Fisheries New Zealand
Tini a Tangaroa

Review of Sustainability Measures for Kingfish (KIN 2, KIN 3, KIN 7 and KIN 8) for 2020/21

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Kingfish (KIN 2, 3, 7 and 8)

Seriola lalandi; Haku

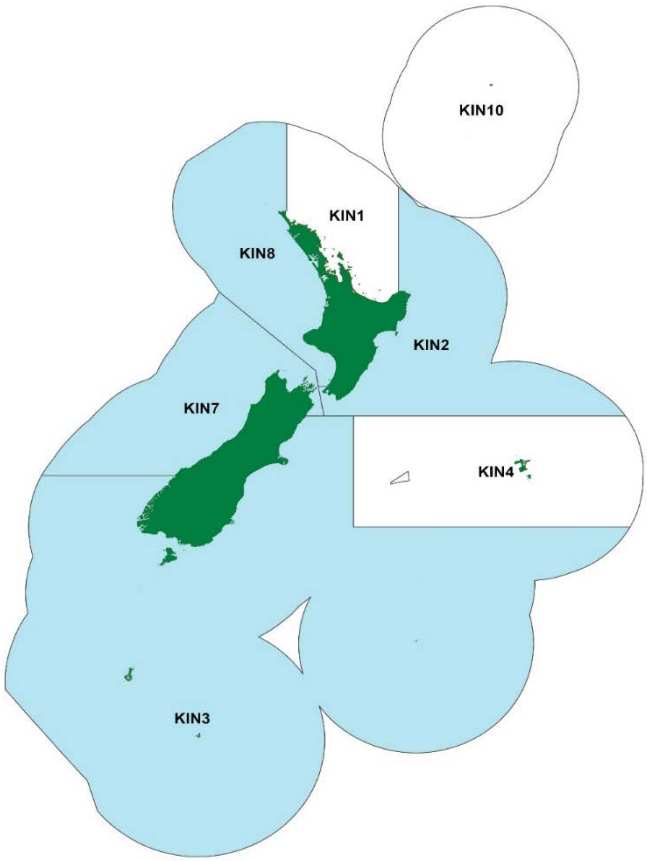

Figure 1: Quota Management Areas (QMAs) for KIN 2, 3, 7 and 8

2. Summary

1. Fisheries New Zealand is reviewing sustainability measures for kingfish in Quota Management Areas (QMAs) KIN 2, 3, 7 & 8 for the 1 October 2020 fishing year.
2. Prized for their large size and sporting attributes, kingfish are a very important species to recreational fishers. Kingfish are also taken as unavoidable bycatch in commercial trawl and set net fisheries targeting other species.
3. Upon introduction to the QMS in 2003, both the recreational allowances and commercial catch limits of kingfish were set lower than pre-QMS levels due to concerns regarding sustainability, and to provide an opportunity for abundance to increase.
4. Recent on-the water experience, supported by standardised catch per unit effort (CPUE) indices suggests this approach has been successful, with best available information strongly suggesting that the abundance of kingfish has increased nationwide.
5. In addition, increases in average sea surface temperature around New Zealand have likely made southern regions more habitable for kingfish, with both commercial and recreational fishers reporting increasing kingfish catches from as far south as Stewart Island.
6. The increased abundance of kingfish has resulted in increased catches across all sectors. The recreational take of kingfish exceeds the recreational allowance for a number of stocks, and catch in excess of the available ACE has resulted in significant deemed value obligations for commercial fishers.
7. Having regard to the importance of kingfish to all sectors, and therefore the socio-economic benefits associated with harvesting, Fisheries New Zealand proposes to increase the total

allowable catch (TAC) of KIN 2, 3, 7 & 8. Proposed options for change are provided in Table 1 below and would broadly retain the current proportional allocation of the TAC between sectors.

8. Given the current status of the stocks, Fisheries New Zealand does not consider it appropriate to introduce additional management controls to constrain recreational catches to the current allowance (e.g. through a reduction in bag limit) or commercial catches to the current TACC (e.g. though an increase in deemed value rates or an overfishing threshold). Therefore, a modified status-quo, which would provide for the increased customary take but retain the current recreational allowance and TACC has not been provided as an option for any stock. However such an option remains available to the Minister and submitters may wish to comment on it.

9. As the proposals would set the kingfish TACCs around, or below current commercial catch levels, the options are considered unlikely to result in either the initiation of a commercial fishery targeting kingfish, or an increase in the amount of commercial fishing effort targeting other species. Therefore, the environmental impacts of the proposed options are likely to be negligible.

10. Fisheries New Zealand notes that there are a range of options that may be considered for the management of kingfish stocks, in the light of new information on abundance. To inform final advice, Fisheries New Zealand seeks information from tangata whenua and stakeholders regarding their views on what management approaches should be considered, particularly regarding the appropriateness of the default target, the proportional allocation of the TAC between the sectors, and the deemed value rates applicable to kingfish.

Table 1: Proposed TACs, TACCs, and allowances for KIN 2, 3, 7 and 8. All figures in tonnes, with percentage changes from current settings provided in brackets.

Stock	Option	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
				Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 2	Option 1	189 ↑ (11%)	70 ↑ (11%)	21 ↑ (17%)	79 ↑ (22%)	19 ↓ (21%)
KIN 3	Option 1	21 ↑ (24%)	9 ↑ (50%)	4	6	2 ↑ (100%)
	Option 2	23 ↑ (35%)	11 ↑ (83%)	4	6	2 ↑ (100%)
KIN 7	Option 1	82 ↑ (100%)	30 ↑ (100%)	4 ↑ (100%)	40 ↑ (100%)	8 ↑ (100%)
	Option 2	122 ↑ (198%)	44 ↑ (193%)	6 ↑ (200%)	60 ↑ (200%)	12 ↑ (200%)
KIN 8	Option 1	167 ↑ (77%)	80 ↑ (77%)	17 ↑ (89%)	55 ↑ (77%)	16 ↑ (129%)

3. Quota Management System

11. Kingfish entered the Quota Management System (QMS) in 2003, with a fishing year running from 1 October – 30 September. For more information about the QMS go to https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/.

3.1. History

12. Upon introduction to the QMS, there were concerns that the abundance of northern stocks (the core distribution of kingfish), including KIN 2 & 8, may have declined over time and may decline further if current landings were maintained. Therefore, to ensure sustainability, the TACs of all kingfish stocks were set at low levels so as to provide a reasonable opportunity for the biomass to increase.

13. To appropriately mitigate the risk of a further decline in abundance, the TACCs and recreational allowances of northern stocks, including KIN 2 & 8, were set 20% below estimates of pre-QMS landings. The TACCs and recreational allowances of more southerly stocks (at the edge of kingfish range), including KIN 3 & 7, were set at the level of pre-QMS landings.

14. Since 2003, the TACs of KIN 3, 7 & 8 have been increased to reflect increased catches across all sectors (Table 2). No changes have been made to the TAC, TACC or allowances of KIN 2 since introduction to the QMS.

Table 2: Summary of TAC reviews for KIN 3, 7 & 8

Stock	Initial TAC (t)	Current TAC (t)	Change effective from
KIN 3	3	17 (↑ 14 t)	1 October 2018
KIN 7	21	41 (↑ 20 t)	1 October 2013
KIN 8	83	92 (↑ 11 t)	1 October 2011

15. The TAC reviews shown above have largely retained the original (2003) proportional split in the allocation of the TAC between the TACC and other allowances (Figure 2).

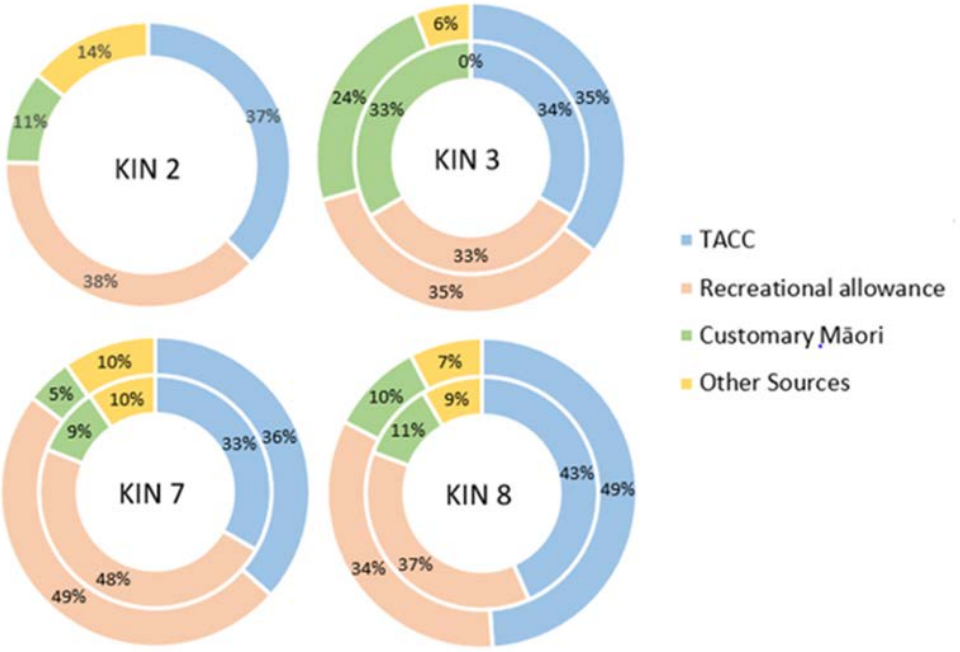

Figure 2: Proportion each sector comprises of the TAC both prior to, and following, the changes to the TACs of KIN 2, 3, 7 & 8. Inner circle represents the TAC upon introduction to the QMS in 2003; the outer circle represents the current TAC. Note that percentages may not sum to 100% due to rounding.

3.2. Deemed values

16. To reflect the value of the stocks to non-commercial fishers, the deemed value rates of all kingfish stocks are set above the landed price so as to provide a strong incentive for commercial fishers to avoid kingfish (where possible) and return any live kingfish to the sea (Schedule 6 conditions permitting).

17. The current deemed value rates of KIN 2, 7 and 8 are essentially unchanged from the initial rates upon introduction to the QMS.[1] The deemed value rates of KIN 3 were reduced by 50% from 1 October 2019.

[1] Although the interim deemed value rates and the differential schedule have been reviewed, the annual rate, the rate at each step on the differential schedule and the rate at maximum excess are the same as those from 2003. The deemed value rates of KIN 2 were also reduced by 50% from 1 October 2004, before reverting to the original settings from 1 October 2013.

3.3. Other management settings

18. Since 2006, kingfish have been listed on Schedule 6 of the Act which allows commercial fishers to return live kingfish to the sea providing that the fish are likely to survive and are returned to the sea as soon as practicable. Schedule 6 contributes towards constraining commercial landings to the available ACE by providing an additional mechanism for commercial fishers to limit their landings of kingfish. However, kingfish caught using the method of set netting are not permitted to be returned to the sea under Schedule 6.

19. Both commercial and non-commercial fishers are subject to minimum legal size limits, set at 65 cm for commercial fishers and at 75 cm for non-commercial fishers.

20. Non-commercial fishers in all areas are limited to three kingfish per person per day, as part of a hapuku/kingfish daily bag limit.

21. Fisheries New Zealand notes that a review of Schedule 6, and commercial minimum legal size limits is currently underway through the Fisheries Change Programme.

4. Legal basis for managing fisheries in New Zealand

22. 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.fisheries.govt.nz/dmsdocument/40502 for more information.

5. Treaty of Waitangi obligations

5.1. Input and participation of tangata whenua

23. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose.

24. Due to COVID-19 travel restrictions, input and participation from Iwi Fisheries Forums was sought through remote mechanisms. In late April 2020, a two-page document with information on the proposal to review these kingfish stocks was provided to Iwi Fisheries Forums electronically, and input sought.

25. Te Hiku o te Ika (far North) commented that more technical information (i.e. CPUE analyses) were required to determine a level of comfort with the proposed changes.[2]

26. Nga Hapu o te Uru (Waikato) noted that kingfish are an important species and did not support the proposed changes as they were not observing the increase in abundance in everyday life.

