



Review of sustainability measures for trevally (TRE 2) for 2023/24

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Stock being reviewed

Trevally (TRE 2) – East Cape, Hawke’s Bay, East Coast of Wellington



Trevally – *Pseudocaranx dentex*, Araara

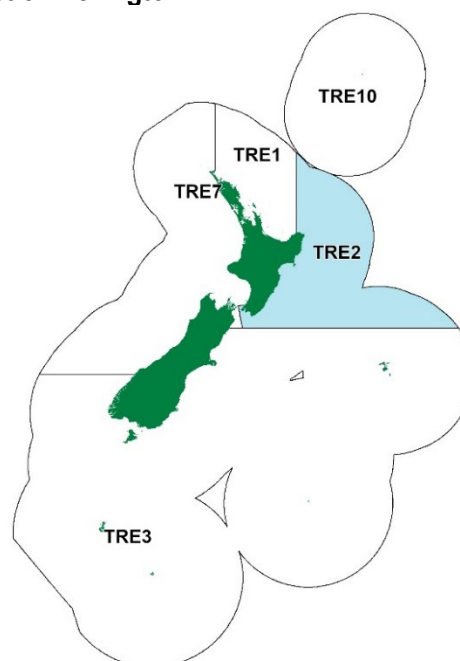


Figure 1: Quota Management Areas (QMAs) for trevally, with TRE 2 highlighted.

1 Why are we proposing a review?

1. Fisheries New Zealand (FNZ) is reviewing the sustainability measures for trevally in Quota Management Area (QMA) TRE 2 for the 1 October 2023 fishing year (Figure 1).
2. The last Total Allowable Commercial Catch (TACC) adjustment for TRE 2 was in 1992. Since then, the TACC has been consistently caught. In the last decade catches have regularly exceeded the TACC, where yearly commercial catch has averaged 260 tonnes, 19 tonnes above the TACC.
3. Over the same period there has been a general decline in the targeting of trevally in TRE 2. Commercial fishers have reported high abundance of trevally and find it difficult to avoid as by-catch when targeting other inshore species.
4. Trevally is caught commercially as by-catch throughout TRE 2, with the majority taken in the mixed-species (red gurnard, snapper and tarakihi) bottom trawl fishery in the Hawke Bay and Poverty Bay regions.
5. Catch Per Unit of Effort (CPUE)¹ indices for TRE 2 have been relatively stable, with an increasing trend from 2008–09 to 2016–17.
6. In 2022, following the TRE 1 Bay of Plenty sub-stock assessment, the Inshore Science Working Group concluded that this sub-stock and TRE 2 can be considered the same stock.
7. The 2022 assessment concluded that the TRE 1 Bay of Plenty sub-stock spawning biomass was at 66.4% SB_0 ², following an increasing trajectory from the 1980s. A model run combining the TRE 1 Bay of Plenty sub-stock with northern portion of TRE 2 (including Hawkes Bay)

¹ Catch per unit effort is the quantity of fish caught with one standard unit of fishing effort, e.g., the number of fish taken per 1,000 hooks per day or the weight of fish taken per hour of trawling. CPUE is often assumed to be a relative measure of fish abundance.

² SB_0 , known as virgin spawning biomass (also referred to in the paper as unfished biomass), is the theoretical carrying capacity of the spawning biomass of a fish stock. In some cases, it refers to the average spawning biomass of the stock in the years before fishing started. More generally, it is the average over recent years of the biomass that theoretically would have occurred if the stock had never been fished.

revealed identical results to the Bay of Plenty only assessment, that the stock was Likely (>60%) to be above the target of 40% SB_0 .

8. This review considers whether the Total Allowable Catch (**TAC**) setting is appropriate and if there is an opportunity for further utilisation.
9. Cyclone Gabrielle is expected to have had a significant impact on parts of the TRE 2 marine environment. The associated long-term effects of this cyclone on TRE 2 represent a source of uncertainty regarding stock abundance in the future. However, FNZ considers that the TRE 2 stock is likely to have some resilience to these impacts based on its links to the TRE 1 sub-stock in Bay of Plenty, which probably contains larger nursery areas for trevally (discussed further under section 4.2 below).
10. FNZ is consulting on options for a modest increase to the TAC of TRE 2 under section 13 (2)(c) of the *Fisheries Act 1996* (**the Act**), that allow any stock whose current level is above that which can produce the maximum sustainable yield (**MSY**)³ 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 MSY, having regard to the interdependence of stocks.

2 Summary of proposed options

11. Three options are proposed for TRE 2, as outlined in Table 1 below. Varying TAC increases are proposed in all options.
12. The modified *status quo* for TRE 2 is a proposed option. The current allowance for 'All other mortality caused by fishing' (currently 7 tonnes) does not align with the current practice of setting this allowance that equates to around 10% of the TACC for inshore trawl caught stocks. Therefore, Option 1 proposes to only alter this allowance and not to modify any other allowances within the TAC.

Table 1: Proposed management options (in tonnes) for TRE 2 from 1 October 2023.

Option	TAC	TACC	Allowances		
			Customary Māori	Recreational	All other mortality caused by fishing
Current settings	349	241	1	100	7
Option 1 (modified <i>status quo</i>)	366 (↑ 17 t)	241	1	100	24 (↑ 17 t)
Option 2	387 (↑ 38 t)	260 (↑ 19 t)	1	100	26 (↑ 19 t)
Option 3	408 (↑ 59 t)	279 (↑ 38 t)	1	100	28 (↑ 21 t)

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

3 About the stock

3.1 Fishery characteristics

14. The TRE 2 QMA comprises of waters off the eastern and southern North Island, from Cape Runaway (eastern Bay of Plenty) south and around to Mana Island off the west coast of the Wellington region.
15. Within the TRE 2 QMA, there are two main commercial fisheries: a mixed trawl fishery targeting either red gurnard or snapper, and a tarakihi targeted bottom trawl fishery.

³ Maximum sustainable yield is the largest long-term average catch or yield that can be taken from a stock under prevailing ecological and environmental conditions, and the current selectivity patterns exhibited by fisheries. It is the maximum amount of fishing that a stock can sustain without impairing its renewability through natural growth and reproduction.

16. Trevally are subject to a minimum legal size limit of 25 cm. Any trevally smaller than the minimum legal size must be returned to the water.
17. According to the National Panel Survey of Marine Recreational Fishers 2017/18, virtually all recreationally caught trevally is by fishing with a rod or line whilst on a watercraft. The amateur fishery is also subject to a minimum size limit of 25 cm.

3.2 Biology

18. Trevally have a wide sub-tropical and temperate geographic distribution, and are a common coastal species around the North Island and the north-west of the South Island, mainly in waters less than 100 m depth.
19. Trevally are both pelagic (open water) and demersal (living close to the sea floor) in behaviour. Juvenile fish up to two years old are found in shallow inshore areas including estuaries and harbours. Young fish enter a demersal phase from about one year old until they reach sexual maturity. At this stage adult fish move between demersal and pelagic phases.
20. Schools occur at the surface, in midwater and on the bottom, and are often associated with reefs and rough substrate. Schools of trevally are sometimes mixed with other species such as kōheru and kahawai.
21. Trevally appear to have a broad dietary preference. Common prey includes pelagic crustaceans, small squid, juvenile and larval fish. Surface schooling trevally feed on planktonic organisms, particularly euphausiids (krill). On the bottom, trevally feed on a wide range of invertebrates.
22. Trevally are known to reach 40+ years of age. The growth rate is moderate during the first few years, but after sexual maturity at 32 to 37 cm fork length (FL)⁴, the growth rate becomes very slow. The largest fish are typically around 60 cm FL and weigh about 4.5 kg; however, larger fish of 6 to 8 kg are occasionally recorded.
23. Fecundity (the potential to produce offspring) is relatively low until females reach about 40 cm FL. They appear to be batch serial spawners, releasing multiple small batches of eggs over periods of several weeks or months during the summer. Clearly defined spawning grounds have not been identified in New Zealand.
24. Trevally eggs are pelagic, and hatch about 28 hours after fertilisation. In both New Zealand and Australia, trevally larvae are common in near shore coastal waters during late summer. While little is known about the distribution of trevally eggs and larvae in New Zealand, they are thought to be widely distributed seasonally around the North Island's near-shore coastal waters.

3.3 Management background

25. Trevally were introduced into the QMS⁵ in 1986 with five QMAs. Prior to 1986 trevally had a TAC set, under the provisions of the 1983 Fisheries Act, initially at 3,220 tonnes.
26. When introduced to the QMS only a TACC was set, with no recreational, customary, or all other sources of fishing mortality allocation for TRE 2. The TACC for TRE 2 was set at 190 tonnes in 1986, and by 1992 this had increased to 241 tonnes.

⁴ Fork length is measured from the tip of the nose to the middle caudal fin ray, or 'V' in the tail.

