Fisheries New Zealand
Tini a Tangaroa

Review of sustainability measures for jack mackerel (JMA 7), kingfish (KIN 7 & 8), and pilchard (PIL 7 & 8) for 2024/25

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Te Kāwanatanga o Aotearoa
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Jack mackerel/hauture (JMA 7), kingfish/haku (KIN 7 & KIN 8), and pilchard/mohimohi (PIL 7 & PIL 8) – west coasts of North and South Islands

Jack mackerel/ hauture
Top: *Trachurus novaezelandiae* (JMN)
Centre: *Trachurus declivis* (JMD)
Bottom: *Trachurus murphyi* (JMM)

Pilchard / mohimohi
Sardinops sagax

Kingfish/ haku
Seriola lalandi

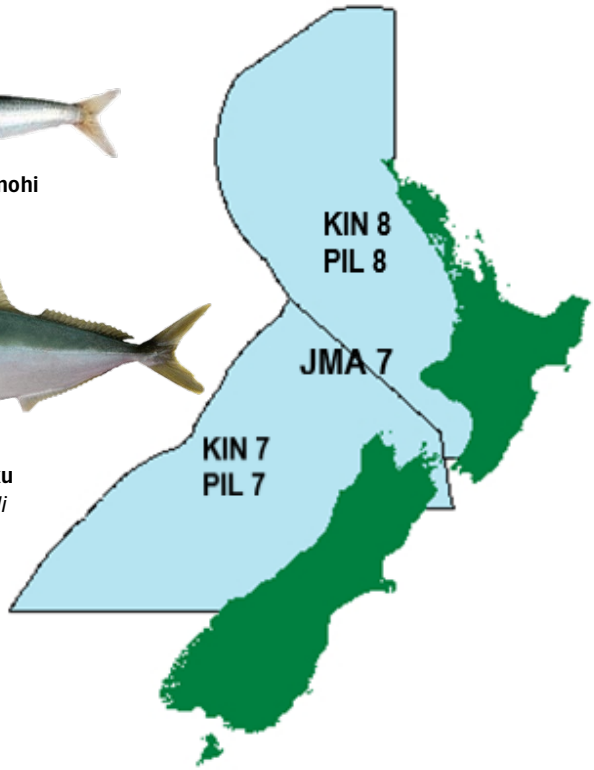


Figure 1: Quota Management Areas (QMAs) for jack mackerel/hauture (JMA), kingfish/haku (KIN), and pilchard/mohimohi (PIL). The KIN 7 and PIL 7 stocks cover the West Coast and top of the South Island, KIN 8 and PIL 8 cover the west coast of the North Island, and JMA 7 encompasses the west coast of both islands.

Why are we proposing a review?

1. Fisheries New Zealand (**FNZ**) is reviewing sustainability measures for three species or species complexes in their west coast North Island / South Island QMAs for the 1 October 2024 fishing year (Figure 1).
2. Stock assessments that concluded in 2023 indicate there are utilisation opportunities for jack mackerel in JMA 7, and for kingfish in KIN 7 & 8. A review of the Total Allowable Catches (**TACs**) for PIL 7 & 8 is also warranted, based on catch data that has become available since 2002.
3. The five stocks are being reviewed together as most catch is taken by the same trawl vessel fleet.

Proposed options

4. Factors considered in the course of developing the options proposed for JMA 7, KIN 7 & KIN 8, and PIL 7 & PIL 8 (Table 1) are outlined below.
5. For JMA 7, modest increases to the Total Allowable Commercial Catch (**TACC**) are proposed. This reflects the likely ecosystem role of jack mackerels as prey species as well as the uncertainty regarding future abundance trends. High observer coverage in the fishery will allow FNZ to continue to monitor any changes to the increased catch proposed under the options to inform the next planned assessment in 2025/26.
6. When the TACs for kingfish stocks were last reviewed in 2020, the Minister considered it was appropriate that commercial catch be managed at unavoidable non-target levels only. The options developed for KIN 7 & KIN 8 continue that approach. FNZ also considered that as the most recent assessment indicates the stock is experiencing an ongoing period of high abundance, it was appropriate to provide more flexibility for fishers to balance catch with ACE in the event that fish were unable to be released alive.

7. For the pilchard stocks, the primary objective was for the TACCs for the two stocks to better reflect distribution. An additional objective was to review the allowance for all other mortality to the stock caused by fishing.

8. The assessments for JMA 7 and KIN 7 & 8 indicate the stocks are the well above the agreed reference points. For this reason, the proposed setting of the TAC for JMA 7 for the first time, and adjustments to the TACs of KIN 7 and KIN 8, based on the options outlined below, would be made under section 13(2)(a) of the Fisheries Act 1996 (**the Act**). Any changes would apply from 1 October 2024 (the beginning of the next fishing year).

9. As there is no stock status information for PIL 7 and PIL 8, the adjustments to the TACs based on the options outlined below would be made under section 13(2A) of the Act. They would also apply from 1 October 2024.

Table 1: Proposed management options (in tonnes) for JMA 7, KIN 7 & KIN 8, and PIL 7 & PIL 8 from 1 October 2024.

Stock	Option	TAC	TACC	Allowances		
				Customary Māori	Recreational	All other mortality caused by fishing
JMA 7	Option 1 (*Status quo*)	N/A	32,537[1]	N/A	N/A	N/A
	Option 2	34,387	34,037 (↑1,500)	0	10	340
	Option 3	35,902	35,537 (↑3,000)	0	10	355
KIN 7	Option 1 (*Status quo*)	98	44	6	40	8
	Option 2	105 (↑7)	50 (↑ 6)	6	40	9 (↑ 1)
	Option 3	109 (↑11)	54 (↑ 10)	6	40	9 (↑ 1)
KIN 8	Option 1 (*Status quo*)	167	80	19	55	13
	Option 2	179 (↑12)	90 (↑ 10)	19	55	15 (↑ 2)
	Option 3	184 (↑17)	95 (↑ 15)	19	55	15 (↑ 2)
PIL 7	Option 1 *(Status quo)*	165	150	5	10	0
	Option 2	99 (↓ 66)	80 (↓ 70)	5	10	4 (↑ 4)
PIL 8	Option 1 *(Status quo)*	80	65	5	10	0
	Option 2	157 (↑77)	135 (↑ 70)	5	10	7 (↑ 7)

10. FNZ is satisfied that the current deemed value rates for JMA 7, KIN 7 & KIN 8, and PIL 7 & PIL 8 provide sufficient incentives for fishers to balance their catch with Annual Catch Entitlement (**ACE**) (and for fishers to return live kingfish to the water whenever possible), consistent with section 75(2)(a) of the Act and the Deemed Value Guidelines). Therefore, no changes are proposed to the deemed value rates for these stocks at this time. However, FNZ welcomes any feedback on these settings.

11. FNZ acknowledges that if the TACCs of these stocks are varied, subsequent changes in fishing behaviour and the ACE market may result in the need for deemed value rates to be re-evaluated in future.

12. For more information on the current management settings for JMA 7, KIN 7 & KIN 8, and PIL 7 & PIL 8, see the Fisheries Infosite. For general information about fisheries management in New Zealand, see our fisheries management webpage, and our webpage about the Quota Management System (QMS).

[1] The current TACC is 32,536.763 tonnes

Jack mackerel (JMA 7)

13. There are three species of jack mackerel that are managed as a species complex. As fishers are not required to record catch on a species-specific basis, observer data is the key source of information on the three species. The JMA 7 fishery has a high level of observer coverage, with 60-80% of tows being observed since 2012.
14. *Trachurus declivis* (greenback jack mackerel) is the dominant species of mackerel in JMA 7, comprising between two-thirds and three-quarters of the catch. *T. novaezealandiae* (yellowtail, or horse mackerel) comprises most of the remainder of the catch (Moore et al, 2024). The third species, *T. murphyi*, 'Chilean jack mackerel', is currently only taken in small quantities and makes up 1-2% of catch.
15. Stock assessments for all jack mackerel stocks are complicated by the reporting and management of three species under the single JMA code. However, the high level of observer coverage in JMA 7 means that there is a data set available at the species level to use for stock assessment purposes.
16. In 2023 species-specific catch per unit effort (**CPUE**) indices were developed for *T. declivis* (JMD) and *T. novaezealandiae* (JMN) This was the first accepted assessment of any type for this stock and is summarised in the 2023 Plenary.
17. The indices use data from the fleet of large trawl vessels that targets jack mackerel in JMA 7. The vessels are all greater than 46 metres in length, which means they are subject to regulations that impose restrictions on where they operate. As well as being prohibited from operating in the Territorial Sea, trawl vessels greater than 46 m in length are also prohibited from operating in several areas outside the Territorial Sea. The areas referred to are shown in Figure A10 in the Supporting information section.
18. The spatial restrictions that apply to this category of trawl vessel mean that the CPUE data comes from the proportion of jack mackerel habitat that is accessible to this fleet. There is no jack mackerel target trawl fishery that extends throughout the entire range of jack mackerel habitat.
19. The best available information, as published in the 2024 Plenary, indicates that abundance of JMD and JMN began to increase during the mid-2000s and that the increase in abundance has been maintained for approximately the last 10 years (see '*Supporting information*'). This has been used to define options for setting a TAC for this stock for the first time.
20. The information indicates that a utilisation opportunity is available through a modest increase to the TACC, reflecting the ongoing level of abundance.
21. Observer coverage is expected to remain high and the next assessment for JMA 7 is scheduled for the 2025/26 financial year.

Option 1 – retain current settings (*status quo*)

Benefits	It is likely that effort will remain at a similar level to that seen in recent years. This means it is unlikely there will be changes in environmental impacts or non-target catch of other QMS species such as kingfish and snapper. Retaining the *status quo* means that abundance is likely to remain at a relatively high level over the short term at least. This option acknowledges the likely importance of jack mackerel as prey for many different predator species.
Risks	Retaining the *status quo* means forgoing a utilisation opportunity for this stock.

