Experimental closure of the forage fish (ANC 1, SPR 1, GAR 1, YEM 1, JMA 1 & EMA 1) fisheries

Submission to Fisheries New Zealand

20 July 2025

Kokowhāwhā / Anchovies sheltering post 'work-up' in the Noises Islands November 2024. Photo Shaun Lee.

STET is a social enterprise working on restoration policy and projects. We have a strong interest in the Hauraki Gulf's ecological health and support Management Action 1.3.2 of the Hauraki Gulf Fisheries Plan[1] to safeguard forage fish and the predators that depend on them.

Executive summary

None of the proposed catch-limit changes will reduce landings of forage fish. Therefore the options do not address the core concern—declining abundance of forage fish and flow-on stress to marine predators.

The longer we ignore the signs, the harder it is to recover. That's not sustainable management—it's negligence.

[1] https://www.mpi.govt.nz/dmsdocument/58396-Hauraki-Gulf-Fisheries-Plan/

STET recommends a stronger, experiment-based approach: closing fisheries and measuring the response in seabird, marine-mammal and predator-fish populations to inform genuine ecosystem-based fisheries management.

Why the proposed options do not reduce fishing pressure on the Hauraki Gulf Marine Park

Stock	**Recent annual landings** (tonnes)	**Current TACC** (tonnes)	**Option 1 TACC** (status quo tonnes)	**Option 2 TACC** (tonnes)	**Option 3 TACC** (tonnes)	**Head-room vs landings** (tonnes)
ANC 1	≤ 10 every year since 1993	200	200	100	50	Option 1 ≈ +190 Option 2 ≈ +90 Option 3 ≈ +40
SPR 1	0-3 every year since 2002	70	70	35	15	Option 1 ≈ +69 Option 2 ≈ +34 Option 3 ≈ +14
GAR 1	17 10-yr mean 26 peak	25	25	20	—	Option 1 ≈ +8 Option 2 ≈ +3
YEM 1	22 (2023/24) 18 10-yr mean	20	20	23	—	Option 1 ≈ –2* Option 2 ≈ +1
JMA 1	7-yr range ≈ 3,000–6,000	10,000	10,000	8,000	7,000	Opt 1 ≈ +4,143 Opt 2 ≈ +2,143 Opt 3 ≈ +1,143
EMA 1	7-yr range ≈ 7,600 – 8,100	7,630	7,630	8,012 (+5 %)	8,393 (+10 %)	Opt 1 ≈ –331 * Opt 2 ≈ +51 Opt 3 ≈ +432

RED = TACC has no constraint on landings. GREEN = TACC reduces landings.

*The fishery is presently over-catching, and fishers must rely on Annual Catch Entitlement transfers or pay deemed-value fees to stay compliant.

Ecological context

A workup in FMA 1. Photo Shaun Lee.

Forage fish including kokowhāwhā (anchovy, ANC 1), kupae (sprat, SPR 1), takeke (garfish/piper, GAR 1), aua (yellow-eyed mullet, YEM 1), hautere (jack mackerel, JMA 1) and tawatawa (blue mackerel EMA 1) form the Gulf's "wasp-waist" they graze plankton and funnel that energy to higher predators.

Work-ups of forage fish in the Hauraki Gulf are shrinking and thinning out. A ten-year analysis of 1,658 multi-species feeding events (2011-2020) found the fish-driven work-ups fell markedly over the decade[2].

> *"Work-ups that previously lasted around 30-40 minutes are now lasting little more than a few minute"[3] – Professor Rochelle Constantine*

There is ample anecdotal evidence from the fishing community reporting a similar trend. *"…a distinct lack of pilchard schools … and fewer work-ups in the Gulf…"[4]*

[2] https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.739894/full
[3] https://www.auckland.ac.nz/en/news/2023/05/18/ingenio-feature-saving-our-sea-life.html
[4] https://www.fishing.net.nz/fishing-reports/saltwater-fishing-reports/the-espresso-fishing-report/