⁵ For more information about the QMS go to <https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>

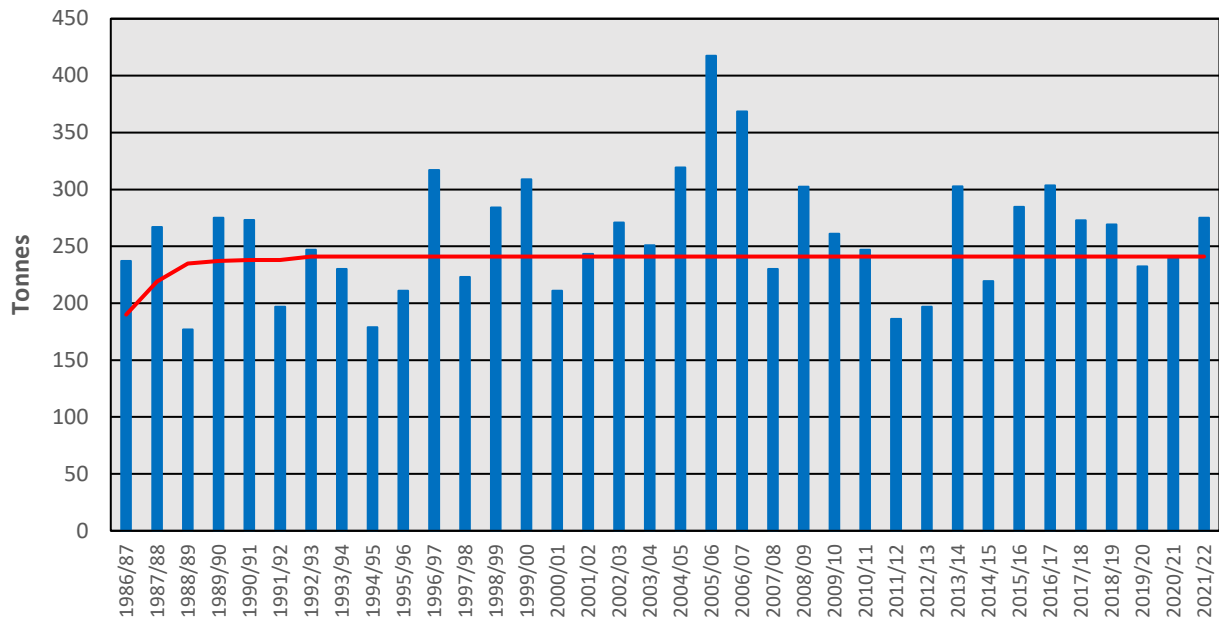


Figure 2: Reported commercial landings (tonnes) and TACC (red line) of TRE 2 since 1986 (year of introduction to the QMS).

27. As illustrated in Figure 2, the TRE 2 TACC has either been fully caught or overcaught for 23 of the 36 fishing years since the introduction of trevally to the QMS in 1986. Since October 2012, the TACC has been overcaught in six of the ten fishing years, with commercial catch exceeding 300 tonnes in two of those years.
28. In 2010, TRE 2 was allocated a 100-tonne recreational catch allowance, a one-tonne customary catch allowance, and a seven-tonne allowance for other sources of fishing mortality, combining to make a 349-tonne TAC.

4 Status of the stock

4.1 Trevally (TRE) 2 stock

29. There have been no published genetic studies looking at trevally stock separation. Historically, trevally fisheries were divided into three spatial areas: west coast of the North Island (TRE 7); northern east coast fishery including Hauraki Gulf and Bay of Plenty (TRE 1); and the east Wairarapa Coast (TRE 2).
30. Spatial patterns in CPUE and age composition data indicate that trevally in the Bay of Plenty area, and trevally in the East Northland, Hauraki Gulf and Ninety-Mile beach area, comprise of two separate stocks. Spatial patterns in CPUE and a single year of catch-at-age⁶ data indicate that trevally found in the northern portion of TRE 2 (including Hawke Bay) are part of the TRE 1 Bay of Plenty sub-stock.
31. There is no accepted stock assessment specifically for TRE 2.⁷ TRE 2 CPUE indices have been relatively stable, with an increasing trend from 2008–09 to 2016–17. This increase was corroborated by a tow-based series using data collected on Trawl Catch Effort Returns (a report that trawl fishers are required to complete after a fishing event)⁸. Age data is not available for TRE 2.
32. In an attempt to understand the links between TRE 1 and TRE 2, a revised CPUE analysis for TRE 2 was conducted in 2018, where combined CPUE indices were produced for 1989–90 to

⁶ Statistical analysis on the age of fish captured in scientific surveys and commercial fisheries.

⁷ Fisheries New Zealand (2023) – [May 2023 Fisheries Assessment Plenary](#).

⁸ Schofield, M.I.; Langley, A.D.; Middleton, D.A.J. (2022). [Characterisation and catch-per-unit-effort analyses for FMA 2 trevally \(TRE 2\) up to 2016–17](#). New Zealand Fisheries Assessment Report 2022/46. 52 p.

2016–17 using data aggregated to vessel-day resolution, and for 2006–07 to 2016–17 using tow resolution data. The two indices showed good correspondence with each other across the overlapping period, allowing them to be combined so the TRE 2 CPUE series could be compared with TRE 1 Bay of Plenty sub-stock CPUE series. The comparison of CPUE trends between the TRE 2 combined CPUE series and the TRE 1 Bay of Plenty index (Figure 3) showed good correspondence between 1989–90 and 2006–07, but a poor relationship thereafter.



Figure 3: The combined CPUE index for the TRE 2 vessel-day series for the 1990 to 2017 fishing years and the combined TRE 1 Bay of Plenty sub-stock trip-level index for the 1990 to 2013 fishing years.

33. The Northern Inshore Working Group (a Science Working Group convened by FNZ) has concluded that the magnitudes of changes in the previous TRE 2 CPUE indices were greater than could be expected if TRE 2 was a closed (separate) population, taking into account the longevity of the species. These indices were rejected by the Working Group as an index of relative biomass for TRE 2 due to some years showing the annual variation as implausible for a separate stock. This information, in conjunction with spatial patterns in CPUE and comparisons of age structure in the Bay of Plenty and TRE 2, led to the inference that trevally move between the TRE 1 Bay of Plenty sub-stock and TRE 2.
34. Given the biology of the species, and CPUE inverse relationship with the TRE 1 Bay of Plenty sub-stock in some years, it was considered that TRE 2 is part of the TRE 1 Bay of Plenty sub-stock (the core area), with migration between the two areas (Figure 4). The Working Group concluded that additional catch-at-age data is required to further validate the relationships between the two stocks.