Option 2 – Set a TAC; increase TACC by 1,500 tonnes (4.5%)

Benefits	While increasing the TACC may result in some increase in effort, the number of target tows is expected to remain well below historical levels (refer Figure A 1). Any changes in environmental impacts are likely to be low. The utilisation opportunity resulting from increasing the TACC could result in a modest increase in export revenue (1,500 tonnes is estimated to have an export value of approximately $3M).[2]

[2] The estimate of export revenue is based on the 2023 export value of frozen whole jack mackerel.

Risks	If fishing effort does increase, this could increase the chances of encountering non-target catch of other QMS species such as blue mackerel, as well as species of interest to inshore and recreational fishers such as kingfish and snapper.[3] However, the measures implemented by vessel operators in recent years to minimise catch of kingfish and snapper would continue, which mitigates this risk.

Option 3 – Set a TAC; increase TACC by 3,000 tonnes (9%)

Benefits	As with Option 2, while the number of target tows could increase, overall effort is very unlikely to approach historical levels. Because effort is not expected to increase significantly, environmental impacts such as seabird and marine mammal captures are not expected to increase much from what is already a low level. With 3,000 tonnes of jack mackerel having an estimated export value of approximately $6M, the utilisation opportunity of this option is greater than for Option 2. A further benefit of this option is that vessels may be able to remain in the fishery for longer during the summer season, particularly if other fisheries are not performing well (for example, if it is a poor season in the squid fishery). This part of the fishing year is typically when catch rates are highest.
Risks	This option has the highest likelihood of increasing the non-target catch of other QMS species. However, as well as ongoing efforts by vessel operators to minimise catch of non-target species, FNZ notes that as west coast kingfish and snapper stocks are also included in the October 2024 sustainability round, there may be additional ACE available in 2024/25. This option has a greater risk than Option 2 in terms of impacts on the ecosystem role of jack mackerel species. The risk is still considered low and can be managed by monitoring and responding if impacts are identified.

Kingfish (KIN 7 & KIN 8)

22. Kingfish on the west coast of New Zealand are considered to represent a single biological stock. A partial quantitative stock assessment for the KIN 7 / KIN 8 stock was first developed during 2019 and 2020. It was based on CPUE series derived from observer catch and effort data recorded while observers were on vessels operating in the JMA 7 fishery. This data set was used due to the high level of observer coverage in this fishery as well as the fact that most kingfish catch was taken as non-target catch in the JMA 7 fishery.
23. As with jack mackerel, the CPUE data does not come from the full range of kingfish habitat within KIN 7 / KIN 8.
24. The assessment was updated in 2023, with results summarised in the 2024 Plenary. The assessment indicates that abundance of west coast kingfish increased significantly between 2012 and 2016 and has continued to remain at a high level, well above the interim target (see figure A6 in *Supporting information*). This has been used to define options to set the TAC for the KIN 7 and KIN 8 stocks.
25. The information suggests that a utilisation opportunity exists through an incremental increase to the TACC for both stocks.

Option 1 – retain current settings (*status quo*)

Benefits	This option retains the strong incentives for fishers to release live kingfish wherever possible. Abundance is expected to remain high, at least in the short term.
Risks	Retaining the *status quo* means forgoing the opportunity for additional catch to be balanced with ACE if it cannot be returned to the sea alive. This could result in deemed values being incurred in some years.

[3] The SNA 7 and SNA 8 stocks are both included in the October 2024 sustainability round.

Option 2 – Increase combined TACs by 19 tonnes; increase TACC for KIN 7 by 6 tonnes (14%); increase TACC for KIN 8 by 10 tonnes (13%)

Benefits	This option would be unlikely to change the incentives for fishers to release live kingfish wherever possible. This is because the combined TACCs for both stocks under Option 2 (140 tonnes) would remain well below current overall catch i.e., catch that is retained plus catch that is returned to the water (see '*Supporting information*'). In the three completed fishing years since the last TAC review, overall catch has averaged around 230 tonnes while the retained catch component has averaged around 120 tonnes. The modest increase is consistent with section 13(2)(a) in that the stock is expected to be maintained at or above a level that can produce *MSY*. Retaining incentives for kingfish to be returned wherever possible is consistent with management options developed during the 2020 review i.e., for commercial catches to be managed to non-target levels only in recognition of the value of kingfish to non-commercial fishers. This option reduces the likelihood of fishers being unable to balance catch of fish that is unable be returned to the sea with ACE.
Risks	The proposed TACCs for each stock under Option 2 remain below the catch recorded as landed in some years recently. The increases proposed under this option may therefore not result in all fish unable to be returned to the sea to be balanced with ACE.

Option 3 – Increase combined TACs by 28 tonnes; increase TACC for KIN 7 by 10 tonnes (23%); increase TACC for KIN 8 by 15 tonnes (19%)

Benefits	This option does not differ significantly from Option 2 in terms of changing incentives to release live kingfish. The combined TACCs (149 tonnes) remain well below the average overall catch for the last three years of around 230 tonnes. However, it further reduces the likelihood of fish that cannot be returned to the sea being unable to be balanced with ACE. The higher TACCs proposed under this option also acknowledges that the introduction of onboard cameras could result in more kingfish being retained by inshore fishers rather than being returned to the sea.
Risks	As per Option 2; the proposed TACCs still remain below catch recorded as landed in some years recently. This option may not lead to all retained fish being able to be balanced with ACE. However, the risk of fishers being unable to balance catch with ACE is lower under this option than under Option 2. It is possible that with more ACE available, inshore fishers may choose to retain some fish that would otherwise have been released. This is because kingfish landed as fresh chilled on inshore vessels is a more valuable product than kingfish that is frozen at sea by the fleet targeting jack mackerel.

Pilchard (PIL 7 & PIL 8)

26. Pilchard stocks were introduced into the QMS in 2002. For PIL 7 and PIL 8, the combined TACC was 215 tonnes; 70% of the total (150 tonnes) was allocated to PIL 7 and 30% (65 tonnes) to PIL 8.
27. Since 2002, virtually all recorded catch of both stocks has come from vessels operating in the JMA 7 fishery; 30% of the total catch over that time has come from PIL 7 and 70% has come from PIL 8.
28. The TACCs for PIL 7 and PIL 8 were not based on catch history in the period leading up to QMS introduction because the fleet of vessels that currently operates in the JMA 7 fishery did not become stable until the early 2000s. The fleet that targets jack mackerel off the west coast has comprised some 6-9 vessels per year and sometimes encounters pilchard as non-target catch.
29. Based on the catch information available since 2002, FNZ considers there is an opportunity to align the TACs for PIL 7 and PIL 8 with pilchard distribution in the parts of each QMA where the species is encountered by the pelagic trawl fleet. Very little is known about pilchard distribution in the areas where the pelagic trawl fleet is unable to operate as there is very little recorded catch.

30. As catches of PIL 7 and PIL 8 are known to straddle the QMA boundary, it appears that there may be a single west coast biological stock, although this remains uncertain.

31. The inconsistency between the initial TACCs for PIL 7 and PIL 8 and the subsequent location of pilchard catch has meant that catch has exceeded available Annual Catch Entitlement (**ACE**) for PIL 8 during eight fishing years.[4] In contrast, catch has only exceeded available ACE for PIL 7 once (see '*Supporting information*'). This occurred during the same year when the combined catch of both stocks exceeded the combined TACCs (215 tonnes), the only time this has happened (see '*Supporting information*')

Option 1 – *status quo*

Benefits	While the *status quo* is included as an option, FNZ considers there is little benefit to retaining the current settings.
Risks	The likelihood of fishers unable to balance PIL 8 catch with ACE would remain, as the TACs across both QMAs would not be adjusted based on information available on pilchard distribution across the two QMAs.

Option 2 – increase combined TAC to 256 tonnes; decrease TACC for PIL 7 by 70 tonnes and increase TACC for PIL 8 by 70 tonnes; set the other mortality allowance for both stocks equivalent to 5% of TACC

Benefits	This option is based on the 21 years' worth of catch information that has become available since pilchard stocks entered the QMS in 2002. It would better align the TACs for the west coast stocks with pilchard distribution in the parts of each QMA where the species is encountered by the pelagic trawl fleet. The adjusted TACCs would increase the likelihood of fishers being able to balance PIL 8 catch with ACE in most years based on catches recorded since 2002. As shown in figure A3 in *Supporting information*, catch of PIL 8 has only exceeded the proposed TACC of 135 tonnes twice since 2003. The combined TACC would remain the same. This option also follows through with statements made in 2002 that the allowance for other sources of mortality caused by fishing would be reviewed in future years once more information is available (see '*Fishery characteristics and current settings'*).
Risks	It is acknowledged there is no information other than catch upon which to base the proposed TAC/TACCs and little quantitative information upon which to base options for all other mortality to the stock cause by fishing.

Who is affected by the proposed changes?

32. The JMA 7 commercial fishery is dominated by the pelagic trawl fleet.[5] Over the last five completed fishing years, eight vessels operated by five permit holders have landed 99% of JMA 7, almost all of which was targeted. 96% of JMA 7 catch was received by three LFRs, all of whom are also permit holders with vessels operating in the fishery.

33. End of year ACE holdings align strongly with catch. The five permit holders whose vessels landed most of the catch also held most of the ACE (an average of 99% over the last five years).

34. A similar proportion of the PIL 7 and PIL 8 catch over that same time period was taken by the same fleet. All pilchard catch taken by this fleet is taken as non-target catch in the jack mackerel target fishery; there is no target fishery for pilchard in this area.

35. While the pelagic trawl fleet is also responsible for the majority of kingfish catch (65% of the combined catch (returned and retained) of both stocks over the past five years) other vessels such as inshore trawlers also take kingfish, primarily from KIN 8. A small number of inshore trawlers recorded around

[4] Commercial fishers are required to balance catch of species managed under the QMS with ACE. Any catch that cannot be balanced means fishers are subject to deemed value payments.

[5] This term refers to trawl vessels that use mid-water trawl gear to target primarily jack mackerel off the west coasts of the North and South Islands. In the 2023/24 fishing year the fleet numbers seven vessels.

40% of KIN 8 landings over the last five years. Approximately 120 other vessels have recorded small amounts of KIN 7 or KIN 8 over that time period. Kingfish in this area is rarely targeted.