27. Mai Paritu tae atu ki Turakirae (East Coast North Island to South Wairarapa) commented that bycatch concerns were not evident for all commercial fishers in the area and suggested maintaining the status-quo, with any extra catch used for Pātaka.[3]

28. Te Tai Hauauru (Taranaki and Manawatu) supported the proposed changes provided that the best information was used so as to ensure sustainability. Te Tai Hauauru also noted that kingfish is a significant and growing component of the Pātaka operating in Te Taihauauru Forum area and commented that Pātaka operations would be expanded to supply fish to families in need post COVID-19. Therefore, customary allowances should reflect future need rather than past catches.

29. Given the disruption to services, the opportunity for input from the Iwi Fisheries Forums has been impacted and any further input will be included in the final advice and recommendations provided to the Minister.

[2] As the CPUE analyses described in this paper were not finalised until mid-May, this information was not included within the documents provided to Iwi Fisheries Forums.

[3] Customary catch taken through the exercising of customary permits on commercial vessels.

5.2. Kaitiakitanga

5.2.1. Iwi Fisheries Forum Plans

30. Information provided by Iwi Fisheries Forums and their views on the management of fisheries resources and fish stocks, as set out in Iwi Fisheries Plans, are the way that tangata whenua exercise kaitiakitanga in respect to fish stocks. Particular regard must be given to kaitiakitanga when making sustainability decisions.

31. The Mai I Nga Kuri A Wharei Ki Tihirau (Bay of Plenty), Nga Hapu o te Uru o Tainui (Waikato and west coast North Island), Rangitaane (North Island), Te Hiku o Te Ika (far North), Te Tai Hauāuru (Taranaki and Manawatu) and Te Waka a Māui me Ōna Toka (South Island) Iwi Fisheries Forums represent iwi with an interest in kingfish within the stocks under review.

32. Kingfish is explicitly identified as taonga species in Te Hiku o Te Ika, the Mai I Nga Kuri A Wharei Ki Tihirau and Nga Hapu o te Uru o Tainui Iwi Fisheries Forum Plans.

33. Rangitaane and Te Taihauāuru Iwi Forum Fisheries Plans do not provide a full list of taonga species, however the scope of the plans covers all fisheries managed within the represented areas and specific objectives are provided in respect of commercial fisheries.

34. Kingfish is not explicitly listed as a taonga species in Te Wai Pounamu Iwi Forum Fisheries Plan, however Te Waka a Māui me Ōna Toka Iwi Forum consider all species taonga.

35. Generally speaking, these Plans reflect objectives for creating thriving customary and non-commercial fisheries that support the cultural well-being of iwi and their whanau. This will be achieved through measures such as enabling iwi to collect fisheries resources, according to their tikanga, through their takiwā/rohe, and utilisation of tikanga in the wider management of fisheries.

36. The options presented within this paper aim to contribute towards kaitiakitanga and provide for the rights and interests for Māori with respect to kingfish. However, Fisheries New Zealand would welcome further input from tangata whenua so as to inform final advice on the management of kingfish in KIN 2, 3, 7 & 8.

5.2.2. Customary fisheries areas

37. Mataitai reserves, taiāpure and temporary closures are customary management tools that provide for kaitiakitanga. Commercial fishing is not permitted within mātaitai reserves, but recreational and customary fishing is allowed. All types of fishing (commercial, recreational and customary) are allowed in a taiāpure, unless its management committee recommends changes to the fishing rules and the Minister of Fisheries approves them. The Minister is also required to take these into account when making allowances for customary non-commercial fishing interests. A number of mātaitai reserves and temporary closures fall within the quota management areas of the relevant kingfish stocks, including:

- **KIN 2:** the taiāpure of Porangahau and Palliser Bay, and; the mātaitai reserves of Te Hoe, Moremore, Horokaka, Hakihea and Toka Tamure.
- **KIN 3:** the taiāpure of Te Taumanu o Te Waka a Mäui, East Otago, Akaroa Harbour and Oaro-Haumuri; the mātaitai reserves of Motupöhue (Bluff Hill), Lyttelton Harbour/ Whakaraupō, Otakou, Oreti, Waikouaiti, Koukourarata, Moeraki, Waitutu, Waikawa Harbour/Tumu Toka, Waitarakao, Puna-wai-Toriki, Te ahi Tarakihi, Te Kaio, Te Whaka a Te Wera, Waihao and Tuhawaiki; and the Kaikoura-Wakatu Quay temporary closure.
- **KIN 7:** the taiāpure of Whakapuaka (Delaware Bay), and the mātaitai reserves of Tauparikaka, Okuru/Mussel Point, Te Tai Tapu (Kaihoka), Mahitahi/Bruce Bay, Te Tai Tapu (Anatori), Manakaiaua/Hunts Beach, Aotea Harbour and Marokopa.
- **KIN 8:** the taiāpure of Kawhia Aotea.

38. Given that tagging studies indicate that most adult kingfish do not move outside of local areas, and the abundance of kingfish is expected to increase under each option (see respective sections below), the proposed measures are considered unlikely to effect the availability of kingfish within these areas of customary importance.

6. Relevant plans, strategies, statements and context

6.1. Management strategy

39. Due to the value of kingfish to non-commercial fishers,[4] the goal of the overall management framework is to manage commercial catch to unavoidable bycatch levels only. This is achieved through a combination of low TACCs and high deemed value rates.

40. Although a species-specific harvest strategy has not been agreed, Fisheries New Zealand acknowledges that the default reference points, as set out in the Harvest Strategy Standard, may not be appropriate to kingfish given their importance to non-commercial fishers (Table 3).

Table 3: Default reference points, and associated management responses for medium productivity species such as kingfish.

Reference point	Management response
Default target[5] 40% B_0 *(proxy for B_{MSY})*	Stock permitted to fluctuate around this management target. TAC/TACC changes will be employed to keep the stock around the target (with a 50% probability of being at the target)
Soft limit of 20% B_0	A formal time constrained rebuilding plan will be implemented if this limit is reached
Hard limit of 10% B_0	The limit below which fisheries will be considered for closure

41. Given the above, Fisheries New Zealand seeks the views of tangata whenua and stakeholders regarding the appropriateness of the default target, and what alternative reference points should be used to guide the management of kingfish in KIN 2, 3, 7 & 8.

7. Current state of the stocks

7.1. Biological characteristics

42. Kingfish are large predatory fish that can exceed 1.5 metres in length and typically occur in schools varying from tens to hundreds of individuals. Kingfish tend to be semi-pelagic and mainly occur in open coastal waters, particularly areas of high water flow adjacent to reefs or rocky outcrops. However, kingfish are not restricted to these habitats and can sometimes be found in shallow enclosed bays or areas of sandy bottoms.

43. Tagging studies indicate that most adult kingfish do not move outside local areas, with many tag returns close to the release site. However, some tagged fish have been found to move very long distances with some evidence of trans-Tasman movements.

44. Kingfish is a fast growing, medium-lived species that reaches sexual maturity around five to six years of age (McKenzie et al, 2014; Holdsworth et al, 2016). Kingfish is known to be a robust species and, when handled appropriately, likely to survive catch and release by fishers. These characteristics mean that kingfish is regarded as a medium productive species as per the Operational Guidelines for New Zealand's Harvest Strategy Standard

[4] A 1999 study estimated that the relative value (willingness to pay) of kingfish to the recreational sector was three times the commercial value.

[5] The term B_0 refers to unfished biomass. B_{MSY} refers to the stock size that produces maximum sustainable yield.

45. Within New Zealand, it is thought there are separate stocks of kingfish off the west and east coasts (Smith et al, 2004). These stocks are contained within the Tasman current on the west coast, and the east Auckland and east Cape currents on the east coast, with little mixing between them. The east coast stock may be further subdivided into northeast and Hawkes Bay stocks based on limited exchange from tagging studies and parasite marker prevalence.

7.2. Distribution

46. Kingfish are a warm-temperate species and have historically been most abundant in the northern half of the North Island. However, in recent years kingfish have been found more frequently in southern regions, particularly during the summer months when water temperatures are warmer.

47. Recreational catches of kingfish have been reported from Foveaux Strait, whilst commercial fishers and observers have increasingly recorded commercial catches from the Stewart/Snares shelf squid fishery (approx. 130 km south of Stewart Island). The frequency of commercial kingfish catches in southern regions has increased over the last decade (Figure 3).

48. The increased abundance of kingfish in southern regions may be related to the observed increases in the average sea surface temperature around New Zealand in the last decades (AEBAR 2018).

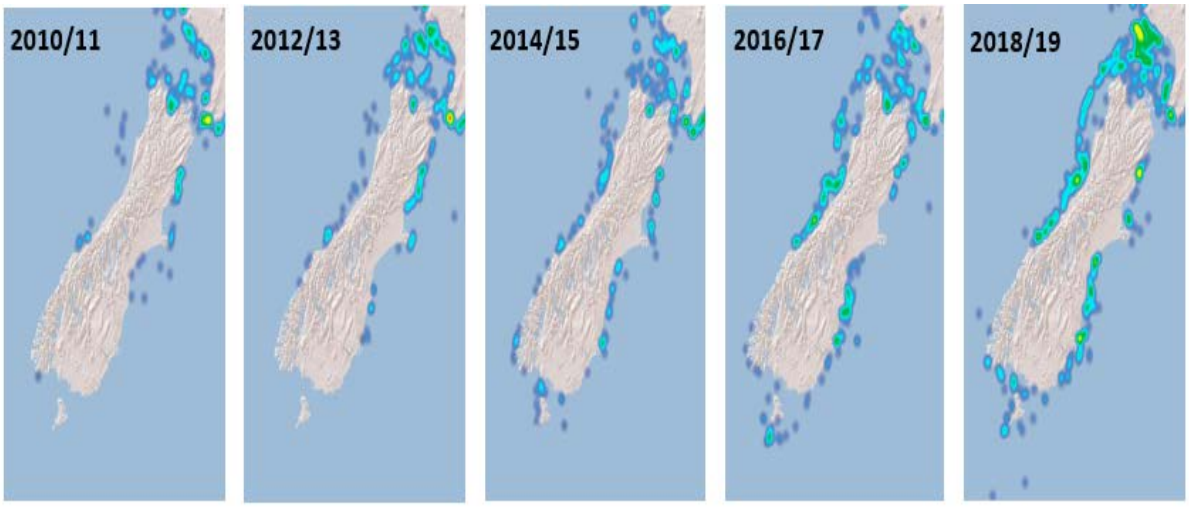

Figure 3: Location of commercial catches of kingfish around the South Island between the 2010/11 and 2018/19 fishing years.

7.3. Stock assessment

49. Standardised catch per unit effort (CPUE) series of relative abundance were developed for KIN 2, 7 & 8 during 2019 and 2020. Standardised CPUE indices have not been developed for KIN 3.

50. For stock assessment purposes, KIN 2 and the Bay of Plenty sub-stock of KIN 1 (BoP) were considered to form part of the same biological population, whilst KIN 7 & 8 were considered to form part of the same biological stock.

51. Multiple CPUE indices were developed using both commercially reported catch effort and landing data, and that recorded by observers. More information on the CPUE indices for specific stocks are provided within the relevant sections below.

52. All kingfish CPUE indices used to inform this review were, presented to, and subsequently accepted by both the Inshore Finfish Science Working Group and Stock Assessment Plenary in 2020.

53. Given the lack of stable periods within the CPUE indices, the Working Group and Plenary concluded that the only defendable approach to determining reference points was to choose stable periods of low abundance early in the series as representing the soft limit. The default Harvest Strategy Standard default target would therefore be set at twice the soft limit.

8. Recent catch levels and trends

8.1. Customary

54. Kingfish (haku) is an important taonga species for Māori. The extent of traditional fisheries for kingfish in the past is described by the Muriwhenua Fishing Report (Waitangi Tribunal 1988). Because of the coastal distribution of the species and its inclination to strike lures, it is likely that historically Māori caught considerable numbers of kingfish and continue to do so today.