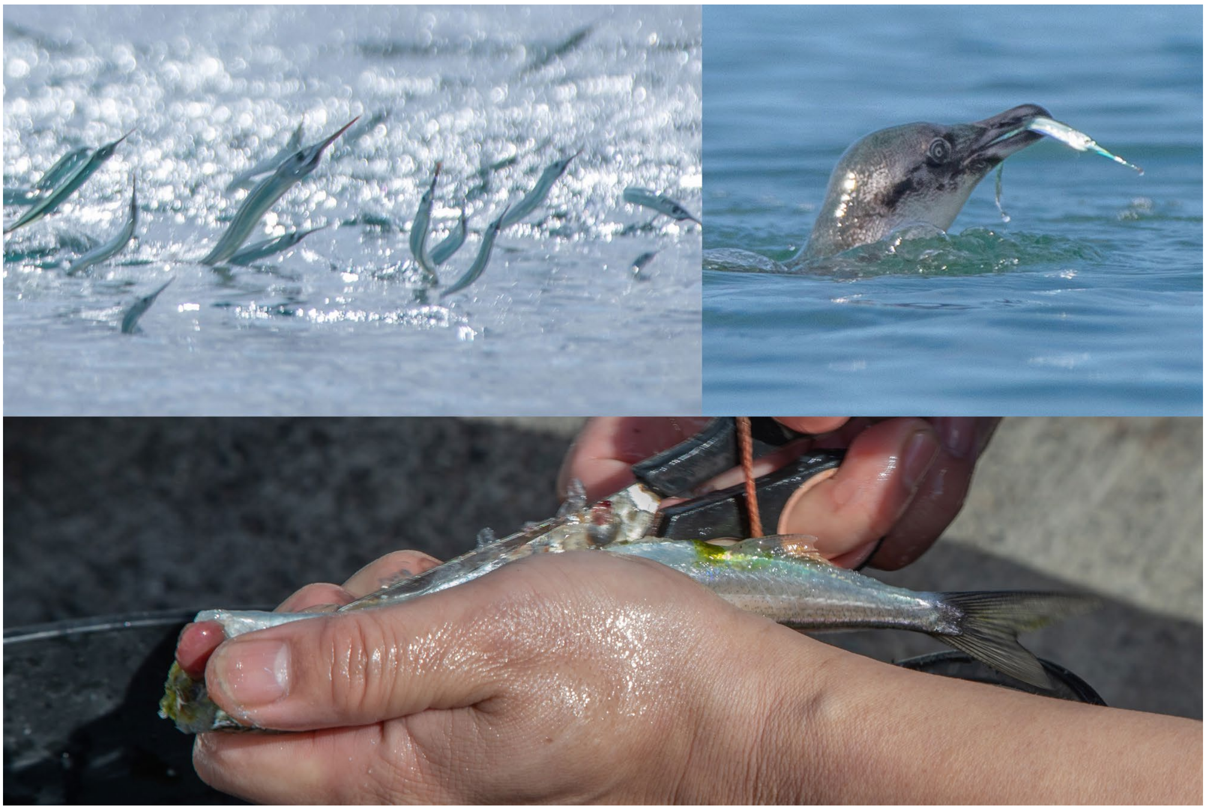
Low populations of forage fish are placing stress across the food web. Signs of this are now being observed:

Bryde's whales now taking krill more often than fish

A 2011-20 analysis of multi-species feeding associations in the Hauraki Gulf shows the resident Bryde's whales have "increasing reliance on zooplankton", with shifts in prey preference away from fish changing the whole predator-seabird dynamic[5]. The authors link this switch to declining availability of schooling fish.

Kororā / little penguin mass-mortality events continue

The State of Our Seabirds 2021[6] report documents repeated die-offs, and its 2023 companion State of Our Gulf[7] update notes a major 2006 and 2020/21 mortality attributed to starvation following prey shortages and marine heatwaves.



TOP: Takeke / Garfish being predated by kororā in Kawau Bay. BOTTOM: Takeke being cut up by a fisherman in Okahu Bay. Photos Shaun Lee.

