Fisheries New Zealand
Tini a Tangaroa

Review of Sustainability Measures for Yellow-eyed Mullet (YEM 9) for 2021/22

Fisheries NZ Discussion Paper No: 2020/31

ISBN No: 978-1-99-004369-7 (online)
ISSN No: 2624-0165 (online)

December 2020

New Zealand Government

Disclaimer

While every effort has been made to ensure the information in this publication is accurate, Fisheries New Zealand does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information.

Contents

Page

1 Stock being reviewed

Yellow-eyed Mullet (YEM 9) – Waikato, West Coast Auckland and Northland

Aldrichetta forsteri, herring, aua, kanae

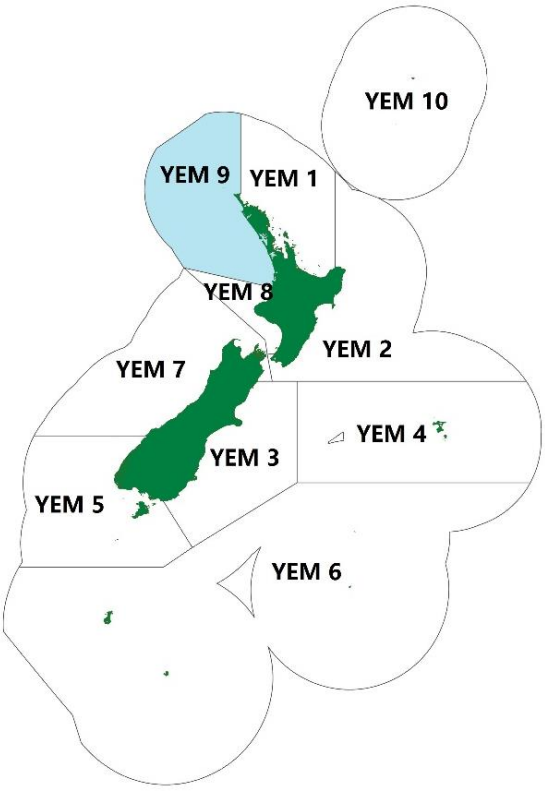

Figure 1: Quota Management Areas (QMAs) for yellow-eyed mullet, with YEM 9 highlighted.

2 Summary

1. Fisheries New Zealand is reviewing the sustainability measures for yellow-eyed mullet in Quota Management Area YEM 9 for the 1 October 2021 fishing year (Figure 1).

2. The review of YEM 9 addresses a potential sustainability concern with the current management settings. This concern arises from several factors: a consistent low level of catch in comparison to the Total Allowable Commercial Catch (TACC), known environmental degradation of some yellow-eyed mullet estuarine and harbour habitats, and the potential for localised depletion in the Manukau Harbour. Further to this, Fisheries New Zealand recognises that yellow-eyed mullet is an important food source for marine mammals, seabirds, and predatory fishes, and that appropriate management settings for YEM 9 should consider their ecosystem role as prey.

3. There are no estimates of current or reference biomass, nor sustainable yield, for YEM 9. It is not known whether the current management settings would ensure the long-term sustainability of the stock, nor whether current catch levels are sustainable.

4. Fisheries New Zealand proposes the following management options:

    - **Option 1** is to maintain the status quo Total Allowable Catch (TAC) and reduce the TACC by one tonne in order to create an allowance for other sources of mortality caused by fishing of one tonne.

    - **Option 2** is to reduce the TAC of YEM 9 by 12 tonnes, the TACC by 13 tonnes and set a one tonne allowance for other sources of mortality caused by fishing. This option

aims to reduce the potential sustainability risk associated with the current management settings for this low information stock by responding to the under catch evident in the current commercial catch allowance. While the TACC proposed in Option 2 is unlikely to actively constrain commercial catch at current levels, the change is intended to discourage further growth/expansion in this fishery until more information on the status of this stock can be obtained.

- **Option 3** is to reduce the TAC by 19 tonnes and the TACC by 20 tonnes and set a one tonne allowance for other sources of mortality caused by fishing. This option aims to significantly reduce the potential sustainability risk associated with the management settings. This Option is likely to actively constrain commercial catch.