55. Customary authorisations can be exercised on commercial vessels, provided that customary catch is kept separate.

56. The level of customary take for each kingfish stock is discussed in the relevant stock specific chapters below. All customary take under customary fishing regulations is required to be reported. However, information on the level of the customary take of kingfish is incomplete as the customary regulations have not yet been implemented in parts of both the North and South Islands. In these areas, customary catch is taken under regulation 50/51 of the recreational fishing regulations, which does not have a reporting requirement.

57. In recent years, the majority of the customary harvest of kingfish in KIN 8 has been taken using commercial vessels. A similar mechanism may be utilised more frequently in other areas in the near future, and this has already been observed in KIN 2 as a result of the recent impacts of COVID-19. Where such a mechanism is utilised, customary harvest of kingfish is likely to increase over the next few years.

58. Fisheries New Zealand seeks further information from tangata whenua so as to inform final advice to the Minister on setting the customary allowance.

8.2. Recreational

59. Due to its large size and sporting attributes, kingfish is a very important species for recreational fishers. Although KIN 1 is the most significant recreational stock,[6] important recreational fisheries for kingfish also exist in KIN 2, 3, 7 & 8.

60. Almost all kingfish (94%) are taken using a rod and line, with smaller amounts taken by spearfishing. The majority of kingfish are taken from private boats or charter vessels with bag sizes for kingfish generally small (most fishers retain a single fish).

61. The National Panel Survey of Marine Recreational Fishers provides the best available information on the recreational harvest of kingfish. The 2017/18 National Panel Survey represents the first estimate of recreational take since 2011/12. However, estimates of recreational harvests are uncertain, and recreational fishing activity can vary between years due to weather conditions and other factors.

62. The National Panel Survey estimated that the total number of recreational fishing trips in 2017/18 was 20% lower than in 2011/12. Despite the decrease in recreational fishing effort, the total estimated national recreational harvest of kingfish increased, from 647 t in 2011/12 to 897 t in 2017/18. Recreational take of kingfish in 2017/18 equated to approximately two thirds of the nationwide catch, with the remaining third (522 t) taken by commercial fishers.[7]

63. There is no available information on the spatial distribution of recreational kingfish catches within QMAs. However, it is likely that almost all recreational kingfish are caught in the territorial sea (i.e. within 12 nm of the coast) with fishing spatially concentrated in areas favourable to fishing (e.g. close to boat ramps in sheltered regions such as the Hauraki Gulf or Tasman/Golden Bay) with most fish taken over the summer months.

[6] The National Panel Survey of Marine Recreational Fishers 2017-18 estimated that 77% of the recreational catch of kingfish during 2017/18 was taken in KIN 1.

[7] Total catch excludes customary take. Commercial catches include sub MLS fish and those released alive under the sixth schedule.

64. Any updated estimates for recreational catch of kingfish will be used to inform future recreational allowance settings. Given the increase in kingfish abundance, no changes to the recreational minimum legal size or the daily bag limit combination are proposed.

65. Stock specific information on the level of the recreational kingfish harvest is discussed in the relevant stock specific sections below.

8.3. Commercial

66. Almost all (>99%) kingfish in KIN 2, 3, 7 & 8 are taken as bycatch by trawl or set net vessels targeting other species.

67. Landings of kingfish from KIN 2, 3, 7 & 8 have regularly exceeded the available ACE during recent years. Given the financial penalties associated with catching in excess of kingfish ACE, and the ability of some fishers to return live kingfish to the sea, Fisheries New Zealand considers that such catches represent genuine unavoidable bycatch.

68. Fisheries New Zealand has received anecdotal information from commercial fishers that the unavailability of kingfish ACE constrains their ability to target other species. Fisheries New Zealand seeks further information on how availability of kingfish ACE impacts fishing activity, so as to determine what impacts the proposed changes will have on other fish stocks and the marine environment.

69. Kingfish landed fresh is a moderately high value species, and is usually sold as fillet or whole chilled. Frozen kingfish processed on board factory vessels is of a considerably lower value than that landed fresh.

70. Stock specific information on commercial kingfish catches, and the fisheries which are responsible for the majority of the catch, is provided in the relevant stock specific chapters below.

8.4. Other sources of mortality to the stock caused by fishing

71. The allowance for other sources of mortality to the stock caused by fishing includes incidental mortality associated with the requirement to return fish below the minimum legal size to the sea, mortality from accidental loss due to damaged or lost fishing gear, and misreporting or illegal take.

72. The approach taken when determining the other sources of mortality allowance differs between stocks. Considerations taken into account include the other management measures applicable to the stock, species and fishery specific factors, and the allowance provided for in other QMAs or for other species that share similar biological characteristics.

73. The extent of other sources of mortality to kingfish caused by fishing have yet to be quantified. However, this allowance is likely to be notable given that:

- a large proportion of both recreationally and commercially caught kingfish are released alive with an unknown proportion subject to post-release handling mortality;
- a minimum legal size applies to both recreational and commercially caught kingfish, and;
- some level of fisher misreporting may occur given the incentives created by a high deemed value rate and shortage of available ACE.

74. When kingfish was introduced to the QMS in 2003, the allowances for other sources of mortality caused by fishing varied between stocks. At this time, kingfish was not listed on Schedule 6 meaning that all commercially caught kingfish were required to be landed and balanced with ACE.[8] The ability of fishers to legally return live kingfish to the sea is likely to have affected the extent to which kingfish are subject to other sources of mortality caused by fishing by reducing the incentive to misreport and increasing the amount subject to post-release handling mortality.

[8] Kingfish were listed on schedule 6 of the Act in 2006.

75. As the allowance for all other sources of mortality to the stock caused by fishing has not been consistently applied in the past, and does not reflect changes to management settings, Fisheries New Zealand proposes to review the allowance for KIN 2, 3, 7 & 8. Fisheries New Zealand proposes to set the allowance for other sources of mortality to the stock caused by fishing at 10% of the TAC across all stocks.

76. The figure of 10% was chosen as this is the approximate mid-point of the current range of other sources of mortality caused by fishing across kingfish stocks. This approach is aligned with the approach taken in 2018 for other inshore stocks, with minor differences to reflect that kingfish is taken by both recreational fishers and a variety of commercial fishing methods.[9]

77. Fisheries New Zealand invites the views of tangata whenua and stakeholders regarding what level the allowance for other sources of mortality to the stock caused by fishing should be set at, and whether a standardised approach is appropriate, or a more stock-specific approach should be taken.

9. Review of KIN 2 (East Coast North Island)

9.1. Current management settings

78. The current TAC, TACC and allowances for KIN 2 are shown in Table 4.

Table 4: Current TAC, TACC and allowances for KIN 2. All figures in tonnes.

Stock	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
			Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 2	170	63	18	65	24

9.2. Recent catch levels and trends

9.2.1. **Māori customary** fishing

79. During 2019, customary catches of three ‘bins’ of kingfish were reported from KIN 2, this is the only recorded kingfish catch since 2012. Fisheries New Zealand is not able to provide an estimated weight of catch reported in bins, and recognises this information is incomplete and uncertain.

80. In addition, many iwi in the QMA operate under regulations 50/51 of the Fisheries (Amateur Fishing) Regulations 1986, for which reporting is not mandatory (see section 8.1).

81. However, given the increased availability of kingfish (as a result of the expected increase in abundance) and the increased customary take using commercial vessels, the customary harvest of KIN 2 may increase over future years.

82. Fisheries New Zealand welcomes feedback from tangata whenua in order to address this knowledge gap.

9.2.2. Recreational fishing

83. Between 2011/12 and 2017/18, the estimated recreational take of kingfish in KIN 2 increased from 41 t to 79 t, exceeding the recreational allowances by 14 t (Table 6).

[9] The other sources of mortality to the stock caused by fishing allowance for kingfish is proposed to be set at 10% of the TAC, rather than 10% of the TACC as per the approach taken in 2018. This is to reflect that kingfish are taken by both recreational fishers and a variety of commercial fishing methods, as opposed to predominantly trawl.

Table 5: Current recreational allowance, and 2011/12 and 2017/18 estimates of the recreational harvest in KIN 2.

Stock	Current recreational allowance (t)	Estimate of recreational harvest (t)	
		2011/12	2017/18
KIN 2	65	41	79

9.2.3. Commercial fishing

84. The majority of commercial KIN 2 catch is taken as bycatch by bottom trawl vessels targeting other species. There has been minor targeting since 2016-17, with two hand line events and one trawl event that reported kingfish targeting, the total estimated catch from these events was just 85 kg.

85. KIN 2 catches have increased during recent years with landings[10] exceeding the available ACE in three out of the last four years (Figure 4). Should this trend in increasing catches continue, commercial fishing activity may be constrained under the current catch settings.

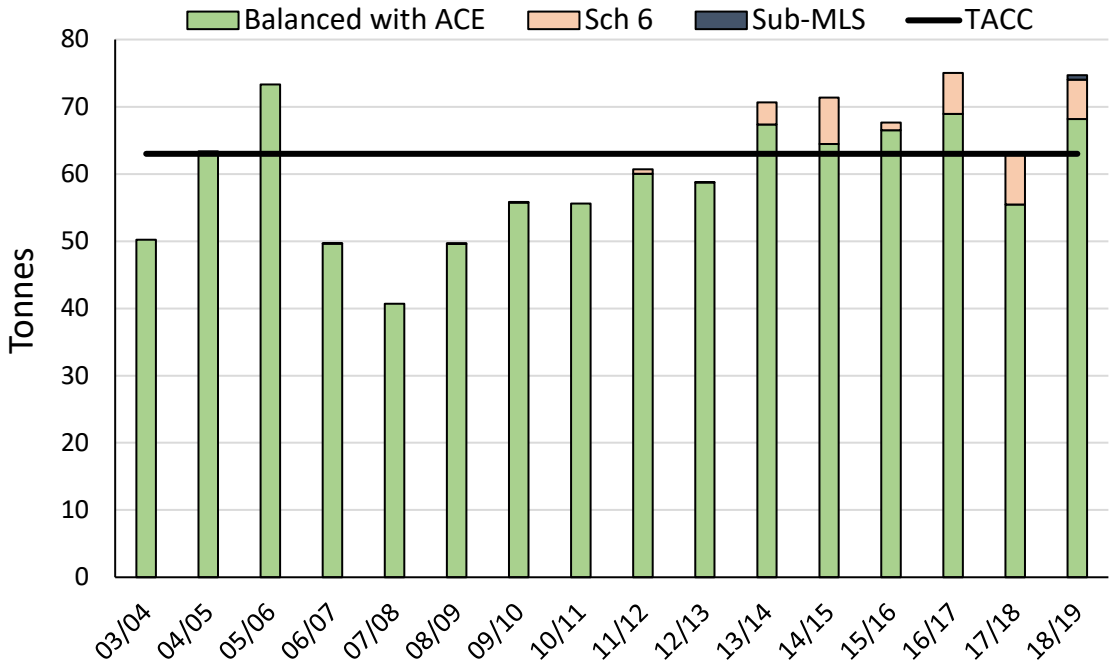

Figure 4: KIN 2 commercial catch since introduction to the QMS. Note that data on sub-MLS kingfish is only available post 2017/18.

9.3. Current state of KIN 2

86. Abundance of kingfish in the Bay of Plenty/KIN 2 population is assessed based on analysis of CPUE information from mixed-target bottom trawl fisheries, which was developed in 2019 and 2020. As the bottom trawl fisheries primarily catch juvenile kingfish, bottom trawl indices were considered to reflect relative abundance of juvenile kingfish.

87. The bottom trawl indices showed a moderately increasing CPUE from 2004 to 2016, before decreasing somewhat to 2019 (Figure 5). However, the bottom trawl indices are above average from 2013 to 2019, indicating good recruitment of kingfish.

[10] Landings include all fish balanced with ACE (e.g. includes fish consumed on board or returned to the sea under the authorisation of an observer), but excludes sub-MLS kingfish and fish returned to the sea under schedule six.