Tākapu / Australasian gannets and other seabirds moving out of the inner Gulf

Colonies on Horuhoru (Waiheke) have halved from ~2,000 to ~1,000 nests, while outer-Gulf Mahuki has surged to ~6,000, reflecting birds shifting as prey become scarcer. Long-term evidence reinforces the point: a 141-year stable-isotope record from northern Aotearoa

[5] https://www.researchgate.net/publication/358809017_Feeding_tactics_of_resident_Bryde%27s_whales_in_New_Zealand
[6] https://gulfjournal.org.nz/wp-content/uploads/2021/10/SOOS-screen.pdf
[7] https://gulfjournal.org.nz/wp-content/uploads/2023/08/SOER-online.pdf

seabirds shows they have had to forage further offshore over time—an adjustment the authors link to declining near-shore availability of small pelagic prey such as kokowhāwhā and kupae, even though the birds' trophic level has stayed the same.[8] Likewise, a century-scale diet reconstruction for karoro / southern black-backed gulls shows a marked shift from marine to terrestrial foods, driven by declining forage-fish availability and the rise of land-based anthropogenic subsidies.[9]

The longer we ignore the signs, the harder it is to recover. That's not sustainable management—it's negligence.

Broader seabird-diet red flags

The 2021 seabird report[10] highlights rising reliance on low-energy prey (juvenile fish, jellyfish) for several species, altered chick-provisioning rates, and more frequent wrecks of fluttering shearwaters and other species after poor feeding seasons.

Sharks are a fraction of their former abundance.

Mass-balance reconstructions for the Hauraki Gulf estimate that the combined shark guild now sits at about 14% of its pre-human abundance—a collapse quantified in Pinkerton et al.'s food-web model (AEBR 160[11]) and reiterated by MacDiarmid et al.'s top-down reef analysis (AEBR 171[12]). Because sharks are large meso-predators that dampen boom–bust cycles in mid-trophic fish and signal overall ecosystem resilience.

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8 https://www.int-res.com/abstracts/meps/v678/meps13877
9 https://newzealandecology.org/nzje/3597
10 https://gulfjournal.org.nz/wp-content/uploads/2021/10/SOOS-screen.pdf
11 https://www.mpi.govt.nz/dmsdocument/9809-aebr-160-changes-to-the-food-web-of-the-hauraki-gulf-during-the-period-of-human-occupation-a-mass-balance-model-approach
12 https://webstatic.niwa.co.nz/library/NZAEBR-171.pdf