5. No changes are proposed to allowances for recreational and customary non-commercial take.

6. Fisheries New Zealand is seeking feedback and submissions on proposed reductions to the TAC and TACC for YEM 9 and proposed allowance for other sources of mortality caused by fishing. Fisheries New Zealand also welcomes any feedback on the current allowances for recreational and customary take.

3 About the stock

7. YEM 9 is a shared fishery, targeted by commercial and recreational fishers in harbours and estuaries. It is also caught as bycatch by fishers targeting flatfish (FLA) and grey mullet (GMU).

8. Yellow-eyed mullet is a schooling finfish species that occurs commonly in the shallow coastal waters, estuaries, and lower river systems of New Zealand, Norfolk Island, and south and western Australia. In New Zealand, it is found from North Cape to Stewart Island.

9. It is a fast growing, short-lived species: research indicates the age at first spawning is approximately three years and the maximum age is likely seven years. Stock structure of yellow-eyed mullet in New Zealand waters is unknown.

10. Yellow-eyed mullet appear to leave their estuarine habitat to spawn in coastal waters over the summer from late December to mid-March. However, there is no information available on the age of recruitment into estuarine systems of New Zealand waters. Within estuaries and river systems, yellow-eyed mullet are separated to some extent by age, with older fish preferring more saline water and juveniles sometimes found in freshwater. The larger fish also prefer deeper water than juveniles.

11. Yellow-eyed mullet are omnivores, feeding on algae, benthic detritus, small invertebrates, polychaete worms, and fish.

4 Quota Management System

12. Yellow eyed mullet was introduced into the Quota Management System (QMS) in 1998. At that time, a TAC, TACC, and recreational and customary allowances for YEM 9 were set. No allowance was made for other sources of mortality caused by fishing. The YEM 9 stock has not been reviewed since its introduction in the QMS.[1]

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

[1] The May 2020 Plenary shows a TACC for YEM 9 of 33t for the fishing years of 1998-2001, but Fisheries New Zealand believes this to be an error. The introductory paper for YEM 9 recommended a TACC of 30t in 1998 and Fisheries New Zealand has been unable to locate any information indicating a deviation from this recommendation was made. Additionally, Fisheries New Zealand has been unable to locate any record of a subsequent review of the YEM 9 management settings in 2001.

5 Legal basis for managing fisheries in New Zealand

14. The Fisheries Act 1996 provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* at https://www.mpi.govt.nz/dmsdocument/43030 for more information.

15. Section 13 of the Act requires the Minister to set a TAC that enables the stock to be maintained at or above a level that can produce the maximum sustainable yield (B_{MSY}).

16. However, if the Minister is satisfied that YEM 9's current biomass level, or the level that can produce the maximum sustainable yield, is unable to be reliably estimated using the best available information (which is often the case for low knowledge stocks), Section 13(2A) provides that the Minister must use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above a level that can produce B_{MSY}.

6 Treaty of Waitangi obligations

6.1 Input and participation of tangata whenua

17. Input and participation into the sustainability decision-making process is provided through Iwi Fisheries Forums, which have been established for that purpose. Iwi Fisheries Forums ideally develop an Iwi Fisheries Forum Plan that describes how the iwi in the Forum exercise kaitiakitanga over the fisheries of importance to them, and their objectives for the management of their interest in fisheries[2]. Particular regard will be given to kaitiakitanga when making sustainability decisions.

18. Ahead of the November 2020 Iwi Fisheries Forum meetings, a short document describing the YEM 9 stock, Fisheries New Zealand's rationale for review, and initial management proposals was circulated to the northern forums with a potential interest in YEM 9: Te Hiku o Te Ika, Nga Hapu o Te Uru o Tainui, and the Mid-North.

19. Fisheries management representatives attended the November meetings of both Te Hiku o Te Ika and the Mid-North, while the November meeting of Nga Hapu o Te Uru o Tainui was postponed. The Mid-North expressed support for Fisheries New Zealand's review of YEM 9 and supported a decrease to the TAC and TACC. Te Hiku o Te Ika did not provide any specific feedback on the review of YEM 9 at its meeting.

20. To date, Fisheries New Zealand has not received any written feedback on the YEM 9 review from any of the northern Iwi Fisheries Forum members.