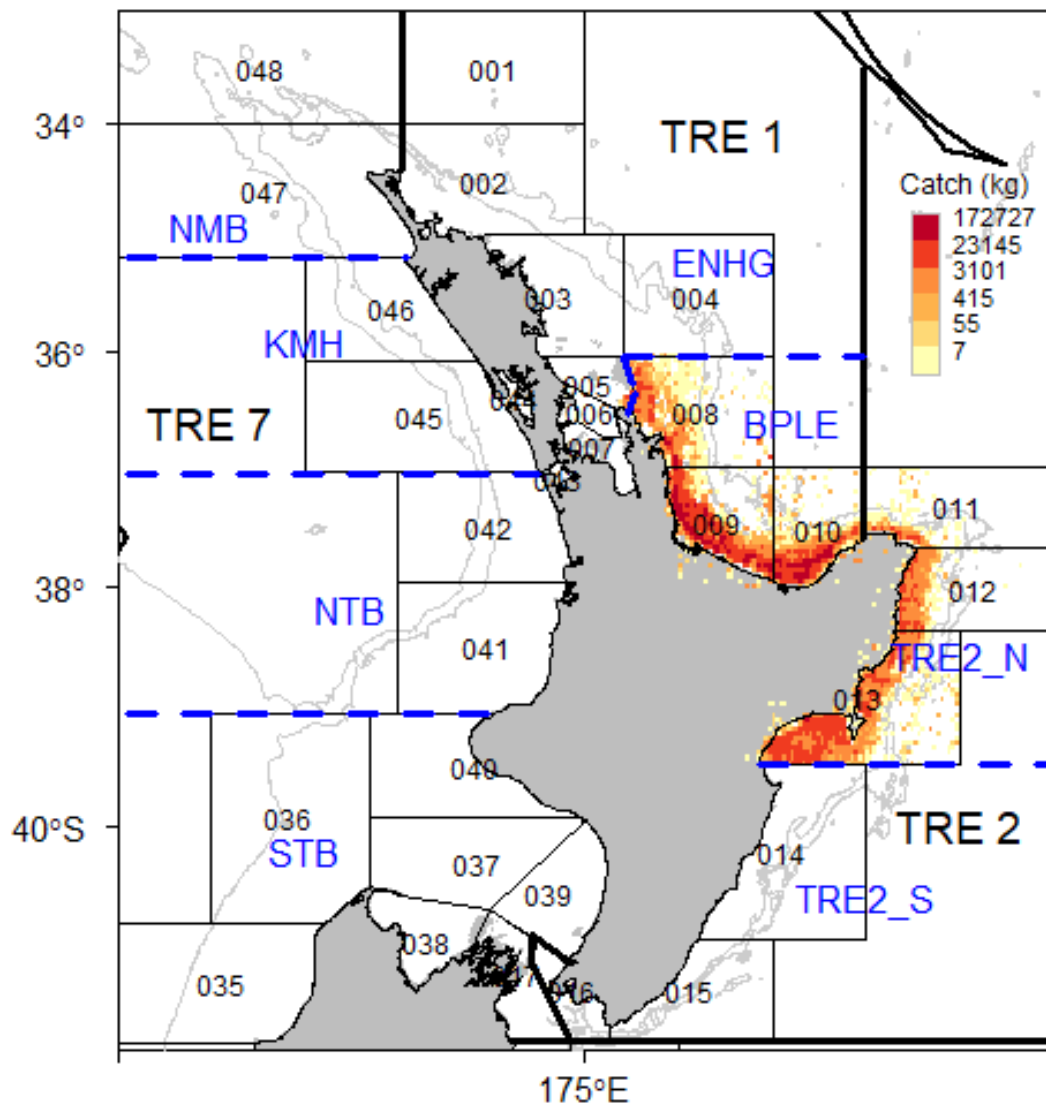


Figure 4: Map of North Island trevally sub-areas used by the Inshore Science Working Group, with refined catch data from the October 2021 analysis superimposed on the Bay of Plenty and northern TRE 2 sub areas. Note: ENHG = East Northland – Hauraki Gulf, BPLE = Bay of Plenty, TRE2_N = TRE 2 North, TRE2_S = TRE 2 South, STB = South Taranaki Bight, NTB = Northern Taranaki Bight, KMH = Kaipara-Manukau Harbour, NMB = Ninety Mile Beach.

35. In 2022, following the TRE 1 Bay of Plenty sub-stock assessment, the Inshore Science Working Group concluded that TRE 2 is part of this sub-stock, where a separate analysis with the inclusion of catch data from the northern part of TRE 2 (including Hawke Bay) revealed identical results to the Bay of Plenty only assessment. The two analyses also showed very similar Year Class Strength⁹, bottom trawl selectivity and age classes between the two assessments.
36. Based on this conclusion, it was decided that future stock assessments for TRE 2 will be done in conjunction with TRE 1.
37. The 2022 stock assessment for the TRE 1 Bay of Plenty sub-stock showed that it was likely (>60% probability) to be at or above the target (40% of SB_0), with the study concluding that the spawning biomass was at 66.4% SB_0 , following an increasing trajectory from the 1980s. Model projections indicate that this biomass will decline slightly at current catch levels, but with a low probability of dropping below 40% SB_0 by 2027 (when the next stock assessment is due).

⁹ The number of larvae hatched in a given year, calculated from survey data.

38. TRE 2 comes under Group 1 of the National Inshore Finfish Fisheries Plan¹⁰ due to the intention that future stock assessments for TRE 2 are completed in conjunction with TRE 1.
39. Given the status of TRE 1 Bay of Plenty sub-stock in relation to reference points¹¹ is known, and that TRE 2 is considered to be the same stock, it is deemed the stock's current biomass is above that which can produce the maximum sustainable yield.
40. Under section 13 (2)(c) of the Act, the Minister must set a TAC that allows 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 MSY, having regard to the interdependence of stocks.

4.2 Cyclone Gabrielle

41. On 12-16 February 2023, Cyclone Gabrielle caused unprecedented damage across parts of the North Island, especially the Gisborne and Hawke's Bay regions.
42. Cyclone Gabrielle produced strong winds and torrential rainfall causing loss of life, significant flooding, and damage to the environment (land and marine). Its effects have impacted several communities and industries, including fisheries in Fisheries Management Area (FMA) 2¹².
43. The environmental impacts of the cyclone are believed to be extensive and are considered to have long-term fishery implications. These include:
 - Physical debris (such as woody debris) has been widespread along the Gisborne and Hawke Bay coastline. This has caused navigational issues for fishing vessels, and fishing gear issues where nets have been caught and damaged. In turn this has changed fisher behaviour, such as travelling further out to new grounds or spending significant time repairing damaged gear.
 - The discharge of chemicals, sewage, and debris into the marine environment may cause polluted and anoxic conditions, potentially leading to localised mass die-off events of local benthic sea life.
 - Sedimentation will have wide-ranging impacts on inshore fisheries due to loss of habitat and productivity (such as smothering of rocky reefs, suspension in the water column and resettlement to new areas) resulting in the disruption to the food web and potential displacement of fish stocks.
44. It is expected that the full impact of Cyclone Gabrielle can only be properly evaluated in four to five years' time. This creates a source of uncertainty for the long-term trends in TRE 2 recruitment as there is limited understanding of how the cyclone has affected nursery areas and recent trevally recruitment. However, if there has been a one-year reduction in the proportion of trevally recruitment in this area, it is considered unlikely to have had a large impact on the stock as a whole given the number of year classes in this population.
45. Given the link between TRE 2 and the TRE 1 biological sub-stock in the Bay of Plenty, there are probably larger nursery areas in the Bay of Plenty that may provide some resilience to the TRE 2 stock from the effects of Cyclone Gabrielle. Trawl surveys have shown that juveniles (0+ and 1+ year class) occur mainly at depths shallower than 50 m around the northern North Island and occasionally off East Cape. Reported immature trevally catches along the northeast coast of the North Island are highest in the Bay of Plenty, with Tauranga Harbour considered to be an important nursery area.
46. As discussed in section 4.1 above, TRE 2 is considered part of the TRE 1 Bay of Plenty sub-stock and in turn considered above its target biomass. However, in the absence of a combined stock assessment there is limited understanding of how these QMAs interact. With CPUE

¹⁰ [National Inshore Finfish Fisheries Plan](#). October 2022. Fisheries New Zealand.

¹¹ Under the Harvest Strategy Standard, the default management target is 40% B₀ (unfished biomass), the soft limit is 20% B₀, and the hard Limit is 10% B₀.

¹² The FMA that encompasses the TRE 2 Quota Management Area.

analysis constituting an important source of information for TRE 2, changes in fisher behaviour in response to the cyclone means that future studies of CPUE must be interpreted with caution.

5 Catch information and current settings within the TAC

5.1 Commercial

47. The commercial harvesting of TRE 2 is primarily by trawling, with bottom trawl and precision harvest bottom trawl responsible for over 95% of the TRE 2 catch since October 2012.
48. The current TACC, last modified in 1992, is 241 tonnes. While there is no clear trend, most years since 1992 have seen commercial catch exceed the TACC.
49. The average commercial catch over the last 10 fishing years in TRE 2 (October 2012 to September 2022) has been 260 tonnes, which is 19 tonnes over the current allowance. Over the same period, TRE 2 catch has exceeded 300 tonnes in two of those years (303 tonnes in 2013/14 and 304 tonnes in 2016/17).
50. The FMA 2 trawl fleet operates between Cape Runaway and Palliser Bay, with the majority of catch and effort focused within the inshore waters of Poverty Bay and Hawke Bay.
51. There are two distinct trawl fisheries in TRE 2; a mixed trawl fishery, which targets red gurnard and snapper, and a tarakihi targeted bottom trawl fishery. This is further demonstrated in Figure 5 where most TRE 2 catch over the last decade has been through the targeting of red gurnard and tarakihi. Specifically, over the previous 10 years, 53% of the TRE 2 catch has been through the red gurnard target fishery and 29% has been through the tarakihi target fishery.
52. Figure 5 shows, over the last decade, that the proportion of TRE 2 catch through the targeting of snapper (SNA 2) initially increased and then generally declined. The proportion of TRE 2 catch through the targeting of trevally (15% in 2012/13 fishing year) has gradually declined to the point that in the previous fishing year no TRE 2 was targeted, demonstrating that TRE 2 is virtually a bycatch fishery.
53. Commercial fishers have reported high abundance of trevally and difficulty avoiding trevally catch when targeting other inshore finfish species.