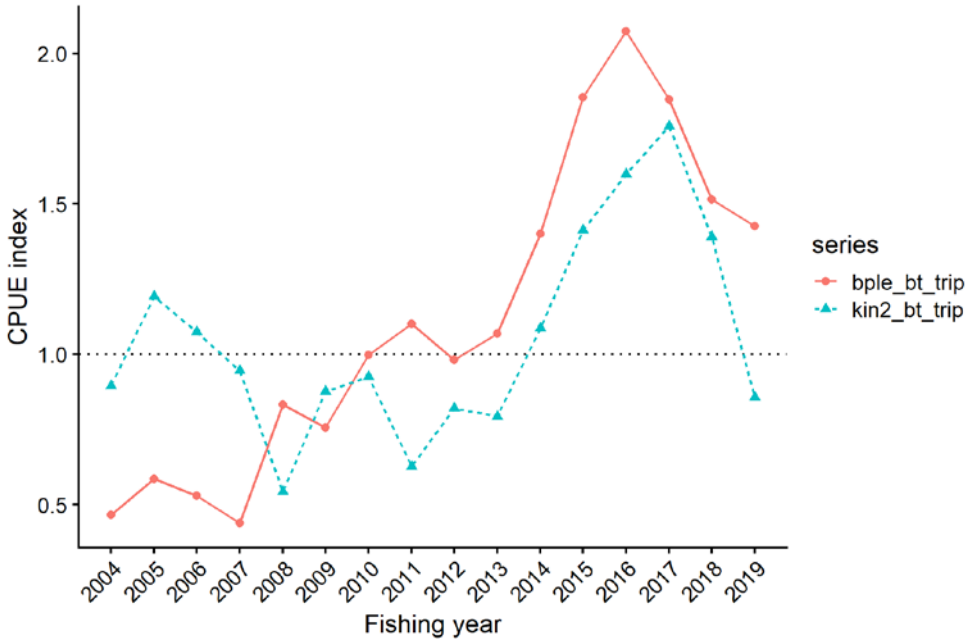

Figure 5: CPUE indices for juvenile kingfish in KIN 2 (blue) and the Bay of Plenty (red).

88. An additional supporting index was developed for the Bay of Plenty ramp survey data of catch information from recreational bait fishing trips. The bait fishing index shows significant inter-annual fluctuations, but has a generally increasing trend from 2001 to 2019.

89. As there is no accepted index of abundance for the adult population in this area, it is not possible to determine whether or not the Bay of Plenty/KIN 2 stock is at, above, or below the biomass that will support the maximum sustainable yield (B_{MSY}). The best available information on stock status comes from estimates of total fishing mortality in 2016 which was developed from catch at age sampling in 2010-11 and 2014-15.

90. The catch at age assessment indicated that total mortality was low, with fishing mortality was 'Likely' (>60%) to be below the default target, with overfishing 'Unlikely' (<40%) to be occurring.

91. The CPUE indices indicate there was a general increase in pre-recruit abundance from 2004 to 2016, when the fishing mortality for adults was estimated to be lower than the target. Although CPUE indices decreased somewhat from 2016 to 2019, they were above average from 2013-2019, and the stock is expected to increase in the short term. This suggests that the stock is relatively lightly exploited, and that an opportunity exists to increase harvest at this time.

9.4. Options – Varying TAC, TACC and allowances for KIN 2

92. To reflect the increased availability of kingfish to all sectors in KIN 2, Fisheries New Zealand proposes the following option for varying the TAC, TACC and allowances (Table 7). Feedback is sought on this option, or alternatives.

Table 6: Proposed TAC, TACC and allowances for KIN 2. All figures in tonnes, with percentage changes from current settings in brackets.

Stock	Option	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
				Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 2	Option 1	189 ↑ (11%)	70 ↑ (11%)	21 ↑ (17%)	79 ↑ (22%)	19 ↓ (21%)

9.5. Analysis of options for varying TAC, TACC and allowances for KIN 2

9.5.1. Option for varying TAC for KIN 2

93. A single option is proposed for increasing the TAC of KIN 2. The proposed option would increase the recreational allowance and TACC to reflect current catch levels, with the Customary Māori allocation also increased to provide for increased take due to increased availability.

94. As the option reflects current catches across the recreational and commercial sectors, the proposed option would not provide for any significant increases in harvest, reflecting that the information to assess the status of the KIN 2 stock is uncertain.

95. Best available information indicates that the total mortality is low both for the inshore and offshore regions, with fishing mortality below natural mortality and close to the default target. Given the current catch levels, use of Schedule 6, use of MLS, and practice of catch and release by recreational anglers, the stock is expected to increase in the short term. There is no information that indicates that an increase in the KIN 2 TAC as proposed would pose a risk to the sustainability of the stock.

9.5.2. Option for varying the allowances and TACC for KIN 2

Customary Māori allowance.

96. Given the increased availability of kingfish and use of commercial vessels for customary take, the customary harvest in KIN 2 may increase in coming years. To ensure future customary take is provided for, Fisheries New Zealand proposes to increase the customary Māori allowance from 18 tonnes to 21 tonnes (17% increase), which would retain the current proportional allocation to the customary Māori allowance of 11% of the TAC.

97. However, Fisheries New Zealand acknowledges that information regarding the customary take of kingfish in KIN 2 is not complete. Therefore, Fisheries New Zealand seeks information from tangata whenua during the consultation process regarding the level of customary take so as to inform final advice to the Minister.

Recreational allowance

98. The best estimate of KIN 2 recreational take is above the current recreational allowance. Given that best available information suggests increased abundance, with the stock expected to increase in the short term, Fisheries New Zealand proposes to increase the recreational allowance so as to provide for this increase in recreational catches.

99. The proposed option would increase the recreational allowance of KIN 2 from 65 tonnes to 79 tonnes (22% increase), and would increase the current proportional allocation of 38% of the TAC to 42% of the TAC.

Other sources of mortality to the stock caused by fishing

100. The current KIN 2 allocation for other sources of mortality to the stock caused by fishing has not changed since it was set in 2003, at 14% of the TAC.

101. Fisheries New Zealand proposes to decrease the allowance for other sources of mortality to the stock caused by fishing from 14% to 10% of the TAC. This is in line with the proposals for other kingfish stocks under review, and enables a consistent approach for setting the proportional allocation of other sources of mortality to the stock caused by fishing.

Total Allowable Commercial Catch

102. Commercial fishers continue to land kingfish in KIN 2 despite relatively high deemed values and their ability to return live kingfish to the sea. This suggests increasing levels of KIN 2 as unavoidable bycatch.

103. The best available information indicates that the probability of current catch, or TACC causing overfishing to continue or commence is '*Unlikely'* (<40%), and the stock is expected to increase in the short term. The current TACC does not reflect the information suggesting there has been an increase in the abundance of kingfish in KIN 2, and is likely constraining utilisation of other target species, and imposing unnecessary costs on the commercial sector.

104. To reflect this, Fisheries New Zealand is proposing an increase to the TACC of KIN 2 from 63 tonnes to 70 tonnes (11%), retaining the current proportional allocation of 37% of the TAC. Based on catch levels during the 2018/19 and 2019/20 fishing years, the proposed option is likely to provide sufficient ACE for commercial fishers to cover all current kingfish landings.

105. The additional ACE made available through this option is expected to be used to balance kingfish taken as bycatch. The extremely small amount of kingfish reported as targeted indicates that the proposed increase to the TACC is very unlikely to result in the initiation of a kingfish target fishery. As long as the kingfish fishery remains a bycatch fishery, there is no information that would suggest associated target species will be adversely affected by the proposal.

106. This option would provide economic benefits through the effect of reducing deemed value invoices incurred by fishers. Based on landings over the last five fishing years, the proposed option would reduce deemed value invoices by approximately $18,000 per annum (100% i.e. no deemed values would be invoiced for KIN 2). However, these calculations are uncertain and dependent upon an individual operator's ACE holdings and level of over-catch.

9.6. Uncertainties and risks

107. Whilst information suggests that kingfish in the Bay of Plenty (KIN 1) and East Cape (KIN 2) may comprise a single biological population, linkages between kingfish in this area, and those elsewhere in KIN 2 is unknown. Therefore, the structure of the KIN 2 stock is uncertain.

108. It remains unknown whether or not the KIN 2 stock is at, above, or below the biomass that will support the maximum sustainable yield (B_{MSY}), however best available information indicates total mortality is low for the northern part of the stock, with fishing mortality below the target, and high average recruitment of young kingfish since 2013.

109. There is no information to indicate that the current catch level of kingfish in KIN 2 or the proposed modest increase in the TAC would pose a risk to the sustainability of the stock or adversely affect associated target species.

110. Fisheries New Zealand will continue to monitor the state of the fishery via total landings. In addition, an updated CPUE for KIN 2 is scheduled for 2021, which will provide greater certainty about abundance trends and further opportunity to review the fishery in 2022.

10. KIN 3 (South East Coast, Southland & Sub-Antarctic)

10.1. Current management settings

111. The current TAC, TACC and allowances for KIN 3 are shown in Table 8.

Table 7: Current TAC, TACC and allowances for KIN 3. All figures in tonnes.

Stock	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
			Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 3	17	6	4	6	1

10.2. Recent catch levels and trends

10.2.1. **Māori customary fishing**

112. Māori customary catch reporting data held by Fisheries New Zealand shows no records of kingfish catch in KIN 3. This reporting is likely to be largely complete with the KIN 3 QMA under the Fisheries (South Island Customary Fishing) Regulations, which carry a requirement to report.

113. However, with increasing kingfish abundance in KIN 3, it is likely that customary catches of kingfish could begin. Fisheries New Zealand considers the current customary allowance appropriate to cover this take, however information is sought from tangata whenua so as to inform final advice to the Minister.

10.2.2. Recreational fishing

114. Between 2011/12 and 2017/18, the estimated recreational take of kingfish in KIN 3 increased from 3 t to 6 t (Table 10).

Table 8: Current recreational allowance, and 2011/12 and 2017/18 estimates of the recreational harvest of kingfish in KIN 3.

Stock	Current recreational allowance (t)	Estimate of recreational harvest (t)	
		2011/12	2017/18
KIN 3	6	3	6

10.2.3. Commercial fishing

115. The majority of commercial KIN 3 catch is taken as bycatch by the coastal set net fleet targeting shark species. Kingfish caught in set nets are unable to be returned to the sea under Schedule 6. Therefore, all kingfish caught by set net vessels are required to be landed despite observers reporting many fish to be alive when brought on board. During 2019/20, smaller quantities of kingfish in KIN 3 were also taken by the large trawl vessels targeting squid off the Otago coast.

116. KIN 3 commercial catch has increased, by progressively increasing margins, over the last decade (Figure 6). Fishing effort by the coastal set net fleet has decreased over this time period and there is no evidence to suggest a noticeable change in areas fished or operational practices that may have increased the amount of kingfish taken as bycatch.

117. Catches regularly exceed the available ACE resulting in deemed value invoices averaging $42,000 over the last three fishing years. Despite the increase to the TACC from 1 October 2018, catch exceeded the available ACE for the 2018/19 fishing year. As of April 2020, available KIN 3 ACE was 110% caught.

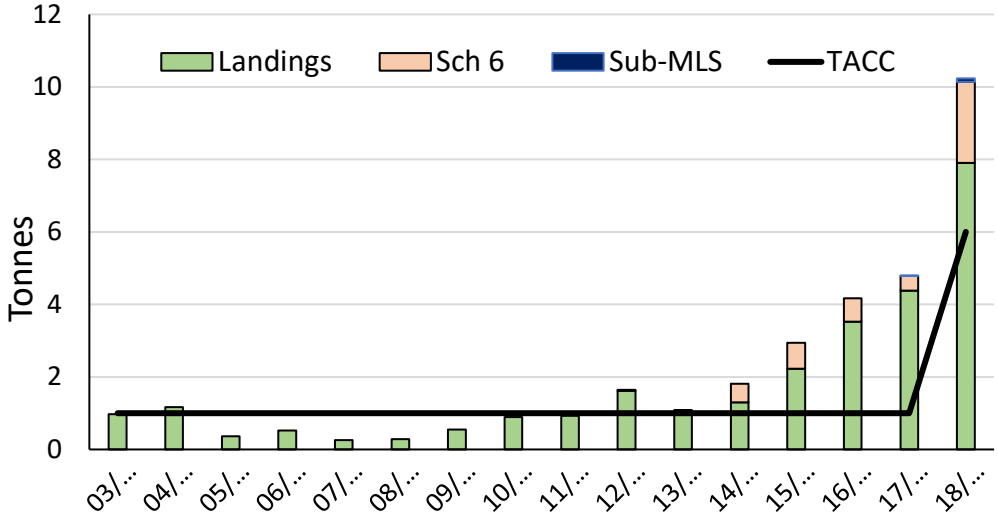

Figure 6: KIN 3 commercial catches since introduction to the QMS. Note that data on sub-MLS kingfish is only available post 2017/18.