21. Fisheries New Zealand seeks further input and information on the proposed options for YEM 9 from tangata whenua during consultation and before final advice and recommendations are made.

6.2 Kaitiakitanga

22. YEM 9 is listed as a taonga species by Te Hiku o Te Ika and Nga Hapu o Te Uru o Tainui in their respective Iwi Fisheries Forum plans. Fisheries New Zealand considers that the management options presented in this consultation paper are in keeping with objectives of the iwi fisheries plan which generally relate to active engagement with iwi and the maintenance of healthy and sustainable fisheries, but seeks further input from iwi to help inform final advice on this review.

[2] Not all Iwi Fisheries Forums have developed plans at this stage, though work in this area is ongoing.

23. Table 1 lists the customary fisheries areas that fall within the quota management area of YEM 9.

24. Commercial fishing is not permitted within mātaitai reserves unless bylaws state otherwise. Recreational fishing is allowed, but may also be restricted under bylaws. All types of fishing are permitted within a Taiāpure unless the local community initiate a management process to implement further regulation. To date, none of the customary fisheries areas listed in Table 1 have implemented regulations restricting customary or recreational take of YEM 9.

Table 1: Customary Fisheries Areas in YEM 9

Area	Management Type
Aotea Harbour Mātaitai	Mātaitai Reserve
Marokopa Mātaitai	
Kawhia Aotea Taiāpure	Taiāpure

7 Relevant plans, strategies, statements and context

7.1 Draft National Inshore Finfish Fisheries Plan (2019)

25. The Draft National Inshore Finfish Fisheries Plan (2019) provides guidance on management objectives and strategies for finfish fisheries and the operational management of inshore finfish fisheries for the next five years. Public consultation on the draft plan closed on 19 February 2020.

26. The Finfish Plan is aimed at progressing New Zealand towards more Ecosystem-Based Fisheries Management (EBFM). EBFM is a holistic way of managing fisheries and marine resources that takes into account the entire ecosystem, recognising the physical, biological, economic, and social interactions among fisheries and affected ecosystem components, including humans. At a high level, EBFM seeks to optimise benefits among a diverse set of societal goals while maintaining the productivity, resilience and sustainability of ecosystems.

27. Stocks are grouped within the Finfish Plan, with management approaches and objectives tailored accordingly for each group. YEM 9 has been assigned to Group 3, which consists of stocks that provide lower overall levels of benefit and use.

28. Group 3 stocks are monitored against trends in catch over time and any other relevant information. However, the inclusion of a stock in a management group does not prevent its movement to a different group. A stock like YEM 9 may be moved into a higher management group if there is a desire to develop the fishery, provided sufficient data are available to meet the monitoring standards of the new group.

8 Recent catch levels and trends

8.1 Commercial

29. When introduced into the Quota Management System in 1998, YEM 9 management settings were based on average landings during the period of 1982-1997, with an additional 10% added to recognize that YEM 9 is both a bycatch and a target species. Landings in the 1985-86 and 1986-87 fishing years were around three times greater than the average annual landings across the rest of the 1982-97 period.

30. The TACC for YEM 9 has never been fully caught. Since its introduction in 1998, only 37% of the TACC has been caught on average annually. In the past 10 years, this figure has dropped to 35%. Landings appear to fluctuate about this low level without trend (Figure 2).