36. While jack mackerel does not rate highly as a recreational target species for eating purposes, the species are popular as bait. Collectively, baitfish, which is defined in the Fisheries (Amateur Fishing) Regulations 2013 as encompassing koheru, scad, anchovy, piper, jack mackerel, pilchard, sprat, and yellow-eyed mullet, are of strong interest to recreational fishers. Kingfish is also a species of considerable interest to recreational fishers.

Input and participation of tangata whenua

37. Te Hiku o Te Ika, Mid North West, Ngaa Hapuu o Te Uru o Tainui, Te Tai Hauāuru Iwi, Te Tau Ihu, and Te Waka a Māui me Ōna Toka Iwi Forums represent iwi with an interest one or more of these stocks.

38. FNZ circulated a summary of the stocks proposed for review in this round (including JMA 7, KIN 7 & KIN 8, and PIL 7 & PIL 8) to the chairs of the relevant iwi fisheries forums. FNZ invited feedback from the forums and offered to provide more detailed information for any stocks upon request.

39. To date no specific feedback on these three stocks has been received, nor further information requested. FNZ will engage further with the iwi fisheries forums during consultation. FNZ also welcomes any input from tangata whenua outside of this planned engagement.

Fishery characteristics and current settings

Commercial (TACC)
The **JMA 7** stock was introduced into the QMS in 1987 with a TACC of 20,000 tonnes. Over the next 6 years, the TACC was increased as a result of administrative processes undertaken following QMS introduction. A final administrative change in 2001 resulted in the current TACC of 32,536.763 tonnes being set, which has remained unchanged since then. Since 2002/03, catch has ranged between 26,100 tonnes and 36,500 tonnes (see '*Supporting information*').
Settings for kingfish stocks were last reviewed in 2020; TACCs of 44 and 80 tonnes were set for **KIN 7 and KIN 8** respectively. In the three years since, retained catch has exceeded each of the TACCs once; in 2022/23 for KIN 7 and in 2021/22 for KIN 8. The amount of catch recorded as released alive has been broadly equivalent to the amount retained for both stocks over that three-year period (see '*Supporting information*').
The TACCs for **PIL 7 and PIL 8** were set in 2002 when the stocks were introduced into the QMS. The TACC for PIL 7 was set higher than that for PIL 8 in recognition of the fact that as there had historically been a target fishery in and around the Marlborough Sounds, it was thought there could be a future utilisation opportunity in that QMA. The TACCs set in 2002 were based on future utilisation rather than catch history in the years immediately prior to QMS introduction.
In the period following QMS introduction, the JMA 7 fishery became fully developed and vessels in this fishery started encountering pilchard when targeting jack mackerel. Combined catch from both stocks shows considerable variation and has ranged between 25 and 395 tonnes over that time period (see '*Supporting information*'). No target fishery has developed and virtually all recorded catch has been taken by the pelagic trawl fleet while targeting jack mackerel.
Customary Māori
To date, no customary Māori allowance has been set for this stock. Jack mackerel in **JMA 7** has not been recorded in records of customary take. This information may be incomplete, however, as not all customary take is required to be reported.
The current customary Māori allowances of 6 tonnes for **KIN 7** and 19 tonnes for **KIN 8** were set during the 2020 review. They reflected current and future catch. The most recent customary catch data indicates that even allowing for customary take that is not recorded, the existing allowances remain sufficient to provide for current and future catch.
A current customary Māori allowance of 5 tonnes applies to both **PIL 7 and PIL 8**. There is no quantitative information on customary take for this species. FNZ considers the existing allowances remain sufficient to provide for current and future catch.
Recreational
To date, no recreational allowance has been set for **JMA 7**. Results from the 2017/18 (Wynne-Jones et al 2019) and 2022/23 (Heinemann and Gray, in prep) recreational harvest estimates of 6.2 tonnes, and 2.6 tonnes respectively,

have been used to inform the proposed allowance of 10 tonnes. FNZ considers the proposed allowance reflects current levels of recreational take and provides for increased future take.

The current recreational allowances of 40 tonnes for **KIN 7** and 55 tonnes for **KIN 8** were also set during the 2020 review. Information from the 2022/23 recreational harvest estimates research project (Heinemann and Gray, in prep) resulted in estimates of 13 tonnes for KIN 7 and 46 tonnes for KIN 8. On this basis, FNZ considers the existing allowances remain above current levels of recreational catch.

A current recreational allowance of 10 tonnes applies to both **PIL 7** and **PIL 8**. There are estimates of recreational harvests, however this data is in the form of the number of fish rather than weight. Estimates for PIL 8 were ~29,000 fish in 2017/18 and ~11,000 fish in 2022/23. For PIL 7, the estimate was ~10,000 fish in 2017/18. The limited observer data available indicates that the average weight of a pilchard is likely to be in the vicinity of 120 grams. On this basis, the recreational harvest estimates equate to 3.5, 1.3, and 1.2 tonnes respectively, indicating that the existing allowances remain sufficient to provide for current and future catch.

Other sources of mortality caused by fishing

No allowance for other sources of fishing related mortality has been set for **JMA 7**. For other species that are taken by the same vessels e.g. hoki, an allowance that equates to 1% of the TACC is set. FNZ has used the same approach to set the proposed allowance for JMA 7.

Observer coverage in the jack mackerel trawl fishery has been consistently high (60-80%) since 2012 (refer protected species capture website)

The current allowances for other sources of mortality caused by fishing are 8 and 13 tonnes for **KIN 7 and KIN 8** respectively. They were set during the 2020 review and equated to 10% of the TACC and recreational allowances combined for each stock. The approach takes into account the fact that not all kingfish released alive may survive.

The allowances proposed under both options are based on the same approach.

Observer coverage on vessels involved in the jack mackerel trawl fishery has been consistently high (60-80%) since 2012. The inshore trawl fleet operating off the west coast of the North Island and in Tasman / Golden Bays is part of the on-board camera programme . Remaining trawl vessels are subject to a camera rollout date of 3 December 2024.

For **PIL 7 and PIL 8 t**here is currently an allowance of zero tonnes for other sources of mortality caused by fishing. At the time of QMS introduction in 2002, the Ministry of Fisheries noted that it would 'consider setting an allowance in future years once more information is available following the increase in fishing effort that is likely after introduction'.

While there has been no target fishing in the period following QMS introduction, there was an increase in jack mackerel trawl effort, which has resulted in the pilchard catches reported to date.

For Option 2, FNZ proposes this allowance be set equivalent to 5% of the TACC. This is higher than most species taken by the large vessel trawl fleet. However, pilchards are small fish and likely to be less robust than other species encountered. For this reason, FNZ considers it is appropriate to set the allowance at a higher rate. As noted, observer coverage on the jack mackerel trawl fleet is high.

Additional supporting information and legal context

40. There are additional figures and more information on pages 11-16 below which support the above analysis and proposed options.

41. On the following pages (page 17 onward) FNZ has provided a series of tables outlining key matters that support an initial assessment of the proposed changes against provisions of the Fisheries Act 1996. This includes matters relevant to sections 9, 10, 11, and 13 of the Act, as well as mātaitai reserves and other customary management tools which are relevant to the Minister's decision making under section 21(4).

42. For information on the relevance of sections 5 (Application of international obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992), and 8 (Purpose) of the Act, as well as detail on the statutory considerations relevant to TAC decisions, please see the **Legal Appendix** ('*Overview of legislative requirements and other considerations in relation to sustainability measures for the 2024 October round'*) on our consultation webpage.

How to have your say

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

    - Which option do you support for setting or 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?

44. FNZ invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on **Monday 29 July 2024**.

45. Please see the FNZ sustainability consultation webpage 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

Supporting information

Additional figures

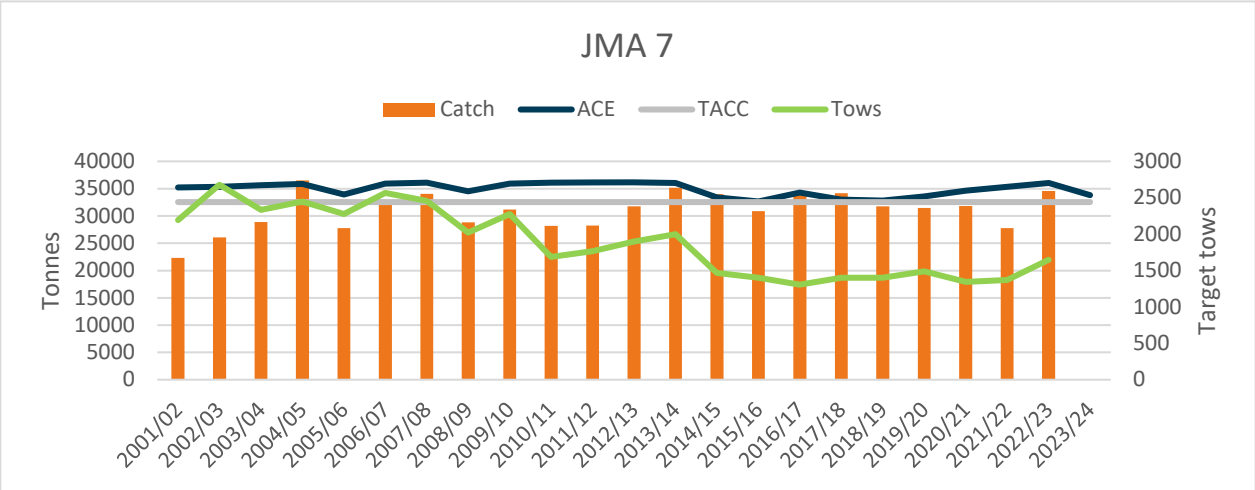


Figure A1. Graph showing catch, total allowable commercial catch (TACC), available ACE (all in tonnes), and number of target tows for JMA 7 since 2001/02