10.3. Current state of KIN 3

118. Catch data alone is used to monitor the stock and the best available information comes from commercial landing records.

119. As kingfish are principally taken as bycatch by commercial fishers, and catches have been small until recently, there are no accepted reference points to determine the status of KIN 3 in relation to targets, and a level of stock biomass that can support harvest of the maximum sustainable yield (B_{MSY}) is not known.

120. Best available information suggests that there has been an increase in the abundance of kingfish in KIN 3, which appears to be the result of increased population size in northern regions (KIN 7 & 8) and increasing water temperature encouraging range expansion.

121. It is likely that the observed increase in abundance will continue to be reflected in an increase in kingfish bycatch by commercial fishers. As the majority of KIN 3 is taken using the method of set netting, many fishers will be unable to manage this increase in abundance through the use of Sixth schedule provisions.

122. In addition, this increase in abundance will likely provide for an increase in available kingfish for non-commercial fishers to catch.

10.4. Options – Varying TAC, TACC and allowances for KIN 3

123. To reflect the increased abundance in KIN 3, Fisheries New Zealand proposes the following options for varying the TAC, TACC and allowances (Table 11).

Table 9: Proposed TAC, TACC and allowances for KIN 3. All figures in tonnes, with percentage changes from the current settings in brackets.

Stock	Option	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
				Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 3	Option 1	21 ↑ (24%)	9 ↑ (50%)	4	6	2 ↑ (100%)
	Option 2	23 ↑ (35%)	11 ↑ (83%)	4	6	2 ↑ (100%)

10.5. Analysis of options for varying TAC, TACC and allowances for KIN 3

10.5.1. Options for varying TAC for KIN 3

124. To reflect the increased abundance of KIN 3, Fisheries New Zealand proposes two options for varying the TAC. Both options propose an increase to the TAC, and include increases in TACC and allowance for all other sources of fishing related mortality, while keeping the recreational and customary Māori allowances at the current level.

125. Option 1 is set to reflect current catches for all sectors, based on catch reporting and anecdotal accounts of an increased abundance in KIN 3. This option proposes that the TAC is increased from 17 tonnes to 21 tonnes (24% increase) and takes a cautious approach by not providing for a significant increase in current catch levels. Option 1 reflects that information to assess the status of KIN 3 is uncertain.

126. Option 2 is set to provide for increased utilisation in future years. This option proposes that the KIN 3 TAC be increased to 23 tonnes (35% increase). This option places greater weight on information showing increasing abundance of kingfish in KIN 3, providing for anticipated unavoidable bycatch in the commercial sector.

127. There is no information to indicate that the current catch level of kingfish in KIN 3, or an increase in the KIN 3 TAC would pose a risk to the sustainability of the stock. However, Option 2 is likely to present a greater potential for risk. Under both options, Fisheries New Zealand will

continue to monitor the state of the KIN 3 fishery via total landings for the fishery, and may consider reviewing the TAC when this information is updated.

10.5.2. Options for varying the allowances and TACC for KIN 3

Customary Māori allowance

128. It is proposed that the Customary Māori allowance for KIN 3 remains unchanged, as the current level adequately provides for utilisation at this time. Under Option 1 and Option 2, the current proportional allocation for Customary Māori allowance would decrease from 24%, to 19% and 17%, respectively.

129. With increasing kingfish abundance in KIN 3, it is likely that customary catches of kingfish could increase. Fisheries New Zealand considers the current customary allowance appropriate to cover this take; however information is sought from tangata whenua so as to inform final advice to the Minister.

Recreational allowance

130. It is proposed that the current KIN 3 recreational allowance of 6 tonne be retained. This corresponds with the National Panel Survey estimate of 6 tonnes in 2017-18, reflecting best available information on recreational catch. Under Option 1 and Option 2, the current proportional allocation for the recreational allowance would decrease from 35%, to 29% and 26%, respectively.

Other sources of mortality to the stock caused by fishing

131. As with other kingfish stocks, the extent of other sources of mortality caused by fishing is unknown. The current proportional allocation was set at a nominal level in 2018 at 6% of the TAC.

132. Given proposals to increase the TAC and the TACC, both Option 1 and Option 2 propose to increase the allowance for other sources of mortality to the stock caused by fishing from 1 tonne to 2 tonnes (100% increase). This would set the allowance for other sources of mortality to the stock caused by fishing at a fixed level at, or close to, 10% of the TAC. This is in line with proposals for other kingfish stocks under review, and enables a consistent approach for setting the allowance for other sources of mortality to the stock caused by fishing.

Total Allowable Commercial Catch

133. Catch effort reporting by commercial fishers and anecdotal accounts from all fishing sectors indicates that kingfish are being observed more frequently in southern regions in recent years, especially over the summer months when inshore waters are warmer.

134. Increased abundance of kingfish elsewhere and the increases in average sea surface temperature in southern regions observed in recent years, indicate that KIN 3 abundance has also increased.

135. Commercial fishers continue to land kingfish in KIN 3 despite relatively high deemed values, and the ability of some fishers to return live kingfish to the sea. This suggests increasing levels of KIN 3 as unavoidable bycatch and that the TACC could be constraining utilisation of associated target species and imposing unnecessary costs on the commercial sector.

136. Option 1 is set to reflect current commercial catches in KIN 3, with increases reflecting what is already being caught in some years, and does not provide for significant increased harvest by commercial fishers. Under this Option the TACC is proposed to increase from 6 tonnes to 9 tonnes (50% increase). This option is likely to indicate a cautious approach to increasing the TACC and while recognising that the information to assess the status of the KIN 3 stock is uncertain.

137. Option 1 is anticipated to provide sufficient ACE for commercial fishers to cover all kingfish landings, based on catch levels during 2018/19. However, there is a possibility that this option may be insufficient in responding appropriately to the inevitable bycatch of kingfish in associated target commercial fisheries. This is evidenced by increasing bycatch in the midwater trawl target squid fishery, in the incomplete 2019/20 fishing year which has resulted in available

ACE being 110% caught by April 2020. If this is an indicator of future trends in the fishery, this option may not fully resolve potential waste and socio-economic impacts in this fishery.

138. Option 2 is set to provide for utilisation of kingfish in future years by providing the right incentives for commercial fishers to land all kingfish of legal size that cannot be returned to the water under Schedule 6 of the Act, with the KIN 3 TACC increased from 6 to 11 tonnes (83% increase). This option places greater weight on anecdotal and catch information showing increasing abundance in KIN 3, providing for anticipated bycatch in the commercial sector based on preliminary information from the current fishing year.

139. Given current levels of over-catch, both options would provide economic benefits through the effect of reducing deemed value invoices incurred by fishers. Based on landings during the last five fishing years, both options would reduce deemed value invoices by approximately $31,000 per annum (100%). However, these calculations are uncertain and dependent upon an individual operator's ACE holdings and level of over-catch. By providing additional ACE, Option 2 would have the effect of reducing deemed value invoices during future years if the catches continue to increase.

10.6. Uncertainties and risks

140. In the case of KIN 3, there is no information to determine the status of the stock in relation to targets, and a level of stock biomass that can support harvest of the maximum sustainable yield (B_{MSY}) is not known. Best available information to inform TAC setting for KIN 3 at this time is the increase in commercial catch and anecdotal information from all sectors that abundance is increasing.

141. Under the Act there is a requirement to act on the best available information and not postpone or fail to set a TAC due to the absence of, or uncertainty in, information. Best available information suggests that the current TAC is likely unnecessarily constraining utilisation; including that of other target species, and imposing unnecessary costs on the commercial sector.

142. Fisheries New Zealand will continue to monitor the state of the fisheries via total landings, and may consider reviewing the TAC when this information is updated.

11. Review of KIN 7 & 8 (West Coast)

11.1. Current management settings

143. The current TAC, TACC and allowances for KIN 7 & 8 are shown in Table 12.

Table 10: Current TAC, TACC and allowances for KIN 7 & 8. All figures in tonnes.

Stock	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
			Customary **Māori**	Recreational	Other sources of mortality to the stock caused by fishing
KIN 7	41	15	2	20	4
KIN 8	92	45	9	31	7

11.2. Recent catch level and trends

11.2.1. **Māori customary fishing**

144. There has been no recorded approvals or catches of kingfish in KIN 7 during recent years. However, tangata whenua north of Kahurangi Point, and in the Marlborough Sounds and Tasman/Golden bays area are still operating under regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013, which do not require customary permits or catches to be reported.

145. Available data on the level of the customary take of kingfish in KIN 8 shows variation in catches between years. During 2019, customary catches of 11,950 kg of kingfish and 450 individual kingfish were reported from KIN 8. Using an estimated average weight of 10 kg per fish, the estimated customary take in KIN 8 during 2019 was approximately 16,450 kg. This was the highest annual reported volume of customary take on record in KIN 8 and exceeded the current customary allowance (9 t).

146. The majority of the customary harvest of kingfish in KIN 8 in recent years has been taken using commercial vessels. A similar mechanism may be utilised in KIN 7 in the near future, and customary harvest of kingfish in KIN 7 may increase over the next few years.

147. To inform final advice to the Minister on the setting of a customary allowance, Fisheries New Zealand seeks information from tangata whenua regarding the customary take of kingfish in KIN 7 & 8.

11.2.2. Recreational fishing

148. Between 2011/12 and 2017/18, the estimated recreational take of KIN 7 increased from 21 t to 27 t, and that of KIN 8 decreased from 63 t to 55 t. For both stocks this has resulted in recreational take in 2017-18 exceeding the current recreational allowance (Table 14).

Table 11: Current recreational allowance, and 2011/12 and 2017/18 estimates of the recreational harvest of kingfish for KIN 7 and KIN 8.

Stock	Current recreational allowance (t)	Estimate of recreational harvest (t)	
		2011/12	2017/18
KIN 7	20	21	27
KIN 8	31	63	55

11.2.3. Commercial fishing

149. The majority of commercially caught kingfish in KIN 7, and approximately 40% of the kingfish in KIN 8 are taken by large (>80 m) midwater trawl vessels targeting pelagic species, principally jack mackerel.

150. The pelagic midwater trawl fishery is a large volume fishery. Kingfish typically comprises a very small proportion of the total catch,[11] however due to the schooling behaviour of the species, kingfish catches can sporadically occur in large quantities.[12] Kingfish catches by the midwater trawl fleet occur during all months, and in all areas where fishing takes place.

151. Approximately 50% of kingfish taken by the midwater trawl fleet are returned to the sea alive under Schedule 6.[13] This fleet has very high levels of observer coverage (approximately 80% per annum since 2012), with observers consistently commenting that the crew make every effort to return live fish to the sea following hauling.

152. Fishing effort by the midwater trawl fleet off the West Coast has decreased over the previous 10 years. However, the decrease in fishing effort has been offset by an increase in the duration of each fishing event. Given commercial fishing restrictions relating to the size of vessels, the midwater trawl fleet are unable to fish within 12 nm of the coast (or 25 nm off the West Coast of the South Island).

153. All kingfish caught by the midwater trawl fleet that are unable to be returned to the sea are processed into a frozen head and gutted state. This product has a relatively low landed value when compared to fish landed fresh and green (whole).

154. The remaining catch in KIN 8 is taken by inshore trawl vessels, especially those targeting trevally off the Northland coast, or set net vessels active off the coast of Taranaki. Kingfish retained by inshore trawl or set net vessels are stored on ice until the vessel returns to shore.

[11] Analysis of observer data between the 2015/16 and 2018/19 fishing year indicates that kingfish comprises approximately 0.3% of the total catch of midwater trawl vessels targeting jack mackerel off the West Coast of both islands.