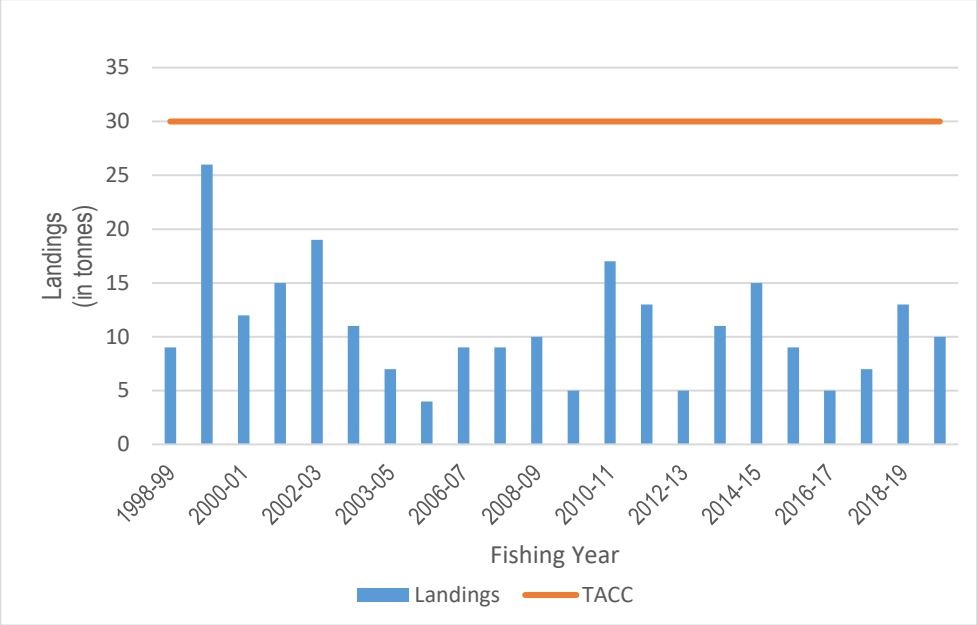

Figure 2: Annual YEM 9 landings from introduction to the QMS to present.

31. Fishers target yellow-eyed mullet with fine (55-65 mm) mesh set nets and ring nets in shallow coastal waters. Strong seasonal trends are evident in the landings data for each QMA with annual peaks mostly in July–August, indicating a winter fishery.

32. The target YEM 9 fishery is localised, exhibiting patterns of catch that could carry a risk of local depletion in some areas. In recent years, the vast majority of YEM 9 estimated catch has been taken from statistical area 043, the Manukau Harbour.

33. YEM 9 are also caught as welcome bycatch by fishers targeting flatfish (FLA) with set nets and fishers targeting grey mullet (GMU) with ring nets and set nets. A large majority of YEM 9 taken as bycatch is also taken in the Manukau Harbour.

8.2 Customary Māori

34. Fisheries New Zealand holds no specific information to quantify customary take of YEM 9. Customary reports use a general code for all mullet species. It is not possible to differentiate customary authorisations referring to yellow-eyed mullet from those referring to grey mullet.

8.3 Recreational

35. Yellow-eyed mullet are a popular recreational species throughout New Zealand, as their distribution and habitat preferences make them easily accessible to inshore fishers. The most recent National Panel Survey of Marine Recreational (NPS) found that yellow-eyed mullet are most often taken by recreational fishers using rod and line, followed by fishers using nets.

36. The NPS estimated a recreational harvest of 4.3 tonnes in YEM 9 in the 2017-18 fishing year (Table 2). This estimate slightly exceeds the four tonne allowance allocated to the recreational sector, although there is a reasonable degree of uncertainty associated with the harvest estimate.

37. There is no recreational daily limit or minimum legal size limit for yellow-eyed mullet.

38. The minimum mesh size for recreational fishers targeting yellow-eyed mullet with set nets is 25 mm.

Table 2: Recreational harvest estimates for YEM 9.

Year	Method	Number of fish	Total weight (t)	CV
2011/12	Panel survey	20,535	4.1 t	0.34
2017/18	Panel Survey	14,830	4.3 t	0.49

9 Current state of the stock

39. A lack of historical effort data has prevented Fisheries New Zealand from using Catch Per Unit Effort (CPUE) as an index of abundance. There are no estimates of current or reference biomass, nor an estimate of fishing mortality. As such, yield for YEM 9 cannot be estimated and it is not known whether current catch levels are sustainable. In the absence of a defined target and limits, Fisheries New Zealand relies on the draft Inshore Finfish Plan approach of monitoring the stock against trends in catch over time to ensure sustainability.

40. The localised nature of this fishery, along with the magnitude of YEM 9 catch that has been taken from the Manukau Harbour in recent years, has raised concerns about localised depletion. However, information on YEM 9 movement patterns is lacking. Without an idea of how recent landings compare to sustainable yield, and without an understanding of how localised YEM 9 populations are, it is not possible to estimate the level of risk extraction poses to YEM 9 in Manukau Harbour.