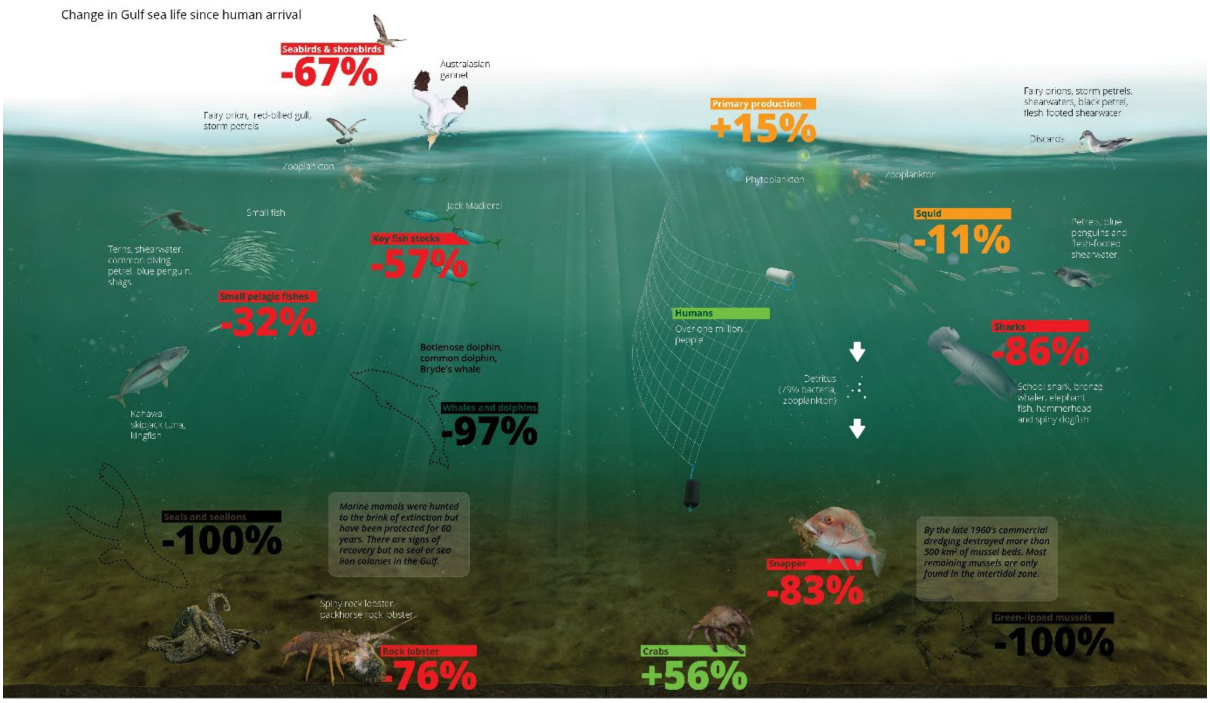

Figure 1. *Pinkerton MH, MacDiarmid A, Beaumont J, et al. Changes to the food web of the Hauraki Gulf during the period of human occupation: a mass balance model approach. Wellington: Ministry for Primary Industries; 2015.*

MacDiarmid AB, McKenzie A, Abraham ER. Top-down effects on rocky reef ecosystems in north-eastern New Zealand: a historic and qualitative modelling approach. Wellington: Ministry for Primary Industries; 2016.

GRAPHICS FROM THE STATE OF OUR GULF 2020

Modelling backs the field signals. AEBR 301 (2023) shows that cutting small- and mid-pelagic biomass by 30 % can drive up to a 20 % decline in seabird, dolphin and predator-fish biomass, while a 20 % boost lifts those predators 10–15 %. The report warns that continued harvest of the Gulf's wasp-waist group – exactly these five stocks – risks destabilising trophic dynamics if predators cannot switch diets.

Sea Change 2017[13] asks Fisheries New Zealand to take an ecosystem-based approach and rebuild every harvested stock—including forage fish—to at least its Harvest Strategy Standard target by 2030 where robust data exist, and by 2040 for the remainder. Yet none of the six forage-fish stocks now under review has a full stock assessment: tawatawa / blue mackerel (EMA 1) is only thought to be near its target (not above), while the status of kokowhāwhā / anchovy, kupae / sprat, takeke / garfish, aua / yellow-eyed mullet and hautere / jack mackerel is unknown. The plan's 2030/2040 rebuilding goal cannot even be measured, let alone met.

Taken together, the evidence underscores that merely tweaking TACCs will not rebuild the forage base. A time-bound closure that includes kokowhāwhā, kupae, takeke, aua, hautere and tawatawa offers the clearest test of whether restoring the wasp-waist can halt or reverse the cascading stress now apparent across the Gulf.

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[13] https://gulfjournal.org.nz/wp-content/uploads/2022/01/5086-SCTTTP-Marine-Spatial-Plan-WR.pdf

Our proposal – a three-year experimental closure for four smaller forage fish populations

Suspend all commercial, recreational and customary take of ANC 1, SPR 1, GAR 1 and YEM 1 from 1 October 2025 to 30 September 2028.

Monitor sentinel predator indicators (e.g. dolphin body-condition, Bryde's whale foraging time, takapu chick growth, seabird diet) alongside acoustic biomass surveys.

Compare pre- and post-closure trends and use the results to recalibrate TAC/TACC settings within an explicit ecosystem-based framework.

Complete the stock assessments requested by Sea Change in 2017.

Rationale

Precaution aligned with the Fisheries Act 1996 s10. When information is "uncertain, unreliable or inadequate," greater caution is required; simply retaining large head-room is not caution.

Supports Management Action 1.3.2 of the Hauraki Gulf Fisheries Plan, which seeks to prevent adverse effects of forage-fish removals on the food-chain

Generates real data. A time-bound closure provides the experimental control missing from decades of passive catch-trend monitoring.

Low utilisation cost. Current annual landings across all four stocks total ~50 t—trivial in economic terms yet potentially pivotal ecologically.

Pilot one-year closures for Jack mackerel (JMA 1) and Blue Mackerel (EMA 1)

Hautere / Jack mackerel in a marine reserve. Photo Shaun Lee.