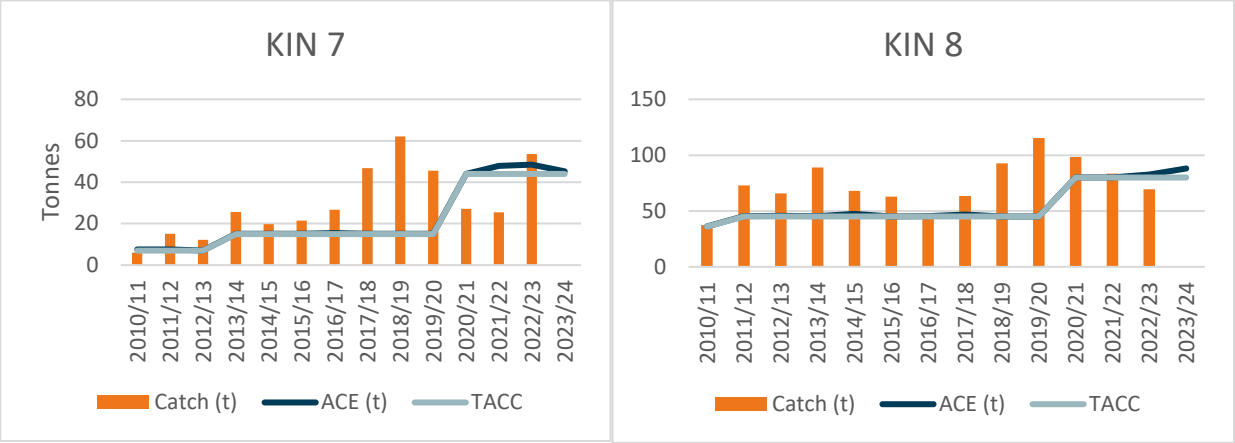


Figure A2. Graphs showing catch, total allowable commercial catch (TACC), and available ACE (all in tonnes) for KIN 7 (left) and KIN 8 (right) since 2010/11

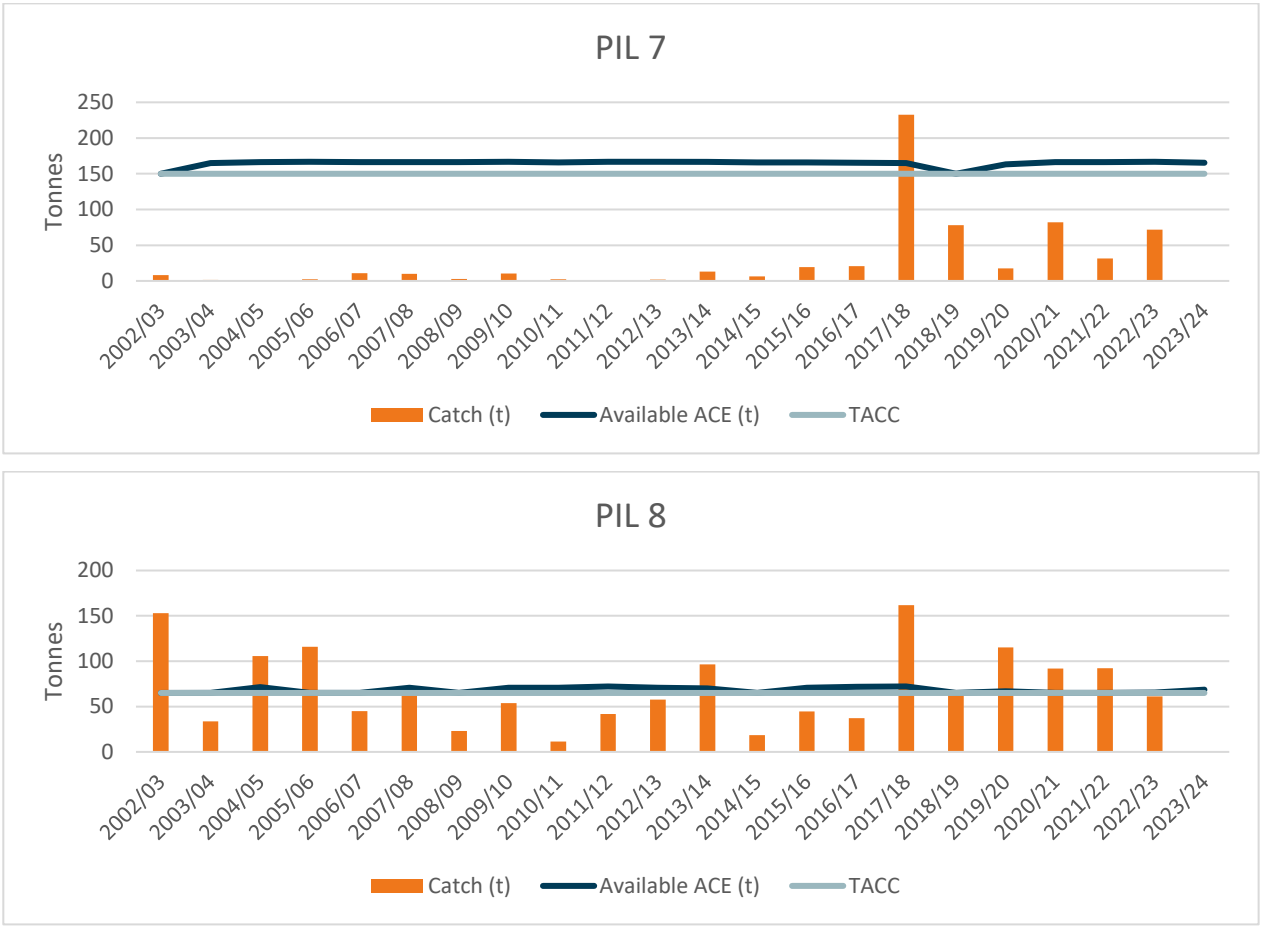


Figure A3. Graphs showing catch, total allowable commercial catch (TACC), and available ACE (all in tonnes) for PIL 7 (upper) and PIL 8 (lower) since pilchard stocks were introduced into the QMS in 2002/03

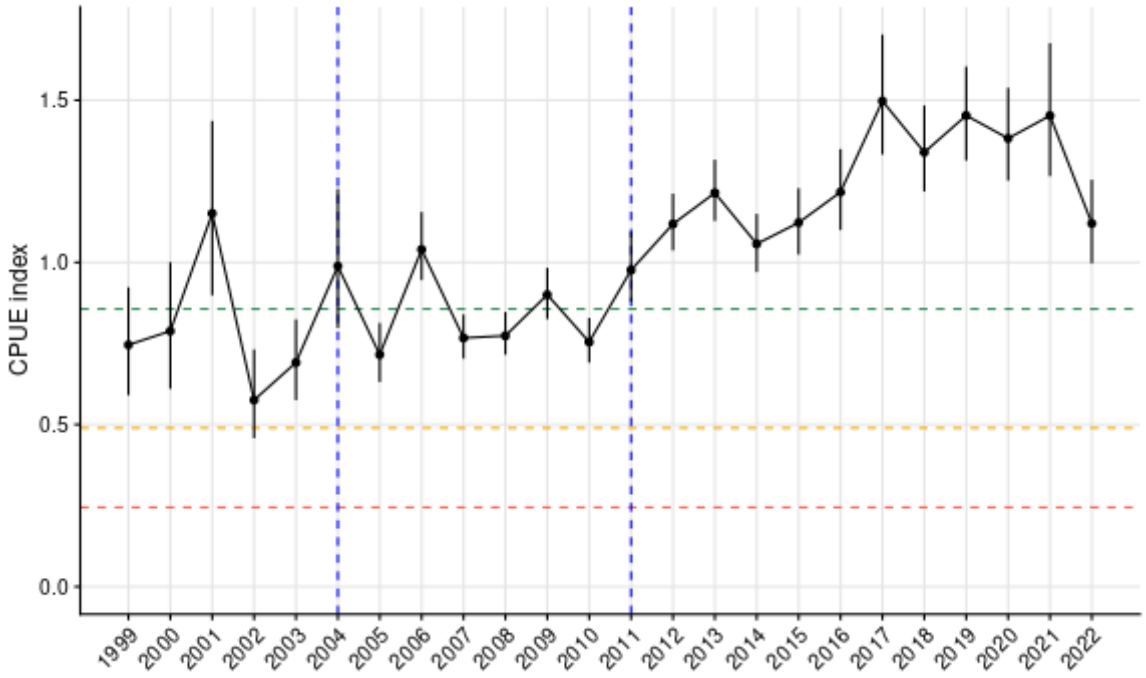


Figure A4. Positive catch standardised catch per unit effort (CPUE) index for ***T. declivis*** in JMA 7 (calculated from observer data using the subset of tows where length frequency sampling permits estimation of catch by species) relative to the agreed conceptual reference points. The green, orange, and red dashed lines represent the interim target, soft limit, and hard limit, respectively.

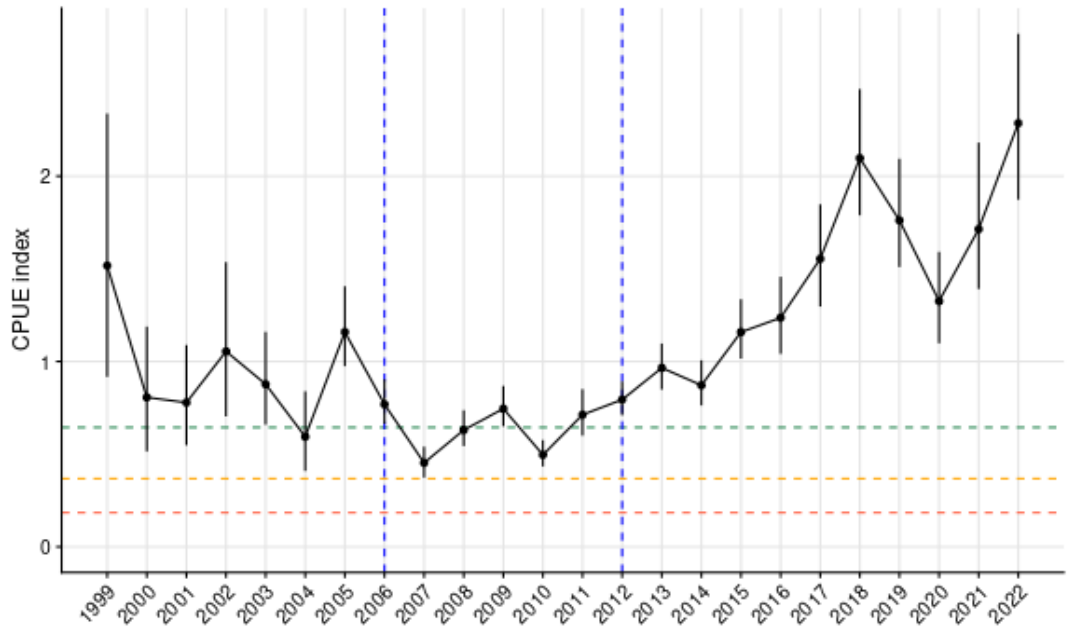


Figure A5. Combined (binomial/positive catch) standardised catch per unit effort (CPUE) index for ***T. novaezealandiae*** in JMA 7 (calculated from observer data using the subset of tows where length frequency sampling permits estimation of catch by species) relative to the agreed reference points. The green, orange, and red dashed lines represent the interim target, soft limit, and hard limit, respectively.