41. Localised depletion of YEM 9 could affect food availability for, and the foraging habits of, organisms that feed on yellow-eyed mullet in the harbour.

42. Degradation of some YEM 9 estuarine and harbour habitat is known to have occurred, including in the Manukau Harbour which, in 2018, received an E grade on its Marine Report Card produced by the Auckland Council. The impact of this degradation on YEM 9 productivity is unknown.

10 Current and proposed TAC, TACC and allowance settings

43. Three options are proposed for the TAC, TACC, and allowances for YEM 9. Fisheries New Zealand invites views on these proposed options (Table 3).

Table 3: Summary of current and proposed catch settings for YEM 9 from 1 October 2021. Figures are all in tonnes. Figures in parentheses indicate the change from current settings.

			Allowances		
Option	**TAC**	**TACC**	**Customary Māori**	**Recreational**	**All other mortality caused by fishing**
Current settings	38	30	4	4	-
Option 1 *(Set all other mortality)*	38	29 ↓ (1 t)	4	4	1
Option 2	26 ↓ (12 t)	17 ↓ (13 t)	4	4	1
Option 3	19 ↓ (19 t)	10 ↓ (20 t)	4	4	1

10.1 Option 1

44. Maintaining the status quo TAC and reducing the TACC by one tonne to create an allowance for other sources of mortality caused by fishing preserves most of the potential catch in the current management settings. This option provides continuity for the commercial sector and ensures the sector has the flexibility to increase its catch if it desires and is able to do so.

45. However, given the consistently low trend in catch in comparison to the TACC, the limited information available on stock status, and the value of yellow-eyed mullet to the ecosystem, maintaining the status quo TAC at its current setting could present a sustainability risk to YEM 9 and potentially the broader marine food chain.

46. Maintaining the current settings would also fail to address concerns of potential localised depletion within the Manukau Harbour.

10.2 Option 2

47. By reducing the TAC to 26 tonnes and the TACC to 17 tonnes, Option 2 removes the under catch evident in the current settings. Provided that recent trends in the YEM 9 fishery persist, this setting is unlikely to actively constrain catch: since 2010, annual commercial landings of YEM 9 have peaked at 16.9 tonnes (in the 2010-11 fishing year). It is therefore unlikely that fishers would need to adjust their behaviour in response to this proposed change.

48. By reducing the current TACC setting, Option 2 would discourage further expansion in this fishery, reducing the sustainability risk of management settings while Fisheries New Zealand develops a method to monitor this low information stock.

49. This option does not address concerns about the potential for localised depletion in the Manukau Harbour.

10.3 Option 3

50. Option 3 would set a TAC and a TACC that actively constrain catch below recent levels based on average recent landings. The average annual landings of YEM 9 between 2001-2020 were 10.1 tonnes, while the average annual landings from 2010-2020 were 10.4 tonnes. Setting a TACC of 10 tonnes would actively constrain catch in addition to discouraging further growth in this fishery.

51. Option 3 provides a more precautionary management setting for this low information stock. Such an approach may be warranted, considering its role as forage for other marine organisms, known degradation of its habitat, and the fact that YEM 9 is listed as a taonga species by two iwi fisheries forums.

52. Assuming future catches mirror recent landings, fishers would likely need to change their behaviour in order to avoid incurring deemed values in some fishing years under Option 3.

53. A TACC that constrains catch in the broader QMA could reduce the risk of localised depletion in a sub-area such as the Manukau Harbour. However, given that landings have averaged 10.5 tonnes over the past 10 years and Option 3 is proposing a TACC of 10 tonnes, Option 3 is unlikely to appreciably reduce this risk.

10.4 Additional Management Options to Address Risk of Localised Depletion

Additional management options could be explored to manage the YEM 9 fishery. Fisheries New Zealand seeks feedback on what other management measures may be appropriate.

10.5 Allowance for other sources of mortality caused by fishing

54. Each of the three options includes a new one tonne allowance for other sources of mortality caused by fishing. This allowance is intended to account for any mortality to a fish stock that occurs due to fishing activity but is not otherwise accounted for in the TAC.