[12] Between 2016/17 and 2018/19, 28% of the observed KIN 7 & 8 catch by the midwater fleet occurred during twenty fishing events (approximately 0.05% of the observed effort by the midwater trawl fleet in the areas encompassed by KIN 7 & 8)

[13] Based on fisher reported data between the 2016/17 and 2018/19 fishing years.

Therefore, fish landed by such vessels are of a higher value than those landed by midwater trawl vessels.

155. Commercial catches of KIN 7 have exceeded the available ACE, by progressively increasing margins, over the last decade (Figure 7). Such over-catch has resulted in considerable deemed value invoices, totalling $536,000 and $798,000 for the 2017/18 and 2018/19 fishing years respectively.

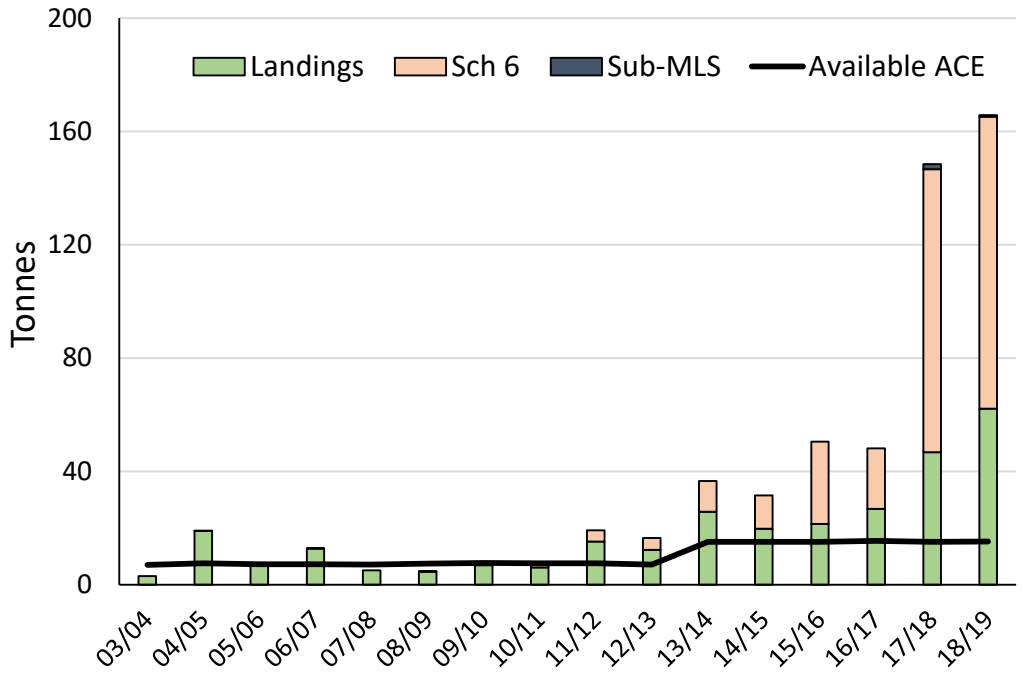

Figure 7: KIN 7 commercial catches since introduction to the QMS.
Note that data on sub-MLS kingfish is only available post 2017/18.

156. The landed catch of kingfish in KIN 8 has exceeded the available ACE each year since introduction to the QMS (Figure 8). Such over-catch has resulted in deemed value invoices averaging $279,000 over the previous five years. As of March 2020, available KIN 8 ACE for the 2019-20 fishing year was 192% caught.

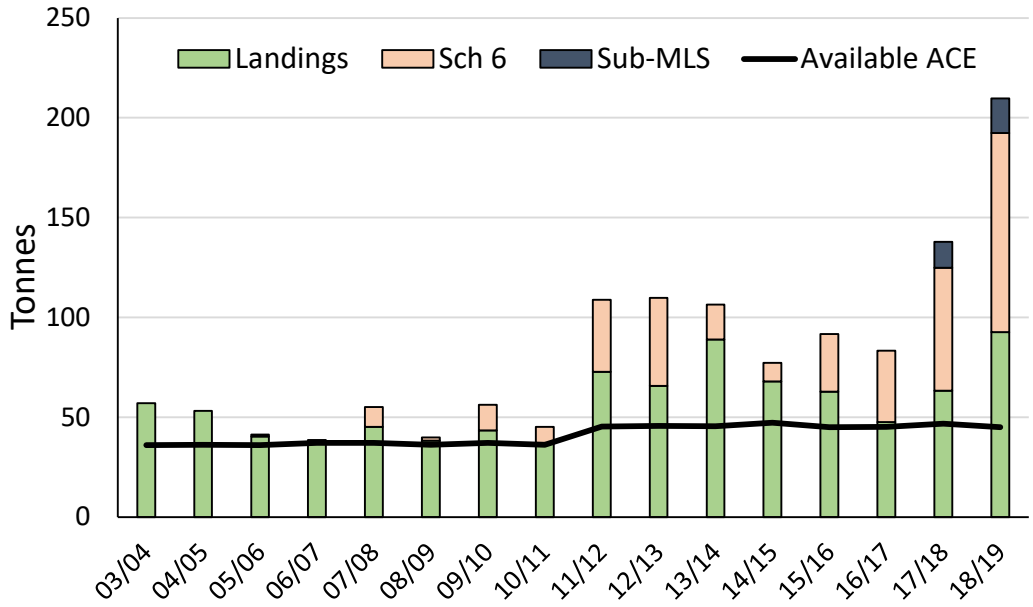

Figure 8: KIN 8 commercial catches since introduction to the QMS. Note that data on sub-MLS kingfish is only available post 2017/18.

11.3. Current state of KIN 7 & 8

157. During 2019 and 2020, a standardised CPUE index for KIN 7 & 8 was developed using observer recorded tow-by-tow data on kingfish catches by the midwater trawl fleet targeting jack mackerel.[14] A standardised CPUE index for KIN 8 was also developed using commercially reported catch effort and landing data from the mixed-target inshore bottom trawl fishery north of Cape Egmont.[15] The information used to inform the CPUE was considered by the Working Group to be of a High Quality.

158. The midwater trawl fleet captures a wide size range of kingfish and is considered to index the entire kingfish population (Figure 9). As the bottom trawl fishery captures mainly juvenile fish, the Working Group concluded that the bottom trawl index was best regarded as an index of juvenile fish only. Therefore, the Working Group concluded that the midwater trawl index provided the best available index of kingfish in KIN 7 & 8, with the bottom trawl index used as supporting index to assist with the interpretation of future trends.

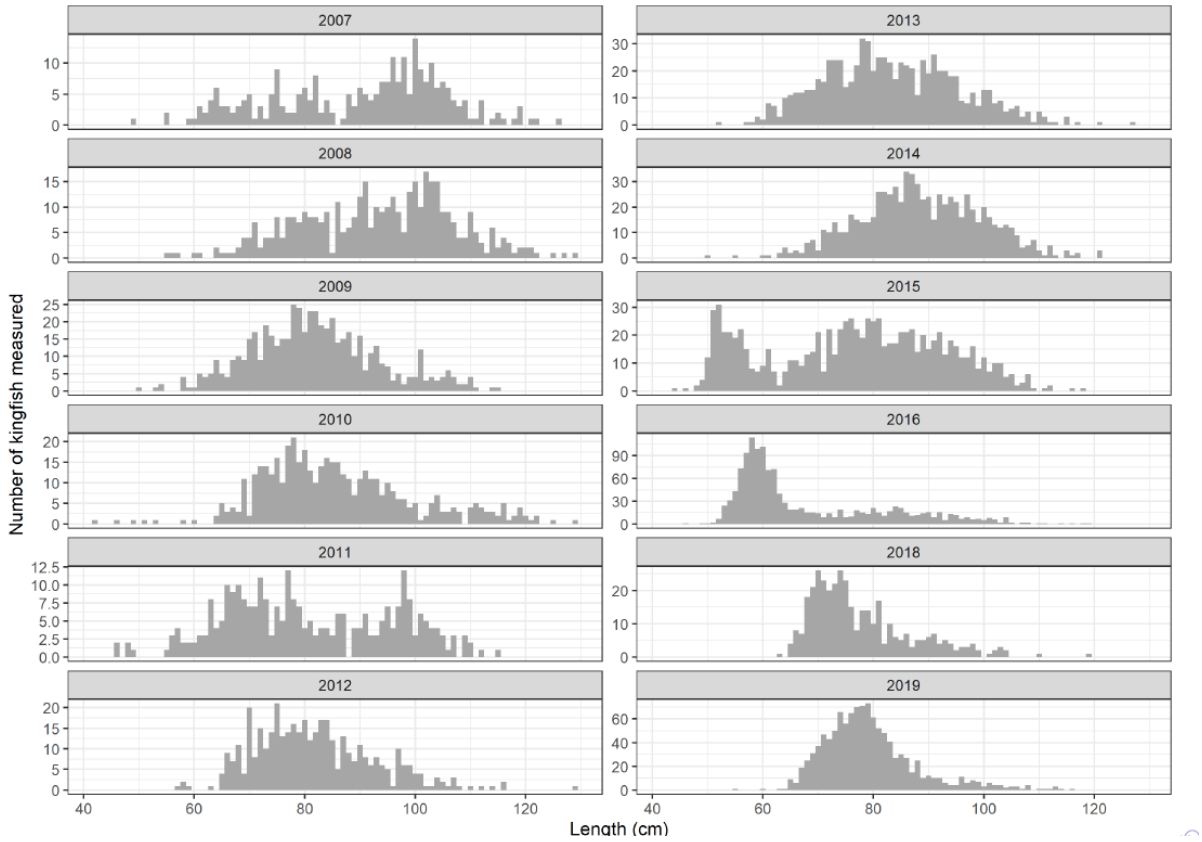

Figure 9: Kingfish length frequency information recorded by observers for kingfish in KIN 7 & 8 taken by the large pelagic midwater trawl fleet. The year 2007 refers to the 2006/07 fishing year.

159. The observer tow-by-tow index showed a considerable increase in the CPUE between 2006/07 and 2016/17, after which the index remained stable. This trend was apparent in all areas where the midwater trawl fleet was active (i.e. the increase in the index was not driven by an increase in kingfish catch rates in KIN 7 only, rather catch rates increased in all areas regardless of latitude).

160. The Working Group considered that an increase in the abundance of KIN 7 & 8 was the only biologically plausible explanation for the rise in CPUE. Evidence from the size composition data from the midwater trawl fleet suggested that strong recruitment, first observed as sub-MLS fish in 2015 (Figure 9), is responsible for the increase in population biomass.

[14] A second standardised CPUE index was also developed for kingfish catches by the midwater trawl fleet using commercially reported data from trips where an observer was placed on board, with data aggregated to the trip level (rather than individual fishing events). However, as both indices showed very similar trends, the observer CPUE index was chosen as the abundance index as the use of tow by-tow data was considered to be more informative than trip level data.

[15] Statistical areas 041, 042, 045, 046 & 047.

161. Using the mean CPUE between 2004/05 and 2009/10 as the soft limit, the abundance of KIN 7 & 8 was estimated to be '*Very Likely*' (>90%) above the default target (Figure 10).