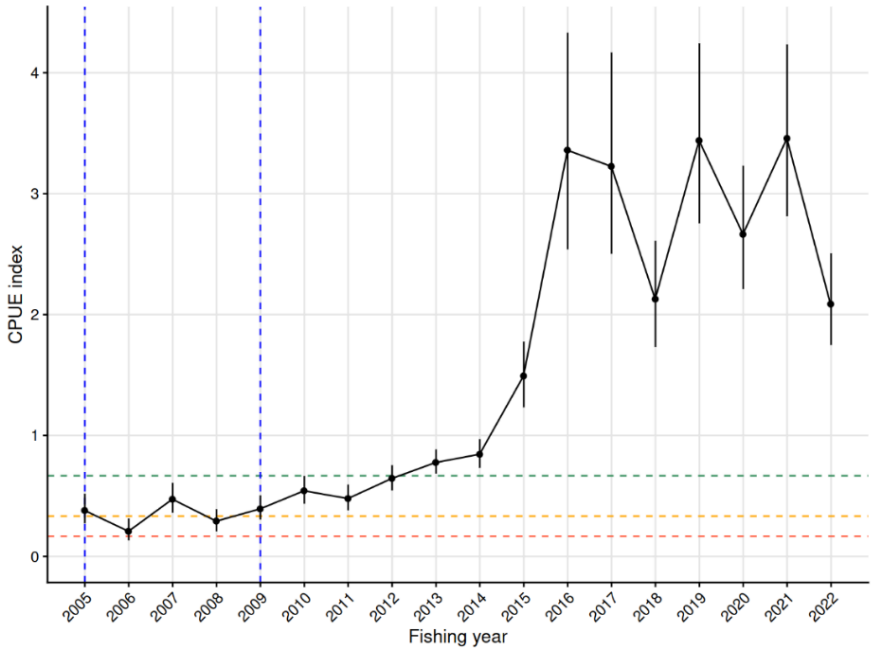


Figure A6. Standardised catch per unit effort (CPUE) index for **KIN 7 and KIN 8** from midwater trawling targeting jack mackerel (observer tow-level index), relative to the agreed reference points, defined by the period indicated between dashed blue vertical lines**.** The green, orange, and red dashed lines represent the interim target, soft limit, and hard limit, respectively.

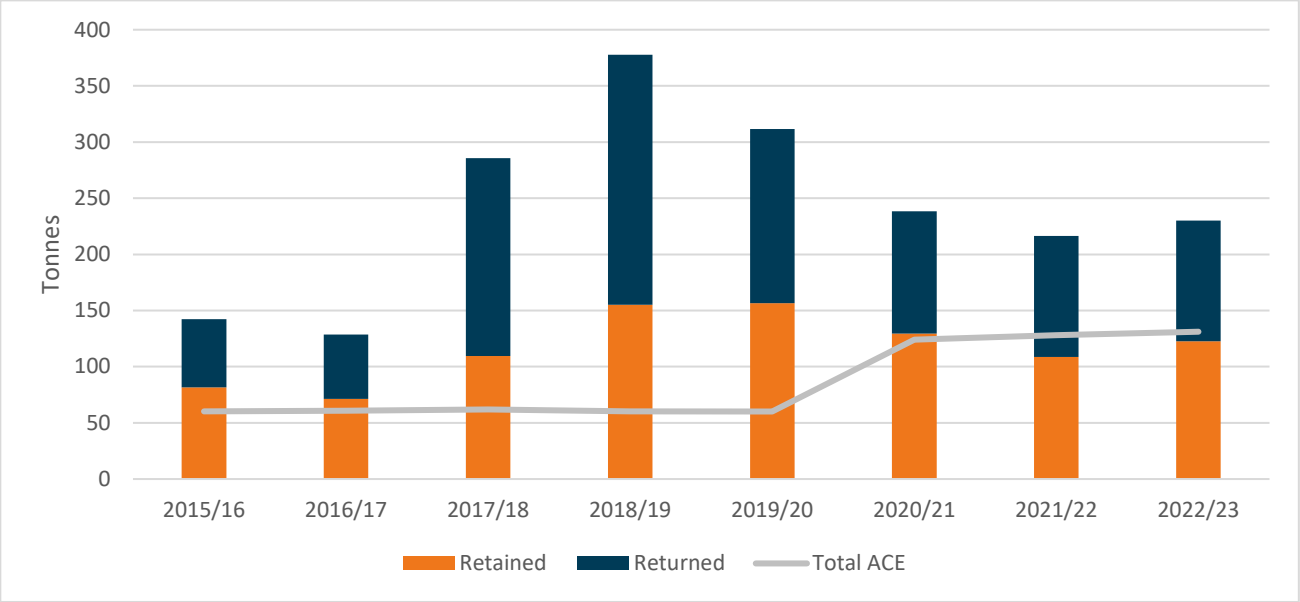


Figure A7. Graph showing quantity of kingfish in KIN 7 and KIN 8 combined that was retained (and balanced with ACE), the quantity that was returned to the sea (including sub-MLS fish), and the sum of available ACE available between 2015/16 and 2022/23.

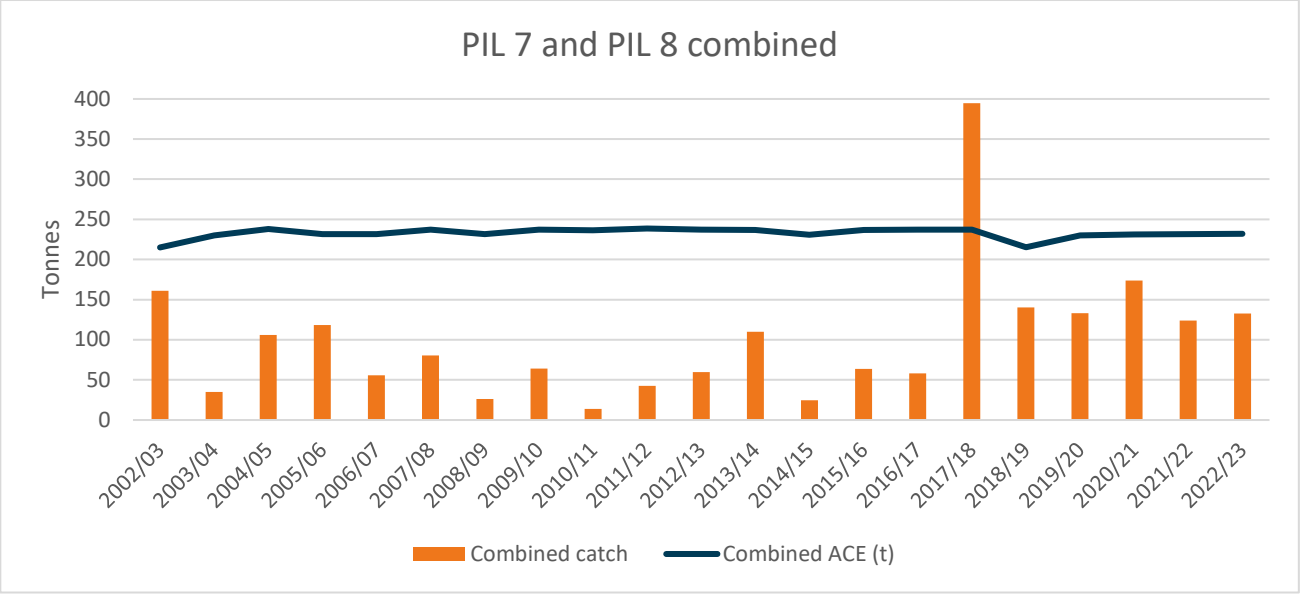
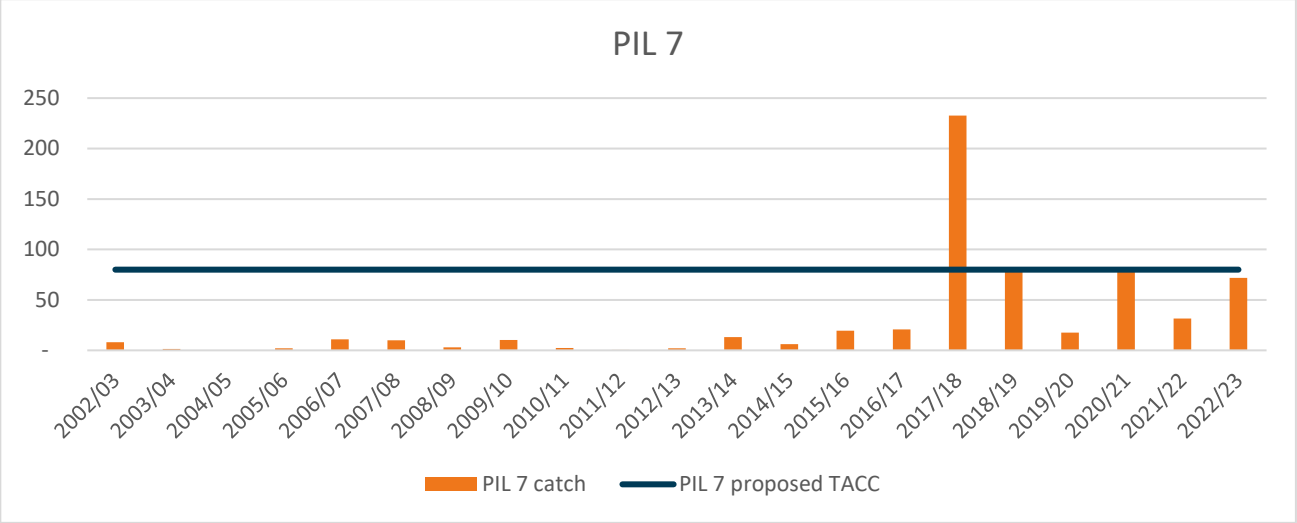