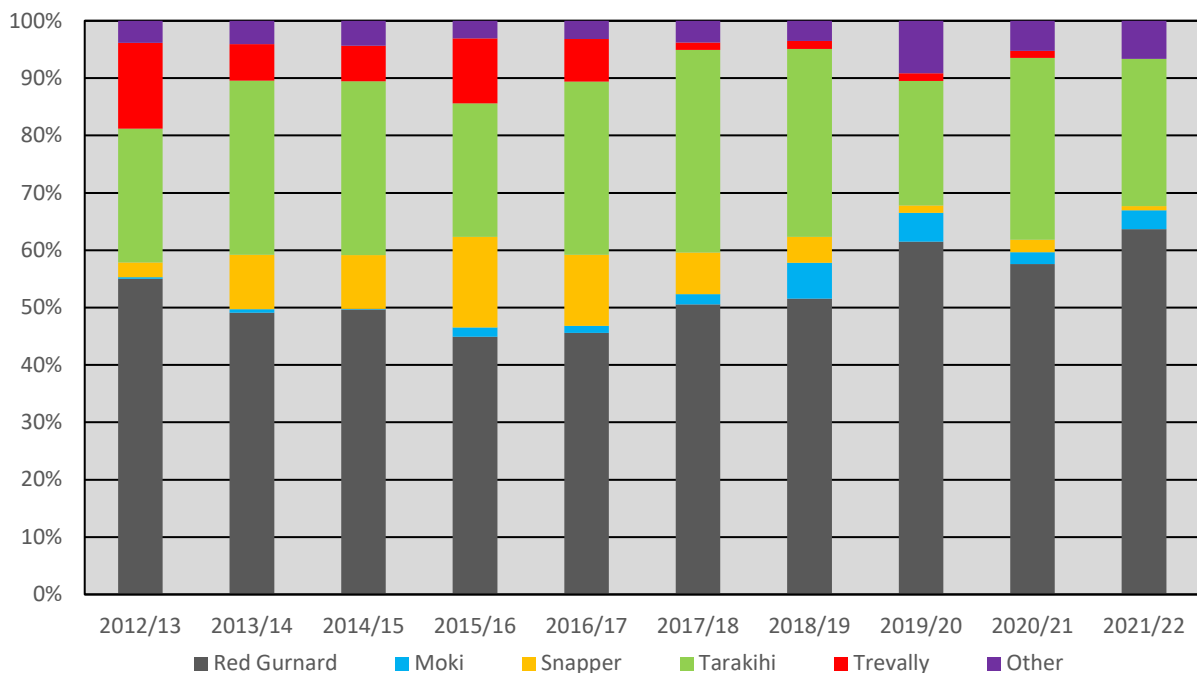


Figure 5: Proportion of TRE 2 catch by target fishery for each fishing year from 2012/13 to 2021/22.

5.2 Customary Māori

54. Trevally is an important traditional and customary food fish for Māori.
55. There is limited quantitative information available on the current level of customary non-commercial take for most fish stocks.
56. Reviewing reported customary catch data in TRE 2 over last five years shows that in 2020, eleven bins of trevally were harvested. Assuming an average bin weight of 20 kg suggests that 220 kg of trevally have been harvested for customary purposes over the last five years.
57. The customary allowance for TRE 2 is set at one tonne.
58. Note that there are different regulations in the North and South Islands for reporting authorised customary catch. In some cases, customary harvest might also be through the amateur fishing regulations (which do not require catch to be reported).
59. It appears that the customary allowance for TRE 2 is appropriate. However, FNZ welcomes input from tangata whenua to inform advice on this allowance.

5.3 Recreational

60. Trevally is highly regarded as a table fish, with some amateur fishers using trevally as bait.
61. The daily bag limit is 20 trevally per person in the combined daily bag limit for finfish (20 finfish per fisher, excluding specified baitfish and freshwater eels) within the Central Recreational Management Area.
62. According to the National Panel Survey of Marine Recreational Fishers 2017/18¹³, virtually all recreational trevally harvest is by fishing rod or line whilst on watercraft. The survey also showed that recreational bag sizes for TRE 2 were small, with 60% of fishing trips reporting just one fish caught.
63. The National Panel Survey for 2011/12 showed that for the 2011/12 fishing year the recreational harvest of TRE 2 was 11.15 tonnes (+/- 2.68 tonnes).¹⁴ The 2017/18 survey showed that for the 2017/18 fishing year the recreational harvest of TRE 2 was 16.97 tonnes (+/- 4.07 tonnes). This implies that recreational harvest is increasing.
64. The recreational allowance for TRE 2 is 100 tonnes (set in 2010), suggesting that this allowance is considerably underutilised. However, the National Panel Survey is currently being run for the 2022/23 fishing year that will provide updated estimates of recreational trevally catch in TRE 2. This current survey could inform a future review of the recreational allowance settings for TRE 2.
65. FNZ welcomes any input and submissions on the recreational settings for TRE 2.

5.4 Other sources of mortality caused by fishing

66. No quantitative estimates are available regarding the impact of other sources of fishing mortality on trevally stocks. The allowance for other sources of mortality caused by fishing is currently set at 7 tonnes, which equates to approximately 3% of the TACC.
67. The allowance for other sources of mortality caused by fishing is intended to provide for unrecorded mortality of fish associated with fishing, including incidental mortality from fishing methods or illegal fishing. This is naturally difficult to quantify when considering the range of contributing sources and as a result there is uncertainty in the estimates used to set this allowance.

¹³ Wynne-Jones et al. (2019) – [NPS 2017-18](#)

¹⁴ Wynne-Jones et al. (2014) – [NPS 2011-12](#)

68. For deepwater fisheries with high observer coverage, the other mortality caused by fishing allowance might be set at 1% of the TACC because data suggests that there is very little other mortality occurring. For inshore trawl fisheries with low coverage, there is generally more uncertainty, which is why the previous Minister of Fisheries in 2018 decided that the allowance should be set at an amount that equates to around 10% of the TACC for inshore trawl caught stocks, unless there is evidence to suggest otherwise.
69. The 2018 Inshore Science Working Group also used 10% of the commercial catch for estimating other mortality in their assessment of tarakihi (a commercially important inshore fish that is predominately caught by trawl). There is no new evidence to suggest that different levels would be more appropriate for trevally.
70. As discussed in section 5.1, TRE 2 commercial harvest is predominately by trawl, suggesting that the current setting of 3% of the TACC (that was set in 2010) is not appropriate.
71. Based on fishing event level data¹⁵, observer coverage for TRE 2 has been below 10% (between 0.6% and 7.5%) over the last five fishing years. FNZ deems that based on this low coverage and generally high associated uncertainty, an allowance for other mortality equating to around 10% of the TACC would be appropriate for TRE 2. The current camera rollout is likely to improve our understanding of other sources of mortality caused by fishing, which may provide an opportunity to review this setting in future.

6 Treaty of Waitangi obligations

72. Section 5 of the *Fisheries Act 1996* requires that the Act be interpreted and 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.
73. 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 tāngata 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

74. 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 kaitiakitanga¹⁶.
75. 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.¹⁷

¹⁵ 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.

¹⁶ 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.

¹⁷ 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.

76. TRE 2 covers the rohe of Ranghitaane (North Island) iwi, and the rohe of Mai i Ngā Kuri a Whārei ki Tihirau (Bay of Plenty), Ngāti Porou (Gisborne) and Mai Paritu tae atu ki Turakirae (Mahia to Wairarapa) Iwi Fisheries Forums.
77. In March and April 2023, the Mai i Ngā Kuri a Whārei ki Tihirau and Mai Paritu tae atu ki Turakirae Iwi Fisheries Forums were supplied with a long list of stocks being considered for review for the October 2022/23 sustainability round, including TRE 2. No specific feedback for TRE 2 was received.
78. FNZ will undertake further engagement with Iwi Fisheries Forums during consultation to seek input on the options outlined in this proposal and FNZ welcomes any input and submissions from tangata whenua on these options.

6.2 Kaitiakitanga

79. 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.
80. There is currently no plan for Ngāti Porou and the plan for Mai Paritu tae atu ki Turakirae is currently being developed.
81. Some iwi in the Te Tai Hauāuru Iwi Fisheries Forum have interests in the TRE 2 fishery, and the associated Forum Plan contains management objectives relevant to the proposal to review the TRE 2 stock. The Rangitaane iwi and the Mai i Ngā Kuri a Whārei ki Tihirau Iwi Fisheries Forum have an Iwi Fishery Plan for FMA 2 that also contains relevant management objectives. These management objectives are summarised in Table 2 below.

Table 2: TRE 2 relevant Iwi Fisheries Forums with Iwi fisheries Plan management objectives.

Iwi Fisheries Forum	Relevant Management Objectives contained in Iwi Fisheries Forum Plan
Rangitaane (North Island)	<ul style="list-style-type: none"> • Mana and rangatiratanga over Rangitaane (North Island) Fisheries is restored, preserved and protected for future generations. • Collaborative iwi partnerships in fisheries and environmental resource management are realised. • Rangitaane (North Island) have sufficient capacity to meet their individual and collective responsibilities as tiaki tangata/kaitiaki in partnership with others. • Our customary non-commercial fisheries are healthy, sustainable and support the cultural wellbeing of nga iwi o Rangitaane (North Island). • Our commercial fisheries are sustainable and support the economic wellbeing of Rangitaane (North Island) hapu and whanau.
Mai i Ngā Kuri a Whārei ki Tihirau	<ul style="list-style-type: none"> • Iwi are actively engaged with others to increase their fisheries potential within environmental limits. • The fisheries environment is healthy and supports a sustainable fishery.
Te Tai Hauāuru	<ul style="list-style-type: none"> • Our customary non-commercial fisheries are healthy, sustainable and supports the cultural wellbeing of Te Tai Hauāuru Iwi. • Our commercial fisheries are sustainable and support the economic wellbeing of Te Tai Hauāuru Iwi. • Mana and rangatiranga over our fisheries is restored, preserved and protected for future generations. • Iwi collaborate in fisheries and environmental resource management to achieve iwi driven objectives.