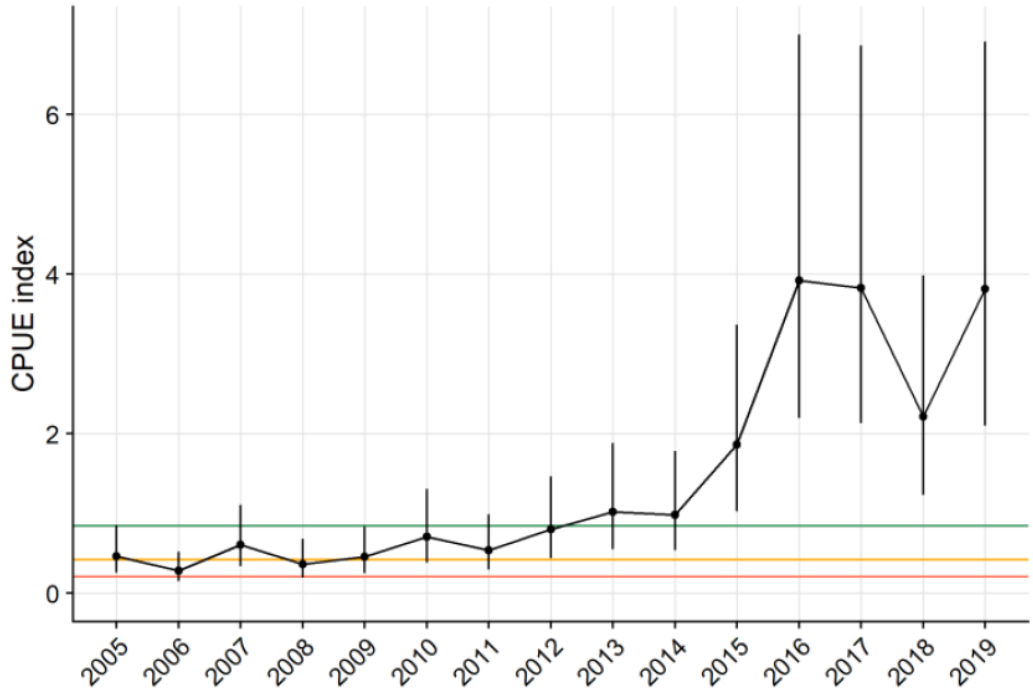

Figure 10: Standardised CPUE index for kingfish (KIN 7 & 8) catches by the midwater trawl fleet targeting jack mackerel between the 2004/05 and 2018/19 fishing years. The solid green horizontal line represents the default target, the orange line the soft limit and the red line the hard limit. Error bars represent 95% confidence intervals.

162. The bottom trawl index of juvenile kingfish fluctuated without trend between 2004/05 and 2014/15 before a particularly strong increase from 2017/18 (Figure 11).

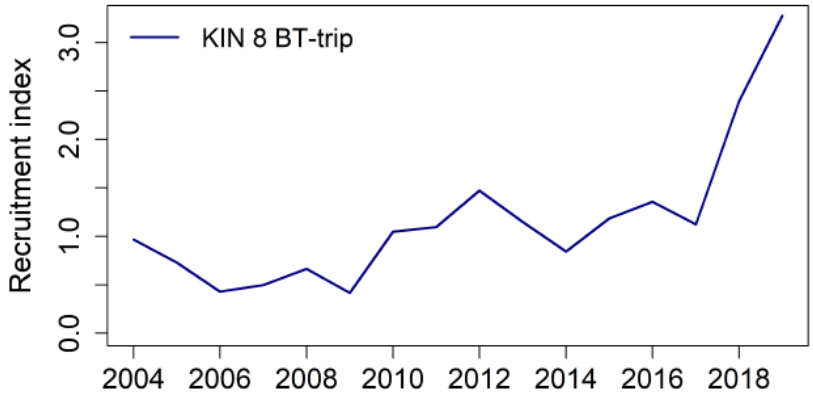

Figure 11: CPUE index of juvenile kingfish in KIN 8 between the 2004/04 and 2018/19 fishing years.

11.4. Projections of biomass

163. The Working Group considered that current catch levels were '*Very Unlikely*' (<10%) to result in the biomass of KIN 7 & 8 declining below the soft limit during the short term.

164. As the juvenile index showed a substantial increase in the last two years, the Working Group anticipated that the biomass of KIN 7 & 8 will continue to increase at current catch levels.

11.5. Options – Varying TAC, TACCs and allowances for KIN 7 & 8

165. Options for varying the TAC, TACC and allowances are shown in Table 15.

Table 12: Proposed TACs, TACCs and allowances for KIN 7 & 8. All figures in tonnes, with percentage changes from current settings in brackets.

Stock	Option	Total Allowable Catch	Total Allowable Commercial Catch	Allowances		
				Customary **Māori**	Recreational	All other mortality to the stock caused by fishing
KIN 7	Option 1	82 ↑ (100%)	30 ↑ (100%)	4 ↑ (100%)	40 ↑ (100%)	8 ↑ (100%)
	Option 2	122 ↑ (198%)	44 ↑ (193%)	6 ↑ (200%)	60 ↑ (200%)	12 ↑ (200%)
KIN 8	Option 1	167 ↑ (77%)	80 ↑ (77%)	17 ↑ (89%)	55 ↑ (77%)	16 ↑ (129%)

11.6. Analysis of options for varying TAC, TACCs and allowances for KIN 7

11.6.1. Options for varying TAC for KIN 7

Total Allowable Catch

166. The best available information estimates that the biomass of KIN 7 has increased considerably since the TAC was last reviewed, with biomass anticipated to increase at current catch levels. Therefore, Fisheries New Zealand considers that increasing the TAC of KIN 7 to reflect the increase in availability of kingfish will not impact upon the sustainability of the stock, and is consistent with managing KIN 7 to support healthy recreational fisheries.

167. Two options are proposed for increasing the TAC of KIN 7

168. To reflect the increase in kingfish availability across all sectors, Option 1 would increase the TAC, the TACC and the Customary Māori, recreational and all other sources of fishing related mortality allowances by 100%. This approach is similar to that used when the TAC of KIN 7 was last reviewed in 2013.

169. Option 2 would use a similar approach to determining the TAC as that used when kingfish was introduced to the QMS in 2003. The TACC would be set at 44 tonnes which reflects average commercial landings over the most recent two years, minus 20%. The allowances for Customary Māori fishers, recreational fishers and all other sources of fishing related mortality allowances would then be increased appropriately so as to retain the current proportional allocation of the TAC.

170. Fisheries New Zealand does not expect that catches of kingfish by commercial or non-commercial fishers will increase above existing levels as a consequence of either proposed option alone (see below for an analysis of the impact the proposed options on commercial catches). Therefore, as the biomass of kingfish is anticipated to increase under current catches, both option are considered unlikely to impact upon the sustainability of the stock.

11.6.2. Options for varying the allowances and TACC for KIN 7

Customary Māori allowance

171. The increased abundance of KIN 7 has likely increased the availability of the species to customary non-commercial fishers. Therefore, Fisheries New Zealand proposes to increase the customary Māori allowance of KIN 7 under both options to reflect the likely increase in take.

172. Under Option 1, the customary Māori allowance would increase from 2 tonnes to 4 tonnes (100% increase), whilst under Option 2 the customary Māori allowance would increase from 2 tonnes to 6 tonnes (200% increase). Both options would retain the current proportional allocation of 5% of the KIN 7 TAC as an allowance for customary fishers.

173. Fisheries New Zealand acknowledges that information on the customary harvest of kingfish in KIN 7 is incomplete and may increase over coming years due to the increased exercise of

customary permits on commercial vessels. Fisheries New Zealand seeks information from tangata whenua during the consultation process so as to inform final advice to the Minister.

Recreational allowance

174. The current best estimate of KIN 7 recreational take is above the current recreational allowance. Given that the abundance of KIN 7 is estimated to have increased considerably over recent years, under both options Fisheries New Zealand proposes to increase the recreational allowance so as to provide for the increase in recreational catches.

175. Under Option 1, the recreational allowance would increase from 20 tonnes to 40 tonnes (100% increase), whilst under Option 2 it would increase from 20 tonnes to 60 tonnes (200% increase).

176. Both proposed options would set the recreational allowance of KIN 7 above the most recent National Panel Survey estimate (27 tonnes for 2017/18). Given that information on recreational fishing activity is uncertain and only available at 5-6 year intervals,[16] such an approach may be appropriate so as to;

- Account for the continuation of the increasing trend in recreational kingfish catches since 2017/18; and
- Ensure the TAC provides for future recreational catches given that the biomass of the stock is anticipated to continue to grow and/or recreational fishing intensity targeting kingfish increases due to the greater availability of fish.

177. Both options would retain the current proportional allocation of approximately 49% of the KIN 7 TAC as an allowance for recreational fishers.

Other sources of mortality to the stock caused by fishing

178. Both options to increase the KIN 7 TAC would increase the allowance for other sources of mortality to the stock caused by fishing. Under Option 1, this allowance would increase from 2 tonnes to 4 tonnes (100% increase), whilst under Option 2 the allowance for other sources of mortality to the stock caused by fishing would increase from 2 tonnes to 6 tonnes (200% increase).

179. Both options would retain the current proportional allocation of 10% of the KIN 7 TAC as an allowance for other sources of mortality to the stock caused by fishing. This is consistent with what is proposed for other kingfish stocks.

Total Allowable Commercial Catch

180. To reflect the increased amounts of kingfish taken as bycatch by commercial fishers, both options to increase the TAC would increase the TACC of KIN 7. Both options would retain the current proportional allocation between the TACC and other allowances (with the TACC set at 36% of the TAC)

181. Under Option 1, the TACC would increase from 15 tonnes to 30 tonnes (100% increase), whilst under Option 2 the TACC would increase from 15 tonnes to 44 tonnes (193% increase).

182. Due to the levels of over-catch in this stock during recent years, both options are unlikely to provide sufficient ACE to cover all commercial landings. Fisheries New Zealand expects that all the additional ACE made available through either option will be used to balance against kingfish taken as bycatch. Therefore, both Option 1 and Option 2 are considered very unlikely to result in the initiation of a target fishery for KIN 7.

183. Given current levels of over-catch, both options provide economic benefits through the effect of reducing deemed value invoices incurred by fishers. Based on the most recent complete fishing year, deemed value invoices would be reduced by approximately $400,000 (50%) under Option 1 and $600,000 (75%) under Option 2. However, these calculations are uncertain and dependent upon an individual operator's ACE holdings and level of over-catch.

[16] The next National Panel Survey of recreational fishers is planned for the 2021/22 fishing year.

11.7. Analysis of option for varying TAC, TACC and allowances for KIN 8

11.7.1. Option for varying TAC for KIN 8

Total Allowable Catch

184. The best available information estimates that the biomass of KIN 8 has increased considerably since the TAC was last reviewed, with biomass anticipated to increase at current catch levels. Therefore, Fisheries New Zealand considers that increasing the TAC of KIN 8 to reflect the increase in availability of kingfish will not impact upon the sustainability of the stock, and is consistent with managing KIN 8 to support healthy recreational fisheries.

185. A single option is proposed for increasing the TAC of KIN 8. This option would increase the TAC from 92 tonnes to 167 tonnes (77% increase).

186. Fisheries New Zealand does not expect that catches of kingfish by commercial or non-commercial fishers will increase above current levels as a consequence of the proposed option alone (see below for an analysis of the impact the proposed options on commercial catches). Therefore, as the biomass of kingfish is anticipated to increase under current catches, the proposed option is considered unlikely to impact upon the sustainability of the stock.

11.7.2. Option for varying the allowances and TACC for KIN 8

Customary Māori allowance

187. The proposed option would increase the allowance for customary Māori fishers from 9 tonnes to 17 tonnes (89% increase) so that it is set at the best available estimate of the level of customary take. The proposed option would retain the current proportional allocation of 10% of the KIN 8 TAC as an allowance for customary fishers.

188. Fisheries New Zealand acknowledges information on the customary harvest of kingfish in KIN 8 is incomplete and may increase over future years through the increased exercise of customary permits on commercial vessels. Information from tangata whenua during the consultation process is sought so as to inform final advice to the Minister.

Recreational allowance

189. The proposed option would increase the recreational allowance of KIN 8 from 31 tonnes to 55 tonnes (77% increase). This would set the recreational allowance at the best available estimate of the level of recreational take (2017-18 National Panel Survey estimate) and would retain the current proportional allocation of 34% of the KIN 8 TAC as an allowance for recreational fishers.

190. Fisheries New Zealand acknowledges that the approach for setting the recreational allowance of kingfish differs between KIN 7 and KIN 8. However, Fisheries New Zealand considers the approach taken for KIN 8 appropriate for this stock given the:

- Estimated decline in recreational catches of kingfish in KIN 8 between 2011/12 and 2017/18; and
- KIN 8 is a northerly stock, therefore future recreational kingfish catches may increase less in this management area, when compared to more southerly stocks.

Other sources of mortality to the stock caused by fishing

191. The proposed option would increase the allowance for other sources of mortality to the stock caused by fishing from 7 tonnes to 16 tonnes (129%). The proposed option would set this allowance at 10% of the TAC, consistent with the approach taken for other kingfish stocks.