55. For YEM 9, there is uncertainty regarding the appropriate setting for this allowance. The potential sources of other mortality for YEM 9 could include: unreported commercial bycatch, mortality associated with injury from smaller yellow-eyed mullet passing through set net mesh, as yellow-eyed mullet are known to be fragile; mortality associated with recreational catch and

release, mortality associated with predation of yellow-eyed mullet in set nets; and mortality associated with the accidental loss or damage of fishing gear, particularly set nets.

56. In the absence of information to quantify the mortality associated with these sources, Fisheries New Zealand proposes a nominal allowance of one tonne. This is considered appropriate given the biological characteristics of the stock, and expected mortality caused as a result of gear interactions and recreational catch and release.

11 Uncertainties and risks

57. There is little information available on which to gauge the stock status of YEM 9 and there is uncertainty regarding the sustainability of current management settings and catch levels. The options proposed respond to the ongoing trend of landings being well below the TACC, which may signal a sustainability concern.

58. Stock structure and movement of YEM 9 are unknown, so localised depletion may remain a risk.

59. The extent to which environmental degradation is impacting YEM 9 is largely unknown, however there is information to suggest that key estuarine habitats, such as the Manukau Harbour, are likely to have reduced carrying capacity.

12 Environmental interactions

60. The key environmental interactions with this fishery which must be taken into account when considering sustainability measures relate to the gear with which YEM 9 is targeted and to the role yellow-eyed mullet play as a food source for marine mammals, seabirds, and predatory fishes in the marine food chain.

61. Concern has been expressed by the Plenary Working Group about the effects of the small-meshed nets used to fish yellow-eyed mullet on other species within estuarine systems. Kahawai (KAH 8) is the main bycatch species of the YEM 9 target fishery, followed by grey mullet (GMU 1), flatfish (FLA 1), parore (PAR 9), trevally (TRE 7), and eagle ray (EGR).

62. Of these species commonly caught by the YEM 9 target fishery, there is only a known sustainability concern with FLA 1. In the 2018 October sustainability review, the Minister reduced the FLA 1 TAC by 44% and the TACC by 25% in response to a long-term decline in the commercial catch of FLA 1, in conjunction with declining CPUEs in both the Kaipara and the Manukau Harbours.

63. Because of their small size, yellow-eyed mullet are vulnerable to predation by a variety of marine predators. Research has recorded yellow-eyed mullet in the diets of gannets and other coastal seabirds, as well as marine mammals such as dolphins and seals. Yellow-eyed mullet have also been recorded in the diet of barracoutas and are described in scientific literature as an important source of food for kahawai.

64. While Fisheries New Zealand lacks a quantification of yellow-eyed mullet's value to the marine ecosystem, two sections of the Act may require that this value be taken into consideration when setting management measures:

    - Section 9(a) of the Act requires that the Minister take into account the environmental principle that associated or dependent species should be maintained above a level that ensures their long-term viability. The impact of yellow-eyed mullet removals by fishing on the food availability for associated or dependent species like seabirds and marine mammals needs to be considered.

- If the Minister considers the information available is insufficient to estimate the level of the stock which can produce the maximum sustainable yield, Section 13(2A) obliges the Minister to have regard to the interdependence of stocks when setting a TAC. In this case, it would be necessary to consider how a forage fish fishery like YEM 9 may affect the viability of stocks that feed on yellow-eyed mullet, such as kahawai.

13 Deemed values

65. Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements. Deemed value rates for YEM 9 are shown in Table 4.

Table 4: Current deemed value rates ($/kg) for YEM 9.

Stock	Interim	Annual 100-120%	Differential rates ($/kg) for excess catch (% of ACE)				
			120-140%	140-160%	160-180%	180-200%	>200%
YEM 9	0.3000	0.3300	0.33	0.33	0.33	0.33	0.33

66. Figure 3 shows the average Annual Catch Entitlement (ACE) transfer price and the average port price in comparison to the annual deemed value rate of YEM 9 from the 2008-09 fishing year to the 2019-20 fishing year. The average ACE transfer price for the 2019-20 fishing year was $0.2215 per kg of yellow-eyed mullet, which is well below the annual deemed value rate of $0.33 per kg.

