes, and the concerning signals from the recent trawl surveys. Based on recent trends in landings, a TACC of 800 tonnes would actively constrain catch in some years.
- 74. The CPUE indices were last updated four years ago and are not expected to be updated again until 2023. Given red gurnard's fast growth and relatively short lifespan, it is possible that GUR 1 biomass could change substantially within that seven-year window and that the recent decline in landings is already indicating a potential sustainability risk to the stock. In this case, a substantial reduction in the TAC and TACC would not be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, the MSY level.
- 75. Red gurnard tend to have large environmentally driven cycles in abundance. It is possible that, in years where recruitment is good, Option 3 would be overly conservative and could result in situations where the GUR 1 TACC limits fishers' ability to take the TACC of other co-occurring species, even in the absence of a sustainability risk to the GUR 1 stock. Fisheries using less selective methods, such as the bottom trawl fishery in FMA 9, would be most affected by an unnecessarily constraining TACC. More frequent monitoring and review of the GUR 1 TACC would enable fisheries management to be more responsive to changes in GUR 1 abundance.

11 Environmental interactions

76. The key environmental interactions with this fishery, which must be taken into account when considering sustainability measures concern marine mammals, seabirds, fish bycatch, benthic impacts, and habitats of particular significance.
77. The proposals in this paper aim to address a potential sustainability risk with GUR 1 by setting a TAC and allowances and, in the cases of Options 2 and 3, removing the significant excess evident in the current TACC. A TACC that is aligned with industry's demonstrated capability is unlikely to lead to any changes in fishing behaviour, meaning new or increased impacts on bycatch species, protected species, or the benthic environment are unlikely.
78. However, any change in the TAC and TACC of one stock caught in a multispecies fishery, like the FMA 9 mixed trawl fishery, may impact fishers' ability to take their ACE for the other stocks caught in that fishery. This could prompt fishers to change their behaviour. Any significant change in fishing behaviour, such as area/depth fished, gear configuration, and species targeted, has the potential to create new or increased impacts on bycatch species, protected species, or the benthic environment.
79. Increased observer coverage and cameras onboard some vessels will enhance Fisheries New Zealand's abilities to monitor environmental interactions along the upper west coast of the North Island (refer back to section 10).

11.1 Marine Mammals

80. Marine mammal interactions by vessels taking GUR 1 are relatively rare. Of the vessels that take GUR 1, those using the bottom trawl method have reported the highest number of interactions. In the last three full fishing years, bottom trawl vessels targeting red gurnard, snapper, John dory, tarakihi, or trevally in GUR 1 have reported five marine mammal interactions: three captures of dead New Zealand fur seals, one capture of an uninjured bottlenose dolphin, and one capture of a dead pilot whale.
81. In 2020, as part of the fisheries measures under the [Hector's and Māui Dolphins Threat Management Plan](#), the area closed to bottom trawling along the west coast of the North Island was increased from 1 nm from the shoreline out to 4 nm between Maunganui Bluff and Tirua Point.
82. Observer coverage in the west coast North Island nearshore has been particularly high since 2014 to monitor for potential interactions with Māui dolphins (Figure 9). This enhanced coverage area corresponds with a significant proportion of the area in which the GUR 1 sub-stock is taken but does not extend to statistical area 047 nor does it cover all of 046. In addition to enhanced observer coverage, a number of trawl and set net vessels operating on the west coast North Island have installed onboard cameras.



Figure 9: Observer coverage on trawl vessels in the Maui dolphin zone.

83. The options proposed in this paper are not expected to increase marine mammal captures in GUR 1.

11.2 Seabirds

84. The management of seabird interactions with New Zealand's commercial fisheries is guided by the National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries ([NPOA-Seabirds](#)).
85. Seabirds can accidentally get caught during commercial fishing. Commercial fishers must file daily reports about what they have caught. Fisheries New Zealand is now releasing these reports quarterly (from the 2019/20 fishing year). You can view this information on our webpage: <https://www.mpi.govt.nz/science/open-data-and-forecasting/fisheries/seabirds-and-protected-marine-species-caught-by-commercial-fishers/>
86. The Spatially Explicit Fisheries Risk Assessment ranks bird species according to their risk from commercial fisheries. The 2020 assessment identified black petrel as the most at-risk seabird, followed by five taxa in the second-highest category: Salvin's albatross, Westland petrel, flesh-footed shearwater, southern Buller's albatross and Gibson's albatross. The seabirds most commonly caught by vessels catching GUR 1 include flesh-footed shearwaters, black petrels, and sooty shearwaters.
87. The options proposed in this paper are not expected to increase seabird captures in GUR 1

11.3 Fish Bycatch

88. GUR 1 is taken primarily in multispecies fisheries alongside snapper, trevally, tarakihi, and John dory. As the options proposed in this paper suggest reduced TACCs, an increase in fish

bycatch as a result of this review is unlikely. The increases proposed in the SNA 8 review, however, may lead to greater fishing effort and consequently greater bycatch of other species in the FMA 9 bottom trawl multispecies fishery.