82. FNZ considers that the proposed management options are in keeping with the objectives of the above-mentioned Iwi Fisheries and Iwi Fisheries Forum Plans, which generally relate to active engagement with iwi and the maintenance of healthy and sustainable fisheries, but will seek

further input from Iwi Fisheries Forums during consultation on the options outlined in this proposal.

83. FNZ is also seeking further input from tangata whenua on how the proposed options for TRE 2 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 Mātaitai reserves and other customary management tools

84. There are a number of customary fisheries management areas within TRE 2. These include seven mātaitai reserves, two taiāpure and one temporary closure (Table 3). As the TRE 2 commercial fishery is virtually bycatch and that the options proposed are either to maintain the status quo or allow for a moderate increase in utilisation, it is not anticipated that the options proposed would negatively impact the availability of trevally in these areas. However, any positive impacts are unknown.
85. FNZ is seeking input from tangata whenua on how the proposed options for TRE 2 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.

Table 3: Customary fisheries management areas in TRE 2.

Customary Area	Management Type
Porangahau Taiāpure Palliser Bay Taiāpure	Taiāpure All types of fishing are permitted within a Taiāpure. The management committee can recommend regulations for commercial, recreational and customary fishing.
Waimārama Temporary Closure - blackfoot pāua	S186A temporary closures Section 186A temporary closures are used to restrict or prohibit fishing of any species of fish, aquatic life or seaweed or the use of any fishing method.
Te Kopa o Rongokānapa Mātaitai Hakihea Mātaitai Horokaka Mātaitai Toka Tamure Mātaitai Te Hoe Mātaitai Moremore Mātaitai (a) Moremore Mātaitai (b)	Mātaitai reserve Commercial fishing is not permitted within mātaitai reserves unless rulations state otherwise.

7 Environmental principles - section 9 of the Act

86. The environmental principles that must be taken into account when considering sustainability measures for TRE 2 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.
87. 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 on-board FNZ observer).
88. FNZ is currently coordinating a nationwide rollout of cameras on commercial fishing vessels¹⁸. It is expected that the on-board camera rollout, and the wider Fisheries Amendment Bill, will

¹⁸ [On-board cameras for commercial fishing vessels](#). Ministry for Primary Industries.

enhance our understanding of the TRE 2 stock by providing better verified information to underpin fisheries management decisions, and encourage better fishing practices.

89. It is expected that cameras operating in the TRE 2 fishery will be installed and transmitting footage on fishing vessels within the following schedule:
- Fishing vessels that trawl or longline by June 2024; and
 - Fishing vessels that setnet, purse seine, or danish seine by November 2024.

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

90. Since October 2008 there have been no protected species interactions within the TRE 2 target fishery.
91. Fisheries measures that have been put in place under the Hector's and Māui dolphin Threat Management Plan (TMP)¹⁹, which incorporate part of the TRE 2 QMA. Covering the whole of the west coast of the North Island, in TRE 2 the TMP starts within four nautical miles of the shore from Titahi Bay (Porirua) and continues round to Palmer Head (Wellington). This includes an extensive recreational and commercial set net fishing closure.
92. Management of seabird interactions with New Zealand's commercial fisheries is guided by the National Plan of Action – Seabirds 2020 (**NPOA-Seabirds**).²⁰ The NPOA-Seabirds sets out the New Zealand government's commitment to reducing fishing-related captures and associated mortality of seabirds. The vision of the NPOA-Seabirds is that New Zealanders work towards zero fishing-related seabird mortalities.
93. Management actions and research under the NPOA-Seabirds are guided and prioritised based on the seabird risk assessment that breaks down the risks to seabird populations by fishery groups. The most recent seabird risk assessment was published in 2020.²¹
94. New Zealand's inshore trawl fishery is considered responsible for a substantial portion of seabird capture risk.
95. There are a range of initiatives in place to reduce the risk of seabird captures in inshore trawl fisheries. These include work done by the black petrel working group and the development of Mitigation Standards to support fishers to identify the most effective mitigation techniques for their operations.
96. Fish species most commonly caught in association with trevally in TRE 2 are red gurnard (GUR 2) and tarakihi (TAR 2). GUR 2 has no sustainability concerns, with the stock biomass considered to be About as Likely as Not (40%–60%) to be at or above the target and overfishing unlikely (<40%) to be occurring.
97. TAR 2 is part of the East Coast tarakihi stock, which is currently subject to a time-constrained rebuild plan²² due to low abundance (currently below the biomass soft limit). This stock is highly monitored and, as TRE 2 is virtually a bycatch fishery, it is unlikely any TRE 2 TAC increase proposed will lead to an increase in tarakihi catch.
98. With TRE 2 considered to be largely a bycatch fishery (see 5.1), the proposed actions are unlikely to impact environmental interactions because fishing effort is unlikely to change as a result of the options proposed. Consideration of Cyclone Gabrielle is discussed in section 4.2. FNZ believes the proposed options do take all of the above principles into account.

¹⁹ [Hector's and Māui dolphin Threat Management Plan](#), and [North Island fisheries measures](#), 1 October 2020.

²⁰ Available at: <https://www.mpi.govt.nz/dmsdocument/40652-National-Plan-Of-Action-Seabirds-2020-Report>.

²¹ [Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–07 to 2016–17](#).

²² [Eastern Tarakihi Management Strategy and Rebuild Plan](#).

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

99. TRE 2 trevally are predominately caught as bycatch by bottom trawl, which can directly impact the biological diversity of the benthic environment. The proposed changes are unlikely to increase trawl effort. Bottom trawling in this fishery is also typically confined to areas that have been consistently fished over time (rather than areas of relatively undisturbed biodiversity).
100. FNZ will continue to monitor all commercial fishing activity in TRE 2, including any shifts in behaviour. In regard to trawling this includes improving predictive modelling to map seabed habitats and develop decision support tools for management, as well as refining methods to estimate the extent and effects of bottom fishing, as well as recovery.
101. Research has characterised both New Zealand's benthic environment and the level of benthic impact from fishing activity, which is summarised in the Aquatic Environment and Biodiversity Annual Review²³. The environmental impacts of fishing are summarised annually by FNZ and we will continue to monitor the bottom trawl footprint of fisheries.
102. Bottom contact fishing activity is likely to have some impact on benthic habitats that are also likely to be subjected to land-based stressors such as pollution and sedimentation.
103. The recent Cyclone Gabrielle is expected to have affected both trevally nursery grounds and adult demersal habitats, especially within the Poverty Bay and Hawke Bay area. The level of impact remains unknown and represents a source of uncertainty for TRE 2 recruitment in the next five or so years. NIWA is currently surveying these waters to better understand the benthic impacts of Cyclone Gabrielle.
104. There are three marine reserves within TRE 2: Te Tapuwae o Rongokako Marine Reserve (Gisborne), Te Angiangi Marine Reserve (Hawke's Bay) and Taputeranga Marine Reserve (Wellington). These reserves are free from fishing activity that could potentially impact their respective habitats. Commercial and recreational take from these areas is prohibited.

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

105. There are no specific habitats of particular significance identified for TRE 2 at this time. What is known is outlined in Table 4.
106. Trevally eggs are pelagic, and hatch about 28 hours after fertilisation. Little is known about the distribution of eggs and larvae and there are no clearly defined spawning grounds.
107. From about 4 cm length, juvenile fish up to two years old are found in shallow inshore areas including estuaries and harbours, these habitats and their attributes might be critical for successful recruitment and maintaining stock productivity. Sampling in estuaries has found juvenile trevally to be particularly associated with subtidal seagrass meadows, while also showing association with horse mussel beds, kelp forests and shallow sandy areas. However, it is unclear how differentially abundant they are across different estuarine and coastal habitats.
108. Shallow inshore areas can be vulnerable to land-based stressors, such as pollution and sedimentation. This can potentially impact the survival of juvenile trevally and hence recruitment to TRE 2.
109. Young fish enter a demersal phase from about 1 year old until they reach sexual maturity (3-4 years). At this stage adult fish move between demersal and pelagic phases. Schools occur at the surface, in mid-water and on the bottom, and are often associated with reefs and rough substrate. Pelagic schooling of adult trevally is more common during the winter months and is related to feeding.

²³ 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.

110. Surface schooling trevally feed on planktonic organisms, while on the bottom trevally feed on a wide range of invertebrates.
111. As TRE 2 is essentially a bycatch fishery, FNZ considers that the options proposed are unlikely to pose a threat to the areas identified as potential habitats of significance as it is unlikely they will result in increased targeting of Trevally. Table 4 summarises the available information on potential habitats of significance for TRE 2, the threats faced, and the existing protection in place.

Table 4: Summary of information on potential habitats of particular significance for fisheries management for TRE 2.