Total Allowable Commercial Catch

192. To reflect the increased amounts of kingfish taken as bycatch by commercial fishers, the proposed option would increase the TACC of KIN 8 from 45 tonnes to 80 tonnes (77%). The proposed option would retain the current proportional allocation between the TACC and other allowances (with the TACC set at 48% of the TAC).

193. Based on catch levels during the 2018/19 and 2019/20 fishing years, the proposed option is unlikely to provide sufficient ACE for commercial fishers to cover all kingfish landings. Fisheries New Zealand expects that all the additional ACE made available through this option will be used to balance against kingfish taken as bycatch. Therefore, Fisheries New Zealand consider that the proposed option is very unlikely to result in the initiation of a target fishery for KIN 8.

194. Given current levels of over-catch, the proposed option would provide economic benefits through the effect of reducing deemed value invoices incurred by fishers by approximately $600,000, based on the most recent complete fishing year. However, these calculations are uncertain and dependent upon an individual operator's ACE holdings and level of over-catch.

11.8. Uncertainties and risks

195. The index used to determine the status of KIN 7 & 8 in relation to the default target (the midwater trawl CPUE index) includes catches of both juvenile and adult fish. Therefore, by including a component of juvenile fish, the midwater CPUE is not a direct index of spawning stock biomass (*SSB*). As the Harvest Strategy Standard uses reference points based on spawning stock biomass, rather than that of the whole population, it is possible that the midwater trawl index overestimates the status of the stock by also indexing juvenile fish. However this was compensated for by the Working Group through choosing a higher default target (40% B_0 rather than 35% B_0)

196. The risk of this overestimation significantly altering the status of the stock is low given the extent to which the midwater trawl index exceeds the default target, and the likelihood that trends in the entire population and spawning stock biomass are not noticeably different.

197. The Working Group also recognised that if the increases in kingfish abundance represented a regime shift, with associated increase in B_0, then the use of historical levels of relative abundance to establish a soft limit would not be appropriate.

12. Alternative options

198. The considerable increase in the abundance of kingfish across all four stocks under review (KIN 2, 3, 7 & 8) provides the potential for a range of management options. The options proposed in this paper represent a selection of the alternative management approaches that could be considered.

199. To inform final advice to the Minister, Fisheries New Zealand seeks information from tangata whenua and stakeholders regarding their views on whether there are alternative options that should be considered in the management of KIN 2, 3, 7 & 8. In particular, Fisheries New Zealand seeks views on the proportional allocation of the TAC and the deemed value rates of kingfish stocks,

12.1. Proportional allocation of the TAC

200. The initial options proposed within this consultation document broadly retain the current proportional allocation of the TAC between the recreational and commercial sectors.

201. The proportional allocation of the KIN 2, 3, 7 & 8 TAC between sectors has either remained unchanged or undergone relatively minor adjustments since introduction to the QMS (see Figure 2) and were based on levels of fishing activity pre 2003. Given the increase in the abundance of kingfish, and changes in the levels of recreational and commercial fishing activity over the last 16 years, these proportional allocations may no longer be appropriate.

202. This issue is particularly pertinent in southern regions where estimated recreational catches of kingfish have not increased at the same rate as those of commercial catches. The management approach taken for KIN 3 and KIN 7 upon introduction to the QMS, was that commercial catches should be managed to unavoidable bycatch levels only.[17] Setting the TACC of KIN 7 at the current level of unavoidable bycatch, and retaining the current proportional allocation of the TAC would require increasing the recreational allowance to almost three times the estimated recreational take. Therefore, setting the TACC so as to provide for current levels of unavoidable bycatch, whilst not over providing for the recreational sector would require a redistribution of the TAC.

203. In addition, increased amounts of kingfish are being taken for customary use on commercial vessels (particularly in KIN 8) which might also indicate that the current proportional allocation is no longer appropriate.

12.2. Deemed value rates

12.2.1. Deemed value rates

204. In recognition of the value of the stocks to recreational fishers, the current deemed value rates of kingfish stocks are set considerably above the landed price (Table 16).

Table 13: Comparison of the annual deemed value rate, the rate at maximum excess and the 2018/19 port price survey index for KIN 2, 3, 7 & 8.

Stock	Annual deemed value rate ($/kg)	Deemed value rate at maximum excess ($/kg)	2018/19 Port price ($/kg)
KIN 2	$8.90	$17.80	$4.82
KIN 3	$4.45	$8.90	$4.13
KIN 7	$8.90	$17.80	$1.82
KIN 8	$8.90	$17.80	$2.93

205. The annual deemed value rates, and rate at maximum excess of KIN 2, 7 & 8 are currently set at the same rates as when the stocks were introduced to the QMS. An $8.90 annual rate was chosen as this was the maximum port price of any kingfish stock reported by any licenced fish receiver prior to 2003 (with the rate at maximum excess set at 200% of the annual rate).

206. The deemed value rates of KIN 3 were formerly set at the same levels as those of other kingfish stocks. However from 1 October 2019, the annual deemed value rates, and each step on the differential schedule were reduced by 50%.

12.2.2. Review of deemed value rates

207. The current review of the management settings of kingfish provides the opportunity to also consider a review of the deemed values regime.

208. Deemed values function within the context of the other management settings associated with the stock. Catches in excess of the available ACE do not necessarily indicate a problem with the deemed value rates of a stock. Rather, catches in excess of the available ACE (either at the level of the stock or the individual), can indicate that the other management settings of the stock require review.

209. Fisheries New Zealand considers a TAC review as the most appropriate management response to an increase in the abundance of kingfish. Therefore, Fisheries New Zealand does not initially propose any changes to the deemed value rates of KIN 2, 3, 7 or 8, but at the same time acknowledges that the appropriateness of the deemed value depends on the level at which the TACCs of kingfish are set.

[17] This approach was continued in 2013 when the TAC of KIN 7 was reviewed, and 2018 when the TAC of KIN 3 was reviewed.

210. If the TACCs are set at a level whereby catches above this amount would result in a sustainability risk, then it would be necessary to increase the deemed value rates so as to tightly constrain catches. Given that the deemed value rates of kingfish are already set above the landed price, such increases would likely have to be considerable. Additionally, increases to the deemed value rates of kingfish would strengthen the incentive to misreport. Therefore a combined compliance and monitoring response would be required to ensure that the increased deemed value rates had the desired effect.

211. If the TACCs were set at an amount whereby some level of catches in excess of the available ACE would not risk sustainability, then high deemed value rates may not be appropriate. Decreases to the deemed value rates of KIN 2, 7 & 8, for example to those applicable to KIN 3 (Table 16), would lessen the incentive to misreport and reduce the financial costs incurred by fishers for catching in excess of the available ACE. However, the extent to which reduced deemed value rates would incentive fishers to avoid kingfish (where possible) and return all live kingfish to the sea is unknown.

212. Given the above, Fisheries New Zealand seeks views from tangata whenua and stakeholders regarding what deemed value response(s), if any, should accompany changes to the TACs of KIN 2, 3, 7 & 8.

13. Environmental interactions

213. Fisheries New Zealand considers it highly unlikely that the options proposed in this paper will result in the initiation of a target fishery for kingfish, with any additional ACE made available through TACC increases expected to be used to balance against kingfish taken as bycatch.

214. As Fisheries New Zealand does not expect there to be an increase in commercial fishing effort as a consequence of the proposed options, the impact of the proposed options on the wider marine environment are likely to be negligible.

215. Anecdotal information indicates that kingfish is a ‘choke species’ for some inshore fishers (i.e. the unavailability of kingfish ACE constrains fishing activity given the high financial costs associated with not balancing catch against ACE). Fisheries New Zealand is therefore seeking further information on how the availability of kingfish ACE will impact fishing activity, so as to determine what impacts the proposed changes will have on other fish stocks and the marine environment.

14. Future considerations

216. Fisheries New Zealand recognises the importance of kingfish to all sectors. Therefore, alongside the options proposed in this paper, ongoing monitoring of the status of kingfish stocks through CPUE analysis, stock assessments and other methods is planned so as to ensure that appropriate adjustments can be made to address any future sustainability risks or management issues. To enable responsive management, Fisheries New Zealand intends to develop a long-term monitoring approach for kingfish to ensure that adequate data is collected to inform future management decisions.

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

- What management target do you think should be set for kingfish stocks? Why
- Which option(s) do you support for revising the TACs and allowances? Why?
- If you do not support any of the options listed, what alternative(s) should be considered? Why?
- If TACs are increased do you support a proportional increase in allowances? Why?
- Are the allowances for customary fishing appropriate? Why?

- We ask tangata whenua to provide any additional information you may have on customary catch.
- Are the allowances for recreational fishing appropriate? Why?
- Are the allowances for other sources of mortality appropriate? Why?
- What other management controls or approaches should be considered for the management of kingfish? Why?

217. Please provide detailed, verifiable information and rationale to support your views.

16. Referenced reports

Draft National Inshore Finfish Fisheries Plan (2019): https://www.fisheries.govt.nz/dmsdocument/38045-national-inshore-finfish-fisheries-plan-draft

Fisheries Assessment Plenary May 2020: https://www.fisheries.govt.nz/news-and-resources/science-and-research/fisheries-research/

Harvest Strategy Standard for New Zealand Fisheries (2008): https://fs.fish.govt.nz/Doc/16543/harveststrategyfinal.pdf.ashx

Holdsworth, J.C.; McKenzie, J.R.; Walsh, C.; Bian. R.; Ó Maolagáin, C. (2016). Catch-at-age of yellowtail kingfish (*Seriola lalandi*) caught by New Zealand recreational fishers, 2014–15: https://www.teururakau.govt.nz/dmsdocument/14725/direct

McKenzie, J.; Smith, M.; Watson, T.; Francis, M.; Ó Maolagáin, C.; Poortenaar, C.; Holdsworth, J. (2014). Age, growth, maturity and natural mortality of New Zealand kingfish (*Seriola lalandi lalandi*): http://docs.niwa.co.nz/library/public/FAR-2014-03.pdf

National Panel Survey of Marine Recreational Fishers 2011–12: Harvest Estimates. New Zealand Fisheries Assessment Report 2014/67: https://www.mpi.govt.nz/dmsdocument/4719-far-201467-national-panel-survey-of-marine-recreational-fishers-201112-harvest-estimates

National Panel Survey of Marine Recreational Fishers 2017–18: Harvest Estimates. New Zealand Fisheries Assessment Report 2019/24: https://www.mpi.govt.nz/dmsdocument/36792-far-201924-national-panel-survey-of-marine-recreational-fishers-201718

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. 104 p.: https://www.mpi.govt.nz/travel-and-recreation/fishing/national-survey-of-recreational-fishers/

Operational Guidelines for New Zealand's Harvest Strategy Standard (2011): https://fs.fish.govt.nz/Doc/23081/Operational_Guidelines_for_HSS_rev_1_Jun_2011.pdf.pdf.ashx

Review of sustainability and other management controls for kingfish (KIN 7) (2013). MPI Discussion Paper No 2013/18: https://www.agriculture.govt.nz/dmsdocument/3499/direct

Review of sustainability measures for October 2018/19 fishing year (2018). Fisheries New Zealand Decision Paper: https://www.mpi.govt.nz/dmsdocument/30810-review-of-sustainability-measures-for-1-october-2018-final-decision-document

Smith, P J; Diggles, B; McKenzie, J; Kim, S; Ó Maolagáin, C; Notman, P; Griggs, L H (2004) Kingfish stock structure. Final Research Report for Ministry of Fisheries Project KIN2002/01 Objective 1. 29 p. https://fs.fish.govt.nz/Doc/22652/KIN200201%20Kingfish%20stock%20structure%20Objective%201%20final.pdf.ashx

Value of New Zealand Recreational Fishing. Final Report of Project REC9801 (1999). Undertaken for the New Zealand Ministry of Fisheries by the South Australian Centre for Economic Studies.

Waitangi Tribunal. (1988). Muriwhenua fishing report. Department of Justice, Wellington: https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68478237/Muriwhenua%20Fishing%20Report%201988.compressed.pdf

17. How to get more information and have your say

218. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 1 July 2020.

219. Please see the Fisheries New Zealand sustainability consultation webpage (https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-october-2020/) 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.