11.4 Benthic Impacts

89. All three of the main methods used to take GUR 1 may impact benthic habitats. Vessels using the bottom trawl, bottom long line, and Danish seining methods within GUR 1 report catches of corals, bryozoans, and sponges. The options proposed in this paper are not expected to increase benthic impacts within GUR 1.

11.5 Habitats of particular significance

90. The broad distribution and long spawning period of red gurnard makes it difficult to pinpoint specific areas of particular significance to the species. Two habitats that may be considered habitats of particular significance for red gurnard in GUR 1 are listed in Table 5 below.

Table 5: Summary of information on habitats of particular significance for GUR 1.

Fish Stock	GUR 1
Habitat	<ul style="list-style-type: none"> Spawning migration area in the Hauraki Gulf, between the inner gulf and Craddock Channel (between Little Barrier and Great Barrier Island).
Attributes of habitat	<ul style="list-style-type: none"> In the 1970s, Elder found evidence of a seasonal spawning migration offshore between the inner Hauraki Gulf and Craddock Channel (Elder, 1976). Catch rates, particularly for females, suggested a seasonal spawning migration during the spring and summer months. A corresponding post-spawning migration of spent fish occurring in the reverse direction was also documented. This movement from shallow to deeper water is likely to be related to water temperature.
Reasons for particular significance	<ul style="list-style-type: none"> Successful spawning is critical to supporting the productivity of the stock.
Risks/Threats	<ul style="list-style-type: none"> Mobile bottom contact fishing is permitted in the outer Hauraki Gulf, including in Craddock Channel. These methods contact the seafloor, disturbing benthic habitats. What makes Craddock Channel particularly favourable for red gurnard spawning is unknown, so the extent to which mobile bottom contact fishing may impact their spawning here is unclear. Changes in water temperature and water circulation.
Protections in Place	<ul style="list-style-type: none"> Mobile bottom contact fishing (bottom trawling, dredging, and Danish seining) are prohibited in the inner Hauraki Gulf. Vessels greater than 46 m are prohibited from trawling anywhere in FMA 1.

Fish Stock	GUR 1
Habitat	<ul style="list-style-type: none"> Shallow harbours and estuaries during the summer months, particularly along the upper west coast of the North Island.
Attributes of habitat	<ul style="list-style-type: none"> Juveniles that had recently settled have been found in shallow harbours and estuaries during the summer months of February and March, particularly along the upper west coast of the North Island. These have only been found in low numbers.

Reasons for particular significance	<ul style="list-style-type: none"> • May provide sheltered habitat for juvenile red gurnard. • May provide refuge from predation.
Risks/Threats	<ul style="list-style-type: none"> • The condition of many shallow harbours and estuaries has been compromised by non-fishing activities, including agricultural and urban runoff and sedimentation. • Recreational dredging in some northern harbours may compromise benthic habitats that provide protection for juvenile fish and food sources. • Changes in water temperature and water circulation.
Protections in Place	<ul style="list-style-type: none"> • All harbours and estuaries in FMAs 1 and 9 are protected from commercial trawling, Danish seining, and dredging. Additionally, the Kaipara Harbour was also closed to recreational scallop fishing in 2018, which could reduce recreational dredging. • The new National Policy Statement on Freshwater Management and the National Environmental Standards for Freshwater, which came into effect on 3 September 2020, should lead to improved water quality in shallow harbours and estuaries.

91. While not directly implemented to protect GUR 1 habitats, there are 12 marine reserves that fall within the GUR 1 QMA. Commercial and recreational take from these areas is prohibited. All 12 have been in place for at least 10 years. A map of marine reserves can be viewed on the Department of Conservation's website at: <https://www.doc.govt.nz/map/index.html?layers=Public%20conservation%20areas>.
92. The options proposed in this paper are not expected to threaten habitats of significance within GUR 1.

12 Uncertainties and risks

Status of the Stock

93. The primary uncertainty regarding GUR 1 is the current status of the stock. When the CPUE indices were last updated through to the end of the 2015/16 fishing year, there were no indications of a potential sustainability risk to the stock. However, since the updates, GUR 1 landings have declined. Annual landings over the past five years have been at their lowest level since GUR 1 was introduced into the QMS.
94. The cause of this decline in landings is unknown and, until the CPUE indices and fishery characterisation are updated, Fisheries New Zealand cannot say for certain whether or not the decline indicates a sustainability concern.

Implications of SNA 8 Review

95. The review of SNA 8 could have implications for the GUR 1W sub-stock, as both are caught by the FMA 9 mixed trawl fishery. An increase in the TAC and TACC for SNA 8 could lead to greater fishing effort in SNA 8 and, consequently, increased catches of GUR 1W. Alternatively, fishers may simply modify their behaviour to increase targeting of SNA 8, in which case fewer gurnard may be caught due to changes in areas fished and/or gear configurations.