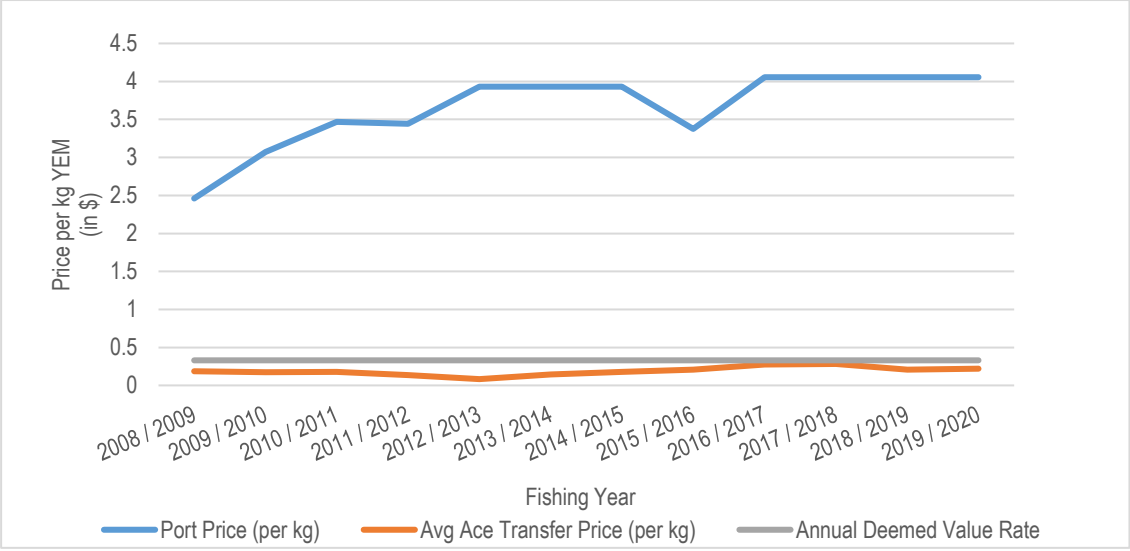

Figure 3: Average port price and average ACE transfer price in comparison to the annual deemed value rate for YEM 9, 2008-2020.

67. Port price per kg of YEM 9 has increased by 811% between the 2001-02 fishing year and the 2019-20 fishing year (Figure 4).

68. If a decision was made to reduce the TACC, consideration of the deemed value settings may be appropriate.

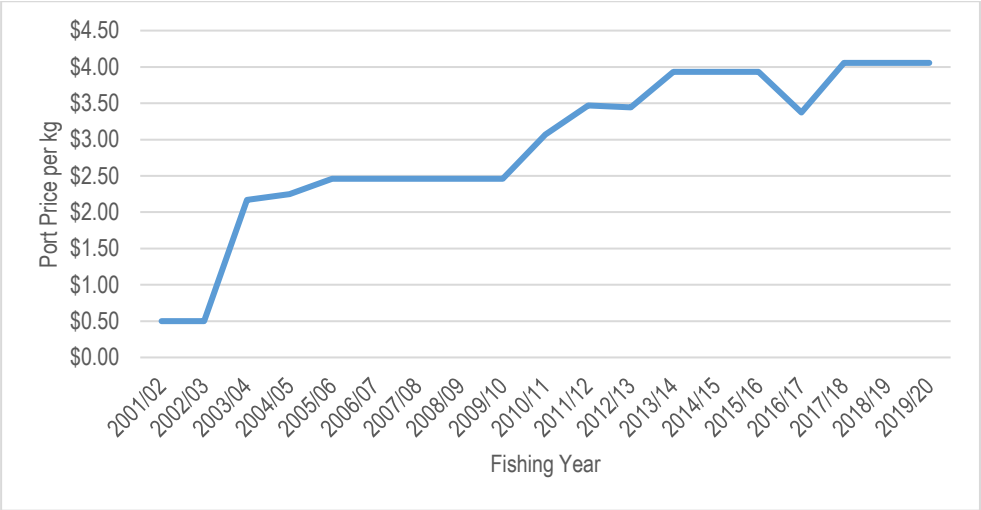

Figure 4: YEM 9 Port price by Fishing Year 2001-2020.