All three JMA 1 options still leave more than a thousand tonnes of head-room above recent catch, so they would not constrain fishing effort or relieve pressure on the forage base.

Juvenile tawatawa / blue mackerel in a marine reserve. Photo Shaun Lee.

Tawatawa form dense surface schools that attract common dolphins and tākapu, creating mixed-species feeding events[14,15]. Tawatawa / blue mackerel are the single largest forage removal (≈ 8 000 t a year) caught by the same purse-seine fleet that targets hautere and kokowhāwhā. The options provided seek to increase take of this critical energy-conduit species.

Similar recommendations

Suspend all commercial, recreational and customary take of JMA 1 & EMA 1 for one year (1 Oct 2025 to 30 Sep 2026).

Measure ecosystem response over that single year alongside the three-year closure on the four smaller forage species (predator diet, chick growth, marine mammal body-condition).

At 12 months, compare data with pre-closure baselines; decide whether to:

- reopen under Option 3 (7 000 t) if no ecosystem signal emerges, or
- roll the closure for up to two further years if prey-limitation indicators improve.

Complete the stock assessments requested by Sea Change in 2017.

Why a shorter trial is logical

Bigger biomass removed – taking ~6 000 t off the water for a year should create a clearer ecological signal, so less time is needed to detect change.

Higher social-economic stakes – one year limits disruption for the purse-seine operator (mostly Pelco NZ) while still generating robust data.

Complementary, not conflicting – running a one-year JMA 1 trial alongside the three-year small-forage closure lets managers distinguish size-class effects on predators.

Additional comments

Minor recreational and customary allowances should also be suspended during the experimental period to preserve interpretability.

Conclusion

Fisheries New Zealand's consultation options adjust the numbers but leave fishing pressure all but unchanged, so they cannot rebuild forage-fish biomass or test ecosystem responses. Management Action 1.3.2 of the Hauraki Gulf Fisheries Plan calls for *"measures to prevent adverse effects on the food-web from the harvest of forage species"*; the only option that squarely meets that brief is a short, carefully monitored closure. By pausing take, measuring predator and prey trends, then recalibrating limits with real data, the Minister would move from

[14] https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-conservation-services/reports/201920-annual-plan/pop-2019-02-fish-shoal-dynamics-north-eastern-new-zealand.pdf

[15] https://www.researchgate.net/publication/250020451_Feeding_behaviours_of_short-beaked_common_dolphins_Delphinus_delphis_in_New_Zealand

static quota-tweaks to the practical, science-rich pathway that true ecosystem-based fisheries management demands.

Thank you for considering our submission.