Fish stock	Trevally - TRE 2
Potential habitat of particular significance	<ul style="list-style-type: none"> • Water column – spawning and larval transport • Biogenic habitats in shallow inshore waters including estuaries and harbours – juveniles.
Attributes of habitat	<ul style="list-style-type: none"> • Biogenic habitats – structured habitats types are likely to provide shelter, refuge from predation, and access to food for juveniles. • Connectivity with spawning areas likely to be important for juvenile habitats.
Reasons for particular significance	<ul style="list-style-type: none"> • Water column: <ul style="list-style-type: none"> ○ Spawning habitat. ○ Eggs and larvae are transported in the surface plankton. ○ Adult migration. • Inshore biogenic habitat: <ul style="list-style-type: none"> ○ Potential juvenile nursery area. • Successful spawning and growth/survival of juveniles is critical to maintaining the productivity of the stock.
Risks/threats	<ul style="list-style-type: none"> • Climate change can modify temperature regime of water column, affecting spawning and larval transport. Climate change can also induce unusual storm events (such as Cyclone Gabrielle), destroying or modifying inshore biogenic habitats. • Mobile bottom-contact fishing methods can impact biogenic habitats, however there is limited understanding of the specific habitat attributes important for trevally. • Inputs of pollutants and sediments from land-based sources. <ul style="list-style-type: none"> ○ High nutrient load can lead to eutrophication. ○ Sedimentation can smother biogenic habitats.
Existing protection measures	<ul style="list-style-type: none"> • Several areas within the shallower inshore waters are closed to mobile bottom-contacting fishing methods and may provide some protection to potential nursery habitat²⁴. Specifically: <ul style="list-style-type: none"> ○ Several areas within Hawkes Bay closed to both trawl and danish seine fishing. ○ Prohibition of paired trawling along the North Island East Coast. ○ Prohibition of danish seining around the lower North Island. • Within FMA 2 there are four voluntary trawl closed areas²⁵. • Cook Strait Cable Protection Zone prohibits most fishing methods in this area. • The 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 and other shallower inshore waters. • The FNZ Coastal Planning Team engages with the RMA coastal planning processes to support marine management decisions to manage land-based impacts on habitat of particular significance for fisheries management.
Evidence	<ul style="list-style-type: none"> • 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. • 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.
Confidence	Medium – 2: Some empirical work exists but it is associated with high uncertainty, or expert has some personal knowledge

²⁴ [Fisheries \(Central Area Commercial Fishing\) Regulations 1986](#), SR 1986/217.

²⁵ As part of the [Eastern Tarakihi Management Strategy and Rebuild Plan](#) over 90% of quota shareholders for TAR 2 have agreed not to trawl in four voluntary closed areas within FMA 2.

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

112. Section 11 of the *Fisheries Act 1996* sets out various matters that the Minister 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 services²⁶.

8.1 Effects of fishing on any stock and the aquatic environment

113. In setting or varying a sustainability measure the Minister must take into account any effects of fishing on any stock and the aquatic environment.
114. “Effect” is defined widely in the Act.²⁷ The broader effects of removing trevally from the ecosystem as well as the more direct effects of fishing (virtually all trawling) must be taken into account.
115. All information with regard to the effects of TRE 2 harvest on any stock and the aquatic environment is discussed above under Section 7, and below under Section 9.

8.2 Existing controls that apply to the stock or area

116. 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.
117. Along with the catch limits and allowances set under the TAC, there are several management controls currently in place for TRE 2. There is a Minimum Legal Size (**MLS**) in place for commercial and recreational fishers and a maximum daily bag limit for recreational take (Table 5).

Table 5: Recreational and commercial restrictions for TRE 2.

Fishery	Restrictions
Recreational	<ul style="list-style-type: none"> – MLS of 25 centimetres fork length. – Minimum net mesh size of 100 millimetres. – Daily bag limit is 20 trevally per person in the combined daily bag limit for finfish (20 finfish per fisher, excluding specified baitfish and freshwater eels) in the Central Recreational Management Area.
Commercial	<ul style="list-style-type: none"> – MLS of 25 centimetres fork length. – Minimum net mesh size of 100 millimetres. – Spatial gear restrictions²⁸: <ul style="list-style-type: none"> – Several areas within Hawkes Bay closed to both trawl and danish seine fishing. – Prohibition of paired trawling along the North Island East Coast. – Prohibition of danish seining around the lower North Island. – Voluntary no trawl zones in FMA 2 (see Table 4).

²⁶ Sections 11 (2) and (2A) of the Act.

²⁷ 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.

²⁸ [Fisheries \(Central Area Commercial Fishing\) Regulations 1986](#). SR 1986/217.

118. Customary fishery management controls are discussed in section 6.3.

8.3 The natural variability of the stock

119. In setting or varying a sustainability measure the Minister must take into account the natural variability of the stock.

120. As highlighted in section 4, TRE 2 is considered to be part of the TRE 1 Bay of Plenty sub-stock. The 2022 stock assessment concluded that spawning biomass was at 66.4% SB_0 and that model projections indicated that the biomass will decline slightly at current catch levels, but with low probability of dropping below 40% SB_0 by 2027 (when the next stock assessment is due). Overfishing was about as likely as not (40–60%) to be occurring.

121. Given the status of TRE 1 Bay of Plenty sub-stock in relation to reference points is known, and that TRE 2 is deemed to be the same stock, it is considered the stock's current level is above that which can produce the maximum sustainable yield.

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

122. 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 TRE 2.

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

123. There are four regional councils and one unitary authority that have coastlines within the boundaries of TRE 2: Greater Wellington, Manawatu-Wanganui, Hawke's Bay, Gisborne, and Bay of Plenty. Each of these regions have policy statements and plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats.

124. The provisions of these various documents are, for the most part, of a general nature and focus mostly on land-based stressors on the marine environment. There are no provisions specific to trevally.

125. 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.

126. The FNZ Coastal Planning Team engages with the RMA coastal planning processes (including regional authorities) to support marine management decisions to manage not only the fishing effects on the coastal environment but also land-based impacts on fisheries.

8.4.2 Harvest Strategy Standard

127. Section 13 of the Act provides for the setting of a TAC for TRE 2, and guidance is provided by the Harvest Strategy Standard for New Zealand Fisheries (**HSS**).

128. 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.

129. The HSS is a policy statement of best practice in relation to the setting of 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.

130. 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.

131. As highlighted in section 4, TRE 2 is considered to be part of the TRE 1 Bay of Plenty sub-stock. The 2022 stock assessment concluded that spawning biomass was at 66.4% SB_0 and that model projections indicated that the biomass will decline slightly at current catch levels, but with low probability of dropping below 40% SB_0 by 2027 (when the next stock assessment is due). Overfishing was about as likely as not (40–60%) to be occurring.
132. In respect to this TRE 2 review, the Harvest Strategy Standard assists in meeting the requirements of sections 13(2)(c) by providing that stocks above MSY-compatible reference points are either decreased or increased towards a specified target based on MSY-compatible reference points or better.

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

133. 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

134. The National Inshore Finfish Fisheries Plan provides guidance on management objectives and strategies for finfish species, including trevally. The Plan will guide the operational management of inshore finfish fisheries for the next five years and is aimed at progressing New Zealand towards more ecosystem-based fisheries management.
135. Stocks are grouped within the Plan, with management approaches and objectives tailored accordingly for each group.
136. TRE 2 is considered part of the TRE 1 Bay of Plenty sub-stock and so falls under Group 1, future stock assessments for TRE 2 will be done in conjunction with TRE 1. This recognises that they are subject to more commercial utilisation than some other stocks, and that more comprehensive information for management exists.

8.6 Other plans and strategies

137. 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)

138. 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 Zealand²⁹. The Strategy sets a number of objectives across three timeframes. The most relevant to setting sustainability measures for TRE 2 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.
139. 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 biodiversity impacts, ecosystem function and habitat protection associated with adjustments to sustainability measures (see environmental interactions section above).

²⁹ [Te Mana o te Taiao – Aotearoa New Zealand Biodiversity Strategy](#). 2020.

9 Options and analysis

140. Under section 13 (2)(c) of the Act, the Minister must set a TAC that allows 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 MSY, having regard to the interdependence of stocks.
141. FNZ considers that the three options proposed below would not be inconsistent with the objective of moving the stock towards or above a level that can produce the maximum sustainable yield.