Figure A8. Graph showing annual catch of PIL 7 and PIL 8 (combined), and sum of available ACE for both stocks since QMS introduction in 2002



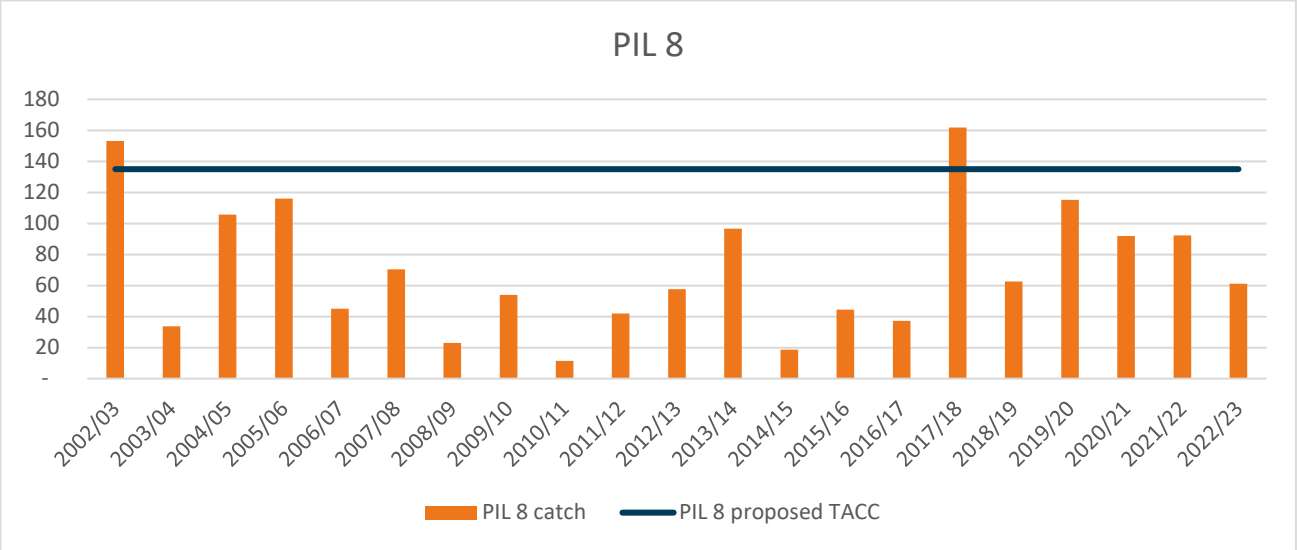


Figure A9. Graphs showing catch of PIL 7 (upper) and PIL 8 (lower) compared to the TACCs proposed under Options 2.

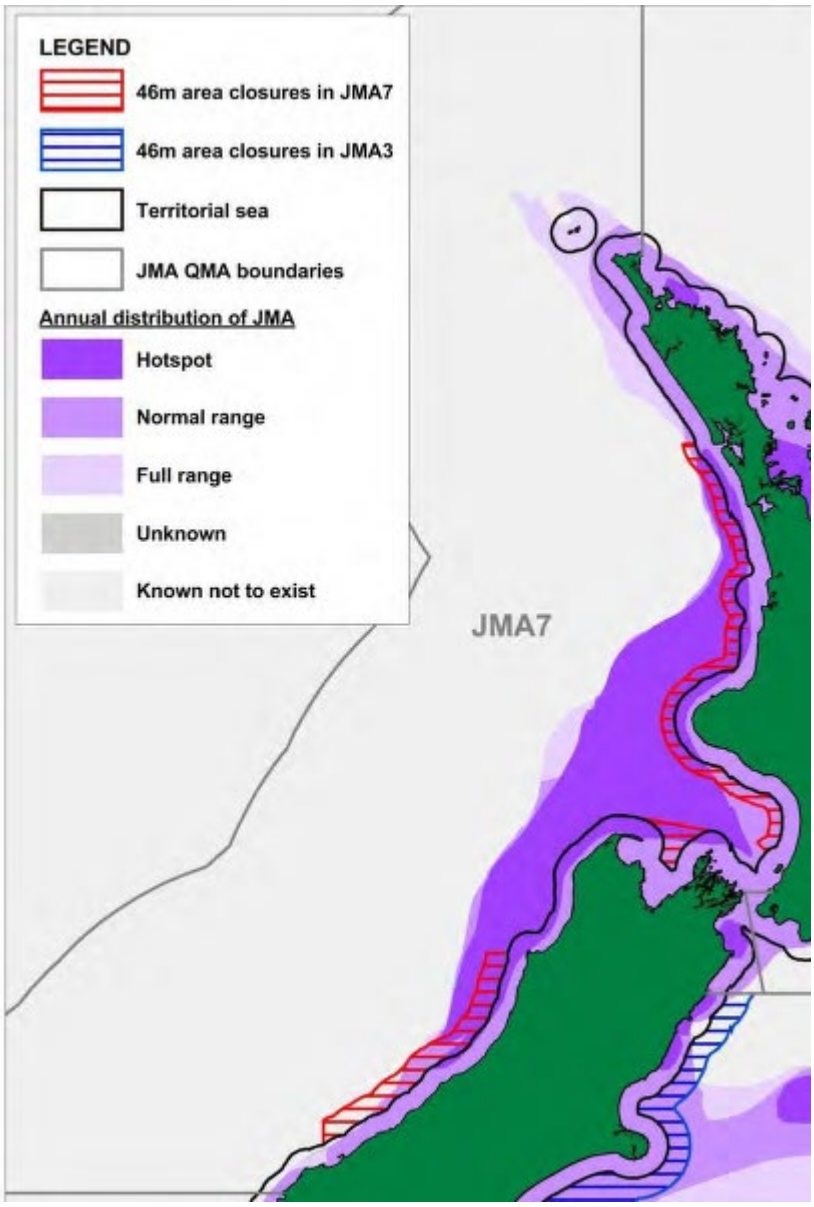


Figure A10. Map showing areas within the JMA 7 QMA (as well as the KIN 7 / 8 and PIL 7 / 8 QMAs) where trawl vessels greater than 46 metres in length are prohibited from operating. The annual distribution of JMA information is a scientific interpretation based in the best available information from published and unpublished sources.

Information on biology, interdependence, and environmental factors

46. This section references the Fisheries Assessment Plenary, May 2024 and the AEBAR. For a more detailed information on the following for these stocks, see the relevant species chapters of these documents.

Biological characteristics

Jack mackerel (JMA 7)

47. There are three species of jack mackerel and fishers are not required to report them separately. The least common species (*T. murphyi*, JMM) currently comprises a very small proportion (<2%) of the overall JMA 7 catch (Moore et al 2024) and is not considered further in this document.

48. *T. declivis* (JMD), the dominant species in the overall JMA 7 catch, grows to a maximum length of around 46 cm and has a maximum age of at least 25 years. *T. novaezelandiae* (JMN), the second most common species, grows to a maximum length of around 35 cm and also has a maximum age of at least 25. The ranges of the two species overlap in the northern parts of JMA 7 (the north and south Taranaki Bights and), however *T. declivis* dominates catch off the west coast of the South Island. Both species have moderate initial growth rates that slow after about 6 years.

49. The stock structure of JMA 7 is not well known, however there may be separate east coast and west coast stocks based on differences in growth rates.

Kingfish (KIN 7 & 8)

50. Kingfish are large predatory fish that can exceed 1.5m in length. They are a fast growing, medium-lived species that reaches sexual maturity around 5-6 years of age. There are thought to be separate stocks off the west and east coasts. Through tagging studies, kingfish are known to move long distances.

Pilchard (PIL 7 & 8)

51. Pilchards are generally found inshore, particularly in gulfs, bays, and harbours. It is a fast-growing and short-lived species that reaches a maximum length of around 25 cm and maximum age of around 9. The main size range is 10-20 cm, and these fish are probably 2-6 years old. The species probably reaches sexual maturity at age 2 and diet consists of invertebrates.

Interdependence of stocks

52. The abundance of **jack mackerels** means they are likely to be prey species for many species of fish, seabirds, and marine mammals. Vessels operating in the JMA trawl fishery cannot operate in areas where vessels greater than 46 m in length are prohibited. A significant proportion of likely JMA habitat is unavailable to the trawl fishery, which contributes to mitigating the relationship between jack mackerels and prey species.

53. Jack mackerel are opportunistic feeders, with their diet comprising predominantly invertebrates such as euphausiids and amphipods. They are known to sometimes eat fish, including pilchard, but fish is not an important contributor to the overall diet.

54. **Kingfish** is a predatory species known to eat a variety of other fish species. FNZ is not aware of any information on the importance of kingfish as a food source to other animals.

55. **Pilchards** are likely to be prey species for many species of larger fish (e.g. kahawai and kingfish), seabirds, such as gannets, and marine mammals, including dolphins.

Environmental conditions affecting the stocks

56. FNZ is not aware of any specific environmental conditions affecting **jack mackerel** in JMA 7.

57. **Kingfish** range has increased in recent years. They have become more common around the South Island, potentially in response to warming ocean temperatures.

58. The distribution of **pilchards** over areas of the outer continental shelf, where they are encountered by the jack mackerel trawl fleet, is likely to be related to interannual variability in environmental conditions. The year with the highest combined catch (395 tonnes in 2017/18) coincided with a large marine heat wave, with sea surface temperatures in some areas well above average. Pilchards were impacted by occasional natural mass mortalities in the 1990s, attributed to a herpes virus.