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APENDIX

Forage fish landing charts

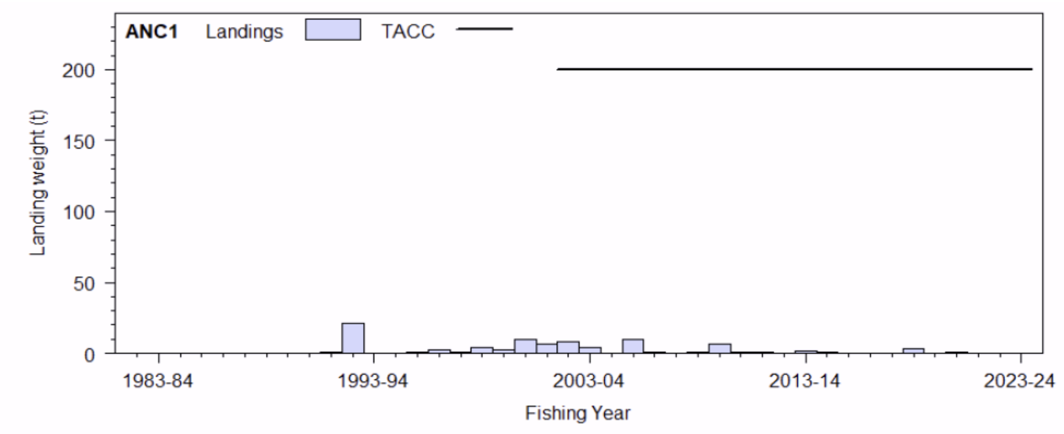
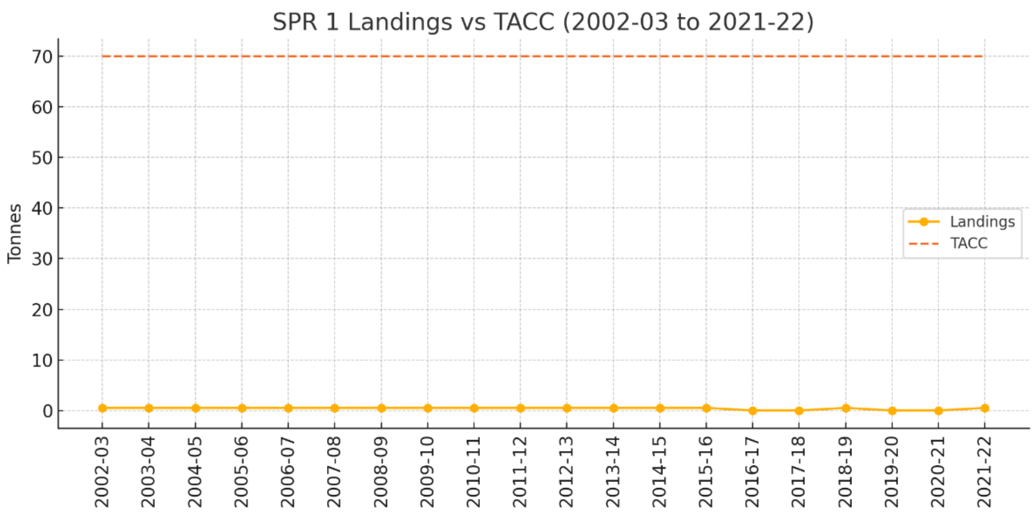


Figure 2. Historical landings of anchovy in ANC 1 from 1990/91 and 2023/24. Note: No information on catches or landings exist prior to 1990. The black line represents the total allowable commercial catch for ANC 1.



Note no landing chart was supplied for SPR 1, data retrieved from https://www.mpi.govt.nz/dmsdocument/57697/direct/

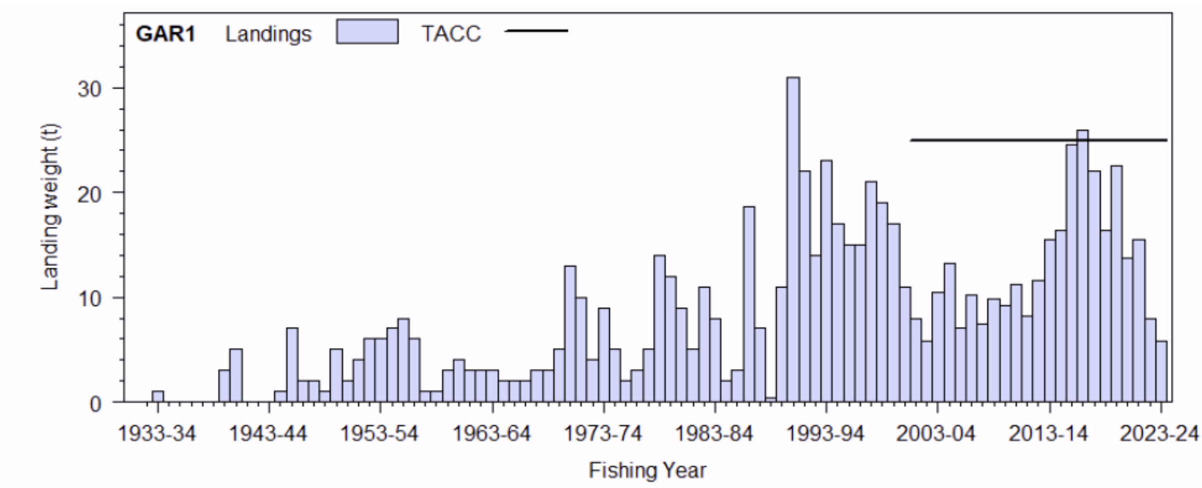


Figure 3. Historical landings of garfish in GAR 1. The black line represents the total allowable commercial catch for GAR 1.