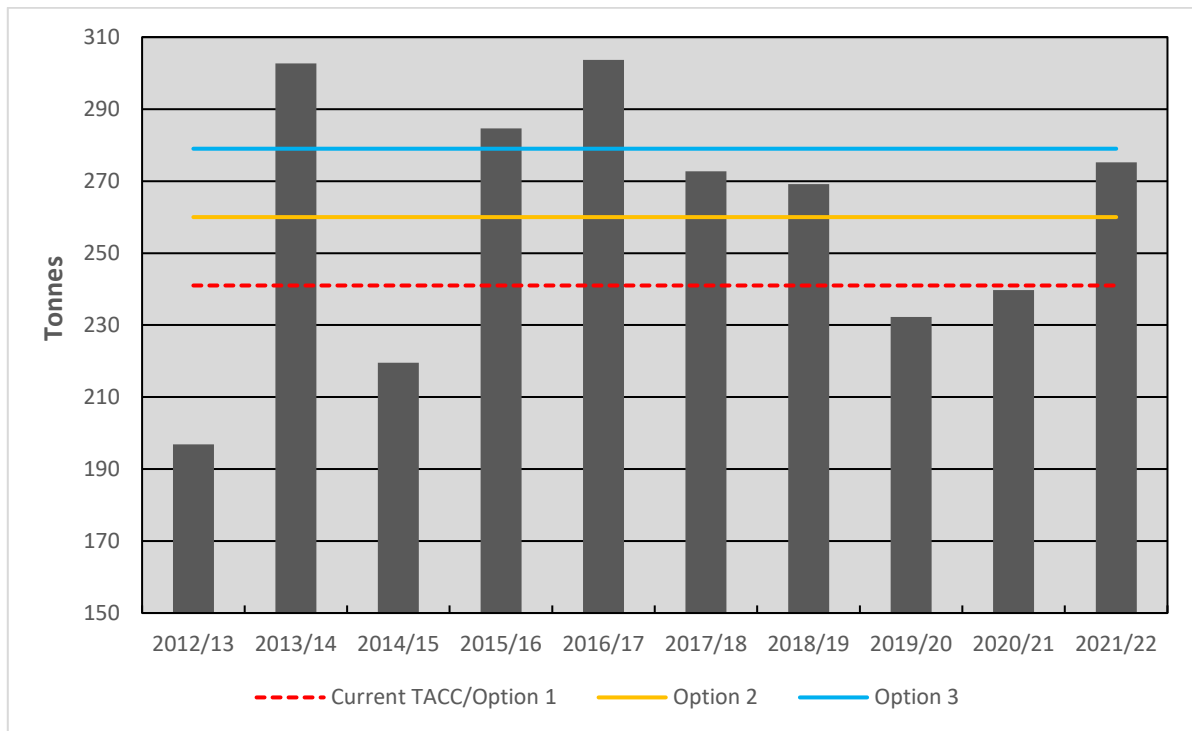


Figure 6: Reported yearly commercial landings (tonnes) from 2012/13 to 2021/22. Each Option’s proposed TACC is illustrated.

9.1 Current settings

TAC: 349 t	TACC: 241 t	Customary: 1 t	Recreational: 100 t	Other mortality: 7 t
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9.2 Option 1 – modified *status quo*

TAC: 366 t (↑ 17 t)	TACC: 241 t	Customary: 1 t	Recreational: 100 t	Other mortality: 24 t (↑ 17 t)
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9.2.1 Option 1 TAC

142. Option 1 proposes to increase the TAC from 349 to 366 tonnes, a 17-tonne increase pursuant to section 13(2)(c) of the Act.
143. As detailed earlier TRE 2 itself is considered to be part of the TRE 1 Bay of Plenty sub-stock which is deemed to be at or above its biomass target, and this is projected to remain like this until 2027 (when the next stock assessment is due).
144. Best available information indicates the stock appears to have remained at a stable level of biomass for an extended period of time.
145. It is not expected that this TAC change will alter fisher behaviour so it is considered extremely unlikely that the proposed TAC increase will lead to an increase in fishing effort. Therefore, it is

considered extremely unlikely that this option will lead to an increase impact on aquatic environments (see section 7), or interdependent stocks.

146. As mentioned, fecundity is relatively low until females reach about 40 cm FL. The proposed TAC increase is not expected to lead to an overall reduction in the fecundity of the stock.
147. This approach takes into account, to a high degree, the uncertainty associated with the recent impacts of Cyclone Gabrielle on the local marine environment.
148. There is no information to suggest that this option would present a significant sustainability concern, however there is uncertainty in the considerations discussed.

9.2.2 Option 1 Allowances

149. As discussed in section 5.2, customary reporting reveals that customary harvest of TRE 2 has been 220 kg over the last 5 years. Customary Māori allowance is considered to be appropriate and is proposed to remain at one tonne for all options.
150. Recreational allowance is proposed to remain at one hundred tonnes. As discussed in section 5.3, the previous two National Panel Surveys shows that this allowance is considerably underutilised (less than 20% harvest of the allowance during both surveys). However, this option suggests reviewing the TRE 2 recreational allowance after the current 2022/23 survey that could inform such a review.
151. The TRE 2 current allowance for 'All other mortality caused by fishing' does not align with the current practice of setting this allowance at an amount that equates to around 10% of the TACC for inshore trawl caught stocks, unless evidence suggests that an alternative is more appropriate (see section 5.4). Currently the allowance is 7 tonnes, which is 3% of the TACC. Option 1 proposes increasing this allowance to 24 tonnes (a 17-tonne increase).

9.2.3 Option 1 TACC

152. Option 1 proposes keeping the TACC at 241 tonnes, reflecting a cautious approach as discussed in section 9.2.1.
153. It carries the least sustainability risk of the options presented, however, it carries a higher risk of constraining commercial utilisation (and places less weight on the fact that the current stock biomass is likely to be above target).

9.3 Option 2

TAC: 387 t (↑ 38 t)	TACC: 260 t (↑ 19 t)	Customary: 1 t	Recreational: 100 t	Other mortality: 26 t (↑ 19 t)
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9.3.1 Option 2 TAC

154. Option 2 proposes to increase the TAC from 349 to 387 tonnes, a 38-tonne increase pursuant to section 13(2)(c) of the Act.
155. As detailed earlier TRE 2 itself is considered to be part of the TRE 1 Bay of Plenty sub-stock which is deemed to be at or above its biomass target, and this is projected to remain like this until 2027 (when the next stock assessment is due).
156. Best available information indicates the stock appears to have remained at a stable level of biomass for an extended period of time.
157. It is not expected that this TAC change will markedly alter fisher behaviour so it is considered very unlikely that the proposed TAC increase will lead to an increase in fishing effort. Therefore, it is considered extremely unlikely that this option will lead to an increase impact on aquatic environments (see section 7) or interdependent stocks.

158. As mentioned, fecundity is relatively low until females reach about 40 cm FL. While the proposed TAC increase is higher than Option 1, it is not expected to lead to an overall reduction in the fecundity of the stock.
159. This option makes some assumption that any impacts associated with Cyclone Gabrielle may have been modest, and that the stock has had some reasonable resilience to this weather event.
160. There is no information to suggest that this option would present a significant sustainability concern, however there is uncertainty in the considerations discussed.
161. FNZ considers an opportunity exists to allow further utilisation of the stock and this option proposes a modest increase to the TRE 2 TAC that is considered adherent to section 13(2)(c) of the Act.

9.3.2 Option 2 Allowances

162. Customary Māori allowance is proposed to remain at one tonne.
163. Recreational allowance is proposed to remain at one hundred tonnes. This option suggests reviewing the TRE 2 recreational allowance after the current 2022/23 National Panel survey that could inform such a review.
164. Under Option 2, the allowance for all other mortality caused by fishing is proposed to be increased to 26 tonnes (a 19-tonne increase). This aligns with the current practice of setting this allowance at an amount that equates to around 10% of the TACC for inshore trawl caught stocks.

9.3.3 Option 2 TACC

165. Option 2 proposes to increase the TACC from 241 tonnes to 260 tonnes, a 19-tonne increase.
166. Option 2 proposes a TACC that is a modest approach to provide for utilisation. It proposes to increase the TACC to the approximate average catch over the last ten years (260 tonnes) to reflect the actual catch over that time. Note that this proposed setting is below last year's reported commercial catch of 275 tonnes (see Figure 6).
167. With catch exceeding the commercial allowance for most years, this option considers a TACC setting that is in line with levels of utilisation over the last decade. However, as this species is presently only caught as bycatch, it is unlikely this will lead to an increase targeting of trevally in TRE 2.
168. Option 2 imposes a higher level of risk than Option 1 but does acknowledge historical over catch by aligning the TACC to actual catch over the last decade.

9.4 Option 3

TAC: 408 t (↑ 59 t)	TACC: 279 t (↑ 38 t)	Customary: 1 t	Recreational: 100 t	Other mortality: 28 t (↑ 21 t)
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9.4.1 Option 3 TAC

169. Option 3 proposes to increase the TAC from 349 to 408 tonnes, a 59-tonne increase pursuant to section 13(2)(c) of the Act.
170. As detailed earlier TRE 2 itself is considered to be part of the TRE 1 Bay of Plenty sub-stock which is deemed to be at or above its biomass target, and this is projected to remain like this until 2027 (when the next stock assessment is due).
171. Best available information indicates the stock appears to have remained at a stable level of biomass for an extended period of time.