Relevant provisions of the Act

Key matters for assessment of the proposals against section 13 of the Act

Matters for assessment under section 13(2)(a) of the Act – JMA 7, KIN 7 & 8	
Section 13(2)(a)	For JMA 7 and KIN 7 & 8, biomass can be reliably estimated in relation to *MSY* from their partially quantitative assessments. These assessments indicate that biomass for the two main jack mackerel species, and kingfish, is above the relevant *MSY* reference points. As biomass is estimated to be above *MSY* and there is a desire to maintain the stocks at or above this level, the TACs of JMA 7 or KIN 7 & 8 would be set or varied under section 13(2)(a) of the Act. Under this provision, the Minister must set TACs using best available information, consistent with the objective of maintaining the stocks at or above *MSY*, while having regard to the interdependence of stocks. FNZ's initial view is that all the TAC options proposed for JMA 7 and KIN 7 & 8 would be consistent with the objective of maintaining the stocks above *MSY*. Forward projections are not available to determine precisely where the stocks would be relative to *MSY* following any changes to the TACs, but logically, the lower the TACs are set, the higher the stocks would be maintained relative to *MSY*.
Harvest Strategy Standard	The default Harvest Strategy Standard management target of 40% B_0 (unfished biomass) applies to JMA 7 and KIN 7 & 8. The soft limit is 20% B_0, and the hard limit is 10% B_0. JMA 7 and KIN 7 & 8 are assessed as very unlikely (<10% probability) to be below the hard or soft limits.
Section 13(2)(a) Interdependence of stocks	FNZ considers that the proposed increases to the TACs of JMA 7 and KIN 7 & 8 could have some effect on associated predator and prey species if effort in the associated fisheries increases. However, the proposed TAC changes are not expected to impact effort for KIN 7 & 8, noting they are not targeted by commercial fishers. As noted above, jack mackerel are prey for many species, but it any specific impacts for other species (as a result of an increase to the TAC of JMA 7) are uncertain, and their extent cannot be quantified based on the information available.
Matters for assessment under section 13(2A) of the Act – PIL 7 & 8	
Section 13(2A)	The biomass of PIL 7 & 8 cannot be reliably estimated in relation to *MSY* using the best available information, so section 13(2A) applies when setting or varying the TAC. Under this section, the Minister must set TACs using best available information which are not inconsistent with the objective of maintaining the stocks at or above a level that supports *MSY*, or moving the stocks towards or above and level that can produce *MSY*, while having regard to the interdependence of stocks, the biological characteristics of the stocks, and any environmental conditions affecting the stocks. FNZ's initial view is that all the options proposed for PIL 7 & 8 would be consistent with the objective of maintaining the stocks at or above *MSY*.
Harvest Strategy Standard	The default Harvest Strategy Standard management target of 40% B_0 (unfished biomass) applies to and PIL 7 & 8, in addition to a soft limit of 20% B_0 and hard limit of 10% B_0. However, there is insufficient information to estimate the status of PIL 7 & 8 in relation to these reference points.
Section 13(2A)(b) Interdependence of stocks	FNZ considers that the proposed changes for PIL 7 & 8 could have some effect on associated species (mainly predators) if it leads to changes in fishing behaviour and catch levels. However, the proposed changes are unlikely to significantly impact fishing effort for pilchards, noting they are a bycatch species that is not targeted in these QMAs. Any specific impacts for other species are uncertain, and their extent cannot be accurately quantified based on the information available.
Section 13(2A)(b)	Pilchards are fast growing and short-lived, reaching maturity sooner. This means they are more resilient to changes in fishing pressure than slower growing, longer-lived species, and may be more resilient to fishing pressure.

Biological characteristics of the stock	
Section 13(2A)(b) Environmental conditions	FNZ is not aware of any environmental conditions affecting PIL 7 & 8 which may impact their resilience to the proposed TAC changes. As noted above, abundance of PIL 7 & 8 could be affected by changes in sea temperature or heatwaves, but any specific impacts are unknown, and the extent of these potential impacts cannot be quantified using available information.
Section 13(3) Factors to have regard to in considering the way and rate the stock is moved towards or above B_{MSY}	Section 13(3) is not considered relevant to the TAC decisions for PIL 7 or PIL 8 because the proposed TAC options only aim to maintain the stocks at or above *MSY*. They are not intended to move the stocks to a certain level in a certain way or rate (noting that forward projections are also not available to help FNZ determine what way and rate these options would move the stock in relation to *MSY*).

Mātaitai reserves and other customary management tools

59. When making TAC decisions, the Minister must allow for Māori customary non-commercial interests. In doing so, the Minister must take into account any gazetted mātaitai reserve in FMAs 7-9, and any area closure, fishing method restriction, or prohibition imposed in FMAs 7-9 under section 186A or 186B.

60. For more information on how mātaitai reserves and other customary management tools are relevant for TAC decisions, see heading 2.7 in the Legal Appendix.

Stocks	Mātaitai reserves and other customary management tools
JMA 7 **KIN 7 / KIN 8** **PIL 7 / PIL 8**	There are no customary fisheries management tools such as mātaitai, taiāpure, or Section 186B temporary closures relevant to these proposals. The pelagic trawl fleet that targets jack mackerel and takes pilchard and kingfish as non-target catch is prohibited from operating within 25 nautical miles of most of the North Island and South Island west coasts. Inshore trawl vessels are also subject to restrictions; in much of FMAs 8 and 9 vessels cannot operate within four nautical miles of the coast (more information is available here)

Key matters for assessment of the proposals against section 9 of the Act

61. When considering sustainability measures, the Minister must take into account the below environmental principles. For more information on how section 9 of the Act relates to TAC decisions, see heading 1.4. of the Legal Appendix.

62. The proposals to set a TAC for JMA 7 for the first time and increase the TACC may result in some additional fishing effort. Effort is still expected to remain well below levels seen during the first decade of the 2000s, however. Almost all jack mackerel taken in JMA 7 is targeted.

63. All pilchard, and almost all kingfish taken in west coast fisheries is taken as non-target catch. Pilchard is taken almost exclusively by vessels targeting jack mackerel. While the majority of kingfish is also taken by vessels targeting jack mackerel, inshore trawlers targeting species such as snapper and trevally take over 30% of kingfish in KIN 8.

64. There is not expected to be any change in fishing effort as a result of the proposals relating to KIN 7 & 8 and PIL 7 & 8. The analysis in this section focuses solely on the trawl vessels that target jack mackerel.

Associated or dependent species should be maintained above a level that ensures their long-term viability - Section 9(a) of the Act	
Seabirds	The most recent seabird risk assessment (Edwards et al 2023) indicates the 'mackerel' fishery group poses very little risk to seabirds. Of the top 30 at risk species, the mackerel fleet contributes 1% of risk to one species (white-chinned petrel). The risk is not expected to change with a modest increase in effort that may occur if the TACC increases. The jack mackerel trawl fleet is subject to mandatory requirements to deploy seabird scaring devices. All vessels also have a meal plant and discard very small quantities of material that may attract seabirds. During the last five years four seabird interactions have been recorded by observers, none of which involved birds being caught in the trawl net.
Mammals	The pelagic trawl fleet operating off the west coast occasionally interacts with marine mammals when targeting jack mackerel, primarily common dolphins and fur seals. In the last five completed fishing years a total of five common dolphins and six fur seals have been reported. The low interaction rate is not expected to increase with the modest increase in effort that may occur if the TACC were to increase. When targeting jack mackerel, vessel operators routinely deploy dolphin dissuasive devices on every tow.
Fish and invertebrate bycatch	The most recent report on fish and invertebrate catch in the jack mackerel fishery (Finucci et al 2022) indicated that jack mackerel accounted for 78% of the total estimated catch between 2002 and 2019. The remaining 22% comprised mostly other QMS species including barracouta, blue mackerel, and frostfish. As abundance of kingfish and snapper has increased in recent years, the jack mackerel trawl fleet has implemented initiatives to minimise catches of these two species that are important to both inshore commercial fishers and recreational fishers. Additionally, vessel operators have also implemented measures designed to ensure that if kingfish are caught, as many as possible can be returned alive. These initiatives will continue regardless of any changes to the JMA 7 TACC.
Biological diversity of the environment should be maintained - Section 9(b) of the Act	
The jack mackerel trawl fleet uses mid-water trawl gear exclusively. The gear tends to be fished on or close to the seabed during the day and in the upper part of the water column at night. The use of mid-water trawl gear means benthic impacts are low. Fishing activity is heavily concentrated along previously trawled tow lines. No significant changes in benthic impacts would be expected if effort increased in this fishery. As noted earlier, vessels are prohibited from operating within 25 nautical miles of most of the North and South Island west coasts.	
Habitat of particular significance for fisheries management should be protected - Section 9(c) of the Act	
There is little information available to guide identification of habitats of particular significance for jack mackerel, kingfish, or pilchard. None have been formally identified. Habitat that may potentially be significant for each species is discussed in the table below.	

Potential habitat of particular significance for fisheries management						
Stock(s)	**Potential habitat of particular significance**	**Attributes of habitat**	**Reasons for particular significance**	**Risks/Threats**	**Existing protection measures**	**Evidence**
JMA 7	**Spawning:** jack mackerels (*T. declivis* and *T. novaezelandiae)* are thought to have a protracted spring-summer spawning season. In JMA 7, spawning is known to occur in the North and South Taranaki Bights. **Juvenile and immature**: The Plenary does not contain specific information regarding the distribution of juvenile and immature jack mackerels. Research undertaken in Australia on *T. declivis*, and cited in Morrison *et al* 2014, identified a correlation between size and depth, with smaller fish generally being found inshore and larger fish offshore	Continental shelf down about 150m (*T. novaezelandiae*) or 300m (*T. declivis*) Within JMA 7, it is currently unknown what conditions make the spawning and juvenile habitats favourable for jack mackerel species	Spawning is key to supporting the productivity and recruitment of jack mackerel species. Spawning almost certainly occurs in other areas outside of JMA 7 although stock structure is not well understood. Survival of juveniles to an age where they can reproduce is essential for the productivity of the species.	The importance of environmental conditions to the success of jack mackerel spawning is unknown. It is unknown to what extent fishing activity may impact these habitats.	Much of the continental shelf that may be favoured by juvenile jack mackerel is unable to be fished by trawl vessels greater than 46m in length The fact that no target fishing is able to take place in much of the likely jack mackerel habitat means that there is little information on jack mackerel distribution within much of JMA 7.	Middleton *et al.,* (unpublished) Morrison *et al.,* (2014).
KIN 7 and KIN 8	**Spawning:** likely to occur in a range of settings, from estuaries out to deep water **Juveniles**: juvenile kingfish and their habitats are poorly known	Wide range of substrates down to about 200m water depth.	Limited knowledge of the conditions that make the spawning and juvenile habitats favourable for kingfish	The importance of environmental conditions to the success of kingfish and pilchard spawning is unknown. It is unknown to what extent fishing activity may impact these habitats.	Much of the likely kingfish habitat in KIN 7 and KIN 8 is unable to be fished by trawl vessels	Morrison *et al.,* (2014).
PIL 7 and PIL 8	**Spawning:** nationwide, spawning has been recorded from many coastal regions, including Tasman Bay and the Marlborough Sounds, during spring and summer **Juveniles**: poorly known	Wide range of substrates out to at least 100m water depth	Limited knowledge of the conditions that make the spawning and juvenile habitats favourable for pilchard		Much of the likely pilchard habitat in PIL 7 and PIL 8 is unable to be fished by trawl vessels	Paul *et al.,* (2001).