Impacts on the GUR 1 ACE Market

96. The potential for reductions in the TACC to impact on the availability and price of ACE. is not a statutory consideration for setting or varying the TAC but rather a natural consequence of addressing a potential sustainability risk to the stock.

97. As the options proposed reflect current levels of catch in the most recent years, it is unlikely that reductions in the TACC would significantly impact on ACE prices. With approximately 31% of available ACE utilised over the last five complete fishing years, it is reasonable to expect that the ACE market would be able to withstand reductions in the TACC without major changes in the ACE price.

13 Deemed values

98. 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.
99. [The Deemed Value Guidelines](#) set out the operational policy Fisheries New Zealand uses to inform the development of advice to the Minister on the setting of deemed values.
100. The deemed value rates for GUR 1 are shown in Table 6.

Table 6: Standard deemed value rates (\$/kg) for GUR 1.

	Interim Rate (\$/kg)	Annual Differential Rates (\$/kg) for excess catch (% of ACE)					
		100-120%	120-140%	140-160%	160-180%	180-200%	200%+
Status quo	1.53	1.70	2.04	2.38	2.72	3.06	3.40

101. The average price paid by fishers during the 2019/20 fishing year for one kilogram of GUR 1 ACE was \$1.01. The 2019/20 port price index of GUR 1 was \$2.93 (Figure 10).

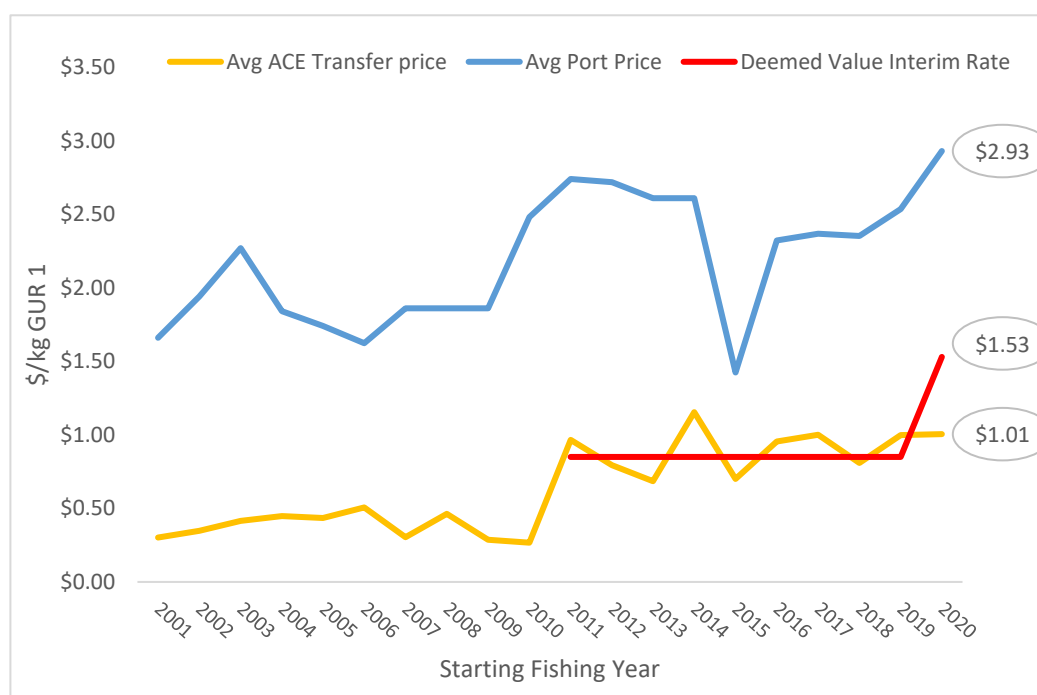


Figure 10: Average ACE transfer price, average port price, and deemed value interim rate for GUR 1 2001-present.

102. As the current deemed value rates of GUR 1 are set slightly above the average ACE price, no changes are proposed to the deemed value rates at this time. Fisheries New Zealand acknowledges that if the TACC is reduced, subsequent changes in fishing behaviour and the ACE market may result in the need for the deemed value to be re-evaluated in the future. Fisheries New Zealand welcomes any feedback on this.

14 Preferential allocation rights (28 N Rights)

103. There are 63.9 tonnes of preferential allocation ('28 N') rights associated with the GUR 1 stock. Preferential allocation rights were granted to permit holders under section 28N of the Fisheries Act 1983 who elected to take administrative rather than compensated reductions to their catch allocations. When the TACC is increased for a stock that has 28N rights associated with it, the quota shares of owners who do not have 28N rights are reduced and redistributed to the holders of 28N rights. As the options in this paper suggest reducing the TACC, 28N rights for GUR 1 are not expected to be triggered as a result of this sustainability round.

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

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

16 How to get more information and have your say

105. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 27 July 2021.
106. Please see the Fisheries New Zealand sustainability consultation webpage (<https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-2021-october-round>) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz.

17 Referenced reports

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