172. With Option 3 proposing a higher TAC than Options 1 and 2, there is a relatively higher level of risk.
173. This proposed TAC increase could alter fisher behaviour. Most TRE 2 harvest is bycatch so it is considered unlikely that the proposed TAC increase will lead to a significant increase in fishing effort. However, if there is an increase in fishing effort then there is an elevated risk of increased impact on the aquatic environment (see section 7) or interdependent stocks, in comparison with Options 1 and 2.
174. As mentioned, fecundity is relatively low until females reach about 40 cm FL. While the proposed TAC increase for this option is higher than Options 1 and 2, it is not expected to lead to an overall reduction in the fecundity of the stock.
175. This option makes some assumption that any impacts associated with Cyclone Gabrielle may have been minimal, and that the stock has had significant resilience to this weather event.
176. There is no information to suggest that this option would present a significant sustainability concern, however there is a higher level of uncertainty than the other options proposed.
177. FNZ considers an opportunity exists to allow further utilisation of the stock and this option proposes an increase to the TRE 2 TAC that is considered adherent to section 13(2)(c) of the Act.

9.4.2 Option 3 Allowances

178. Customary Māori allowance is proposed to remain at one tonne.
179. Recreational allowance is proposed to remain at one hundred tonnes. This option suggests reviewing the TRE 2 recreational allowance after the current 2022/23 survey, as this survey could inform such a review.
180. Under Option 3, the allowance for 'all other mortality caused by fishing is proposed to be increased to 28 tonnes (a 21-tonne increase). This aligns with the current practice of setting this allowance at an amount that equates to around 10% of the TACC for inshore trawl caught stocks.

9.4.3 Option 3 TACC

181. Option 3 proposes to increase the TACC from 241 tonnes to 279 tonnes, a 38-tonne increase.
182. Option 3 proposes a TACC, which is just above last year's reported catch (275 tonnes). The increase in allowance provides for more utilisation opportunity than Option 2.
183. This option sets the TACC above the average catch over the last 10 years, potentially allowing for an increased level of utilisation, and is within the bounds of the highest reported catch over that time (see Figure 6). However, as this species is presently only caught as bycatch, it is not expected that this will lead to an increase targeting of trevally in TRE 2.
184. Option 3 imposes a relatively higher level of risk compared to Options 1 and 2. However, the proposed allowance is within the bounds of previous reported catch over the last decade.
185. There is no information to suggest that this option would present a significant sustainability concern, however there is uncertainty.

10 Economic considerations

186. The TRE 2 fishery supports many people, including quota holders, commercial fishers, licensed fish receivers, and seafood processing facilities. To give a sense of scale and distribution, based on the 2021/22 fishing year, 56% of TRE 2 quota was owned by four entities, and the

remaining 44% of quota was owned by 32 entities. As at the end of the 2021/22 fishing year, there were 36 commercial entities holding ACE: 64% held by four entities, and the remaining 36% held by 32 entities.

187. The economic impacts associated with all options proposed for TRE 2 are likely to be minimal. This stock is virtually caught as bycatch, implying fishers are not actively targeting it for profit, and that the TACC has been overcaught for the majority of the time since the stock's last TACC modification in 1992.
188. Provided recent catch trends continue Option 1 will maintain the *status quo* for fishers, Option 2 is expected to provide for existing levels of utilisation, and Option 3 will allow for a minor increase in utilisation. It is therefore unlikely that fishers would be required to adjust their fishing behaviour in response to the proposed changes.
189. Any increase in TACC will result in more available TRE 2 ACE to trade, which would be expected to result in fewer deemed value payments as fishers are able to balance their catch more effectively. This is expected to result in a minor decrease in some fishers' expenses. If Option 1 is carried through then the *status quo* will likely remain.
190. Whilst practically a bycatch species, there is potential that any increase in TRE 2 ACE may incentivise fishers to target TRE 2 more frequently in future. To what degree if any, and what economic impacts that may have, are unknown. FNZ will continue to monitor fishing activity regardless of which option is adopted.

11 Deemed values

191. 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.
192. 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.
193. The deemed value rates for TRE 2 are shown in Table 6.

Table 6: Current deemed value rates (\$/kg) for TRE 2.

Stock	Interim Rate (\$/kg)	Annual Differential Rates (\$/kg) for excess catch (% of ACE)					
		100-120%	120-140%	140-160%	160-180%	180-200%	200%+
TRE 2	1.13	1.25	1.50	1.75	2.00	2.25	2.50

194. The average price paid by fishers during the 2021/22 fishing year for one kilogram of TRE 2 ACE was \$0.67. The most recent port price (2023/24) for TRE 2 is \$2.28/kg. The annual deemed value is set appropriately between these two figures (Figure 7).

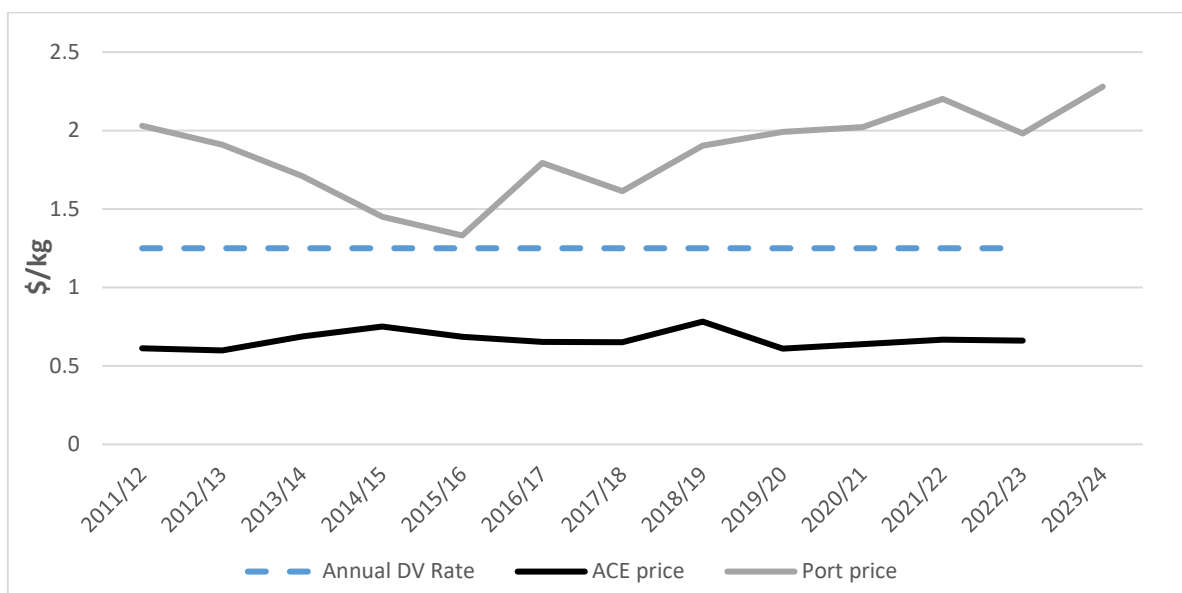


Figure 7: Average ACE price, average port price and deemed values (\$/kg) for TRE 2 from 2011/12 to the current fishing year. Note that the average ACE transfer price for 2022/23 is based on a smaller sample size given that the fishing year is not yet complete.

195. FNZ is satisfied that the current deemed values are consistent with section 75(2)(a) of the *Fisheries Act 1996* 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 TRE 2 at this time.
196. FNZ acknowledges that if the TACC is increased, 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.
197. 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?
198. 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

199. FNZ invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 17 July 2023.
200. 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.

14 Legal basis for managing fisheries in New Zealand

201. 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 Fisheries New Zealand (2020). National Plan of Action — Seabirds 2020. Accessible at: <https://www.mpi.govt.nz/dmsdocument/40652-National-Plan-Of-Action-Seabirds-2020-Report>
- 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 (2011). Operational Guidelines for New Zealand's Harvest Strategy Standard. Accessible at: <https://www.mpi.govt.nz/dmsdocument/19706-OPERATIONAL-GUIDELINES-FOR-NEW-ZEALANDS-HARVEST-STRATEGY-STANDARD>
- Fisheries New Zealand (2020). Guidelines for the review of deemed value rates for stocks managed under the Quota Management System. Accessible at: <https://www.mpi.govt.nz/dmsdocument/40250/direct>
- 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.
- Fisheries New Zealand (2023). Fisheries Assessment Plenary, May 2023: stock assessments and stock status. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. Accessible at: <https://www.mpi.govt.nz/science/fisheries-science-research/about-our-fisheries-research>
- Morrison, Mark, Emma G. Jones, Darren M. Parsons, and C. M. Grant. 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. Wellington (New Zealand: Ministry for Primary Industries, 2014.
- New Zealand Government (2020). Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020. Accessible at: <https://www.doc.govt.nz/nature/biodiversity/aotearoa-new-zealand-biodiversity-strategy/>
- Schofield, M.I.; Langley, A.D.; Middleton, D.A.J. (2022). Characterisation and catch-per-unit-effort analyses for FMA 2 trevally (TRE 2) up to 2016–17. New Zealand Fisheries Assessment Report 2022/46. 52 p.
- 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>