Key matters for assessment of the proposals against section 11 of the Act

65. Section 11 of the Act sets out various matters that the Minister must take into account (sections 11(1) and 11(2A)) or have regard to (section 11(2)) when setting or varying sustainability measures such as the proposed TAC changes. The matters relevant to this review under section 11 are set out below. For more information on how section 11 is relevant for TAC decisions, see heading 2.2 in the Legal Appendix.

Effects of fishing on any stock and the aquatic environment – section 11(1)(a)	There are no sustainability concerns for any of the species that are taken as non-target catch in jack mackerel target tows in JMA 7, including kingfish and pilchard. The relationship between the jack mackerel target trawl fishery and the aquatic environment is outlined in the table above.
Existing controls that apply to the stock or area – section 11(1)(b)	The primary commercial controls that apply to the stocks addressed in this paper relate to kingfish; there is currently a minimum legal size of 65 cm and fishers may return live kingfish of legal size (unless taken using a set net). The review of these controls must be completed by the end of September 2026. The spatial management measures that apply to trawl vessels greater than 46 m in length have been outlined earlier (refer Figure A10). The recreational controls that apply include: • The daily 'baitfish' limit of 50 per person per day applies to jack mackerel and pilchard • A daily limit of three kingfish per person per day in KIN 7 and KIN 8, and a minimum legal size of 75 cm There are no relevant customary controls that apply to any of the stocks addressed in this paper.
The natural variability of the stock – section 11(1)(c)	• The abundance of jack mackerel species in JMA 7 appears to have been stable for the last few years. • After undergoing a period of increased abundance prior to about 2015, kingfish in KIN 7 and KIN 8 appear to have been stable since then. • While catches of pilchard in PIL 7 and PIL 8 have shown considerable fluctuation over time, it is unclear whether this variability is due to overall abundance or whether it relates to distribution. All catch data comes from vessels operating at least 25 nautical miles offshore. If pilchard schools do not venture this far offshore during a particular fishing year, there will be no catch data.
Relevant statements, plans, strategies, provisions, and documents - section 11(2)	There are six North Island[6] and four South Island[7] Regional Councils or Unitary Authorities that have coastline within the boundaries of FMAs 7-9. Each of these regions has multiple plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats. Each of these regions have policy statements and plans to manage the coastal and freshwater environments, including terrestrial and coastal linkages, ecosystems, and habitats. The provisions of these various documents are, for the most part, of a general nature and relate to the maintenance of healthy and sustainable ecosystems to provide for the needs of current and future generations. There are no provisions specific to these stocks. FNZ has reviewed the documents and the provisions that might be considered relevant. A summary of these can be found on our website here. FNZ considers the options in this paper are all consistent with the objectives of these relevant plans.

[6] Northland Regional Council, Auckland Council, Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council (Manawatu-Wanganui Region) and Greater Wellington Regional Council.
[7] Marlborough District, Nelson City, Tasman District, and West Coast Regional Council

Relevant services or fisheries plans – section 11(2A)	• Jack mackerel in JMA 7 is managed as a Tier 1 stock within the National Fisheries Plan for Deepwater and Middle-depth fisheries 2019 - part 1A.
	• The National Deepwater Plan sets out a series of Management Objectives for deepwater fisheries, the most relevant to the JMA 7 stock being:
	  • **Management Objective 1:** Ensure the deepwater and middle-depth fisheries resources are managed so as to provide for the needs of future generations.
	  • **Management Objective 4:** Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy or reference points.
	• The National Deepwater Plan is a formally approved section 11A plan, which the Minister must take into account when making sustainability decisions. The proposed options for JMA 7 are consistent with the Management Objectives in the plan, including those outlined above.
	• Additionally, a Jack Mackerel Fisheries Plan chapter was finalised in 2013. It is not a formally approved section 11A plan. The chapter contains a number of operational objectives designed to contribute to the Management Objectives in the National Deepwater Plan.
	• Kingfish and pilchard are managed under the National Inshore Finfish Fisheries Plan, which is also a formally-approved section 11A plan. In that plan, kingfish is a Group 2 species and pilchard is a Group 3 species.
	• The Inshore Plan recognises that for Group 2 stocks, the stocks are managed to provide for moderate levels of use with moderate levels of information to monitor stock status (e.g., partial quantitative assessments).
	• Group 3 stocks are managed to provide for lower levels of use, with lower levels of information to monitor their status. Stocks are monitored against trends in catch over time, and any other relevant information.
	• FNZ considers the options for kingfish and pilchard stocks are consistent with what is outlined in the Inshore Plan.

Other plans and strategies	Te Mana o te Taiao (Aotearoa New Zealand Biodiversity Strategy) • FNZ considers that the sustainability measures proposed for all stocks are generally consistent with relevant objectives of the Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy – including Objective 10, which is to ensure that ecosystems are protected, restored, resilient and connected from mountain tops to ocean depths; and Objective 12, which is to manage natural resources sustainably.

Information principles: section 10 of the Act

66. The best available information relevant to this review of JMA 7, KIN 7 & 8, and PIL 7 & 8 is presented throughout this paper, and uncertainties in the information have been highlighted where relevant. The table below provides an additional summary of the best available information and key areas of uncertainty, unreliability, or inadequacy in information for these stocks. As per section 10(c) of the Act, caution is required in decision making where information is uncertain, unreliable, or inadequate. However, as per section 10(d) of the Act, the absence of, or any uncertainty in, any information must not be used as a reason for postponing or failing to make a decision.

67. For more information on how section 10 is relevant for TAC decisions, see heading 1.5 in the Legal Appendix.

Stock	Best available information	Areas of uncertainty
Jack mackerel JMA 7	FNZ considers that the information presented in this paper represents the best available information. Observer data has been used to derive the CPUE indices for *T. declivis* and *T. novaezealandiae*.	All JMA research projects that use observer data highlight ongoing issues with observers' ability to consistently identify the three different species of jack mackerel. The stock assessment took this into account and excluded data from trips with apparent misidentification of jack mackerel species. Information that the stock assessment is based on does not come from the full range of *T. declivis* and *T. novaezealandiae* distribution.
Kingfish KIN 7 and KIN 8	FNZ considers that the information presented in this paper represents the best available information. The data used to derive the CPUE indices for kingfish comes from information recorded by observers.	CPUE for the latter part of the time series may have been affected by attempts by jack mackerel vessel operators to avoid catching kingfish and snapper. The biological data recorded by observers comes from fish that are not released alive. It is unclear how representative this data is.
Pilchard PIL 7 and PIL 8	FNZ considers that the information presented in this paper represents the best available information. The fisher-reported catch information used to inform the TAC options comes from a fleet of vessels with a high rate of observer coverage.	There is no information on pilchard abundance. Catch data is only available from the areas where the jack mackerel trawl fleet operates.
All stocks	Over the last five fishing years an average of 70% of tows in the jack mackerel trawl fishery were observed.	

References

Edwards, C.T.T; Peatman, T.; Goad, D.; Webber, D.N. (2023). Update to the risk assessment for New Zealand seabirds. New Zealand Aquatic Environment and Biodiversity Report 314.

Finucci, B.; Anderson, O.F.; Edwards, C.T.T. (2022). Non-target fish and invertebrate catch and discards in New Zealand jack mackerel trawl fisheries from 2002-03 to 2018-19. New Zealand Aquatic Environment and Biodiversity Report 279.

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 (2024). Fisheries Assessment Plenary, May 2024: stock assessments and stock status. Compiled by the Fisheries Science Team, Fisheries New Zealand, Wellington, New Zealand. 1941 p. Accessible at: https://www.mpi.govt.nz/dmsdocument/62763-May-2024-Volume-2-Horse-Mussel-to-Red-Crab

Heinemann, A.; Gray, A. (in prep). National Panel Survey of Marine Recreational Fishers 2022-23. New Zealand Fisheries Assessment Report.

Middleton, D.A.J.; Neubauer, P.; Wells, R.H.; Starr, P.J. (in prep). Characterisation and CPUE analyses for jack mackerels in the JMA 7 fishery. New Zealand Fisheries Assessment Report.

Moore, B.R.; Ó Maolagáin, C.; Spong, K.; Barnes, T. (2024). Commercial catch sampling for species proportion, sex, length, and age of jack mackerels in JMA 7 in the 2021/22 fishing year, with a summary of all available data sets. New Zealand Fisheries Assessment Report 2024/08.

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 125.

Paul, L.J.; Taylor, P.R.; and Parkinson D.M. (2001). Pilchard (*Sardinops neopilchardus*) biology and fisheries in New Zealand, and a review of pilchard (*Sardinops*, *Sardina*) biology, fisheries, and research in the main world fisheries. New Zealand Fisheries Assessment Report 2001/37.

Wynne-Jones, J.; Gray, A.; Heinemann, A.; Hill, L.; Walton, L. (2019). National Panel Survey of Marine Recreational Fishers 2017-2018. 104p. New Zealand Fisheries Assessment Report 2019/24.