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

- Which option do you support for revising the TAC and allowances? Why?
- If you do not support any of the options listed, what alternative(s) should be considered? Why?
- Are the allowances for other sources of mortality appropriate? Why?

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

15 How to get more information and have your say

70. Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. Consultation closes at 5pm on 5 February 2021.

71. Please see the Fisheries New Zealand sustainability consultation webpage (https://www.mpi.govt.nz/consultations/review-of-sustainability-measures-2021-april-round/) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access to the webpage or require hard copies of documents or any other information, please email FMSubmissions@mpi.govt.nz.

16 Referenced reports

Auckland and Kermadec Fishing Rules: https://www.fisheries.govt.nz/travel-recreation/fishing/fishing-rules/auckland-kermadec-fishing-rules/

Auckland Council. (2018). State of Auckland Marine Report Card: Manukau Harbour Reporting Area. https://knowledgeauckland.org.nz/media/1232/soa-rpt-card-2018-marine-manukau.pdf

Cook, D.G. et al. (2018). Tagging investigations with small estuarine-associated fish: tag evaluation, capture methodologies and assessment of capture stress and survival in yellow-eyed mullet *Aldrichetta forsteri*. Marine and Freshwater Research. 69, 1595-1603.

Curtis, T.D. & Shima, J.S. (2005). Geographic and sex-specification variation in growth of yellow-eyed mullet, Aldrichetta forsteri, from estuaries around New Zealand. New Zealand Journal of Marine and Freshwater Research 39(6).

Fisheries New Zealand. (2020). Guidelines for the review of deemed value rates for stocks managed under the Quota Management System. https://www.mpi.govt.nz/dmsdocument/40250/direct

Fisheries New Zealand. (2011). Operational Guidelines for New Zealand's Harvest Strategy Standard (2011): https://www.fisheries.govt.nz/dmsdocument/19706-OPERATIONAL-GUIDELINES-FOR-NEW-ZEALANDS-HARVEST-STRATEGY-STANDARD

Fisheries New Zealand (2020). Fisheries Assessment Plenary, May 2020: stock assessments and stock status. Compiled by the Fisheries Science and Information Group, Fisheries New Zealand, Wellington, New Zealand. 1746p: https://www.fisheries.govt.nz/dmsdocument/40787-Fisheries-Assessment-Plenary-May-2020-Stock-Assessments-and-Stock-Status-Volume-3-Red-Cod-to-Yellow-Eyed-Mullet

Fisheries (Amateur Fishing) Regulations 2013:
http://www.legislation.govt.nz/regulation/public/2013/0482/latest/DLM3629901.html?src=qs

Fisheries (Commercial Fishing) Regulations 2001:
http://www.legislation.govt.nz/regulation/public/2001/0253/latest/whole.html

Kelly, S. (2008). Environmental condition and values of Manukau Harbour. Prepared by Coast and Catchment Ltd. for Auckland Regional Council. Auckland Regional Council Technical Report 2009/112
http://www.aucklandcity.govt.nz/council/documents/technicalpublications/TR2009_112%20-%20Environmental%20Condition%20and%20Values%20of%20Manukau%20Harbour.pdf

Morrison, M.A. et al. (2014). Habitats and areas of particular significance for coastal finfish fisheries management in New Zealand: A review of concepts and life history knowledge, and suggestions for future research. New Zealand Aquatic Environment and Biodiversity Report No.125.
https://fs.fish.govt.nz/Doc/23523/AEBR_125_2638_ENV2010-03%20Obj%201-2,%20MS1,%203,%204,%206.pdf.ashx

Paul, L.J. and Taylor, P.R. (1998). A summary of the biology, recreational and commercial landings, and stock assessment of yellow-eyed mullet, *Aldrichetta forsteri*. New Zealand Fisheries Assessment Research Document 98/17. 35 p.
https://fs.fish.govt.nz/Doc/17643/1998%20FARDs/98_17_FARD.pdf.ashx

Wynne-Jones, J et al. (2019). National Panel Survey of Marine Recreational Fishers 2017–2018. New Zealand Fisheries Assessment Report 2019/24: https://www.mpi.govt.nz/dmsdocument/36792/direct

Wynne-Jones, J et al. (2014) 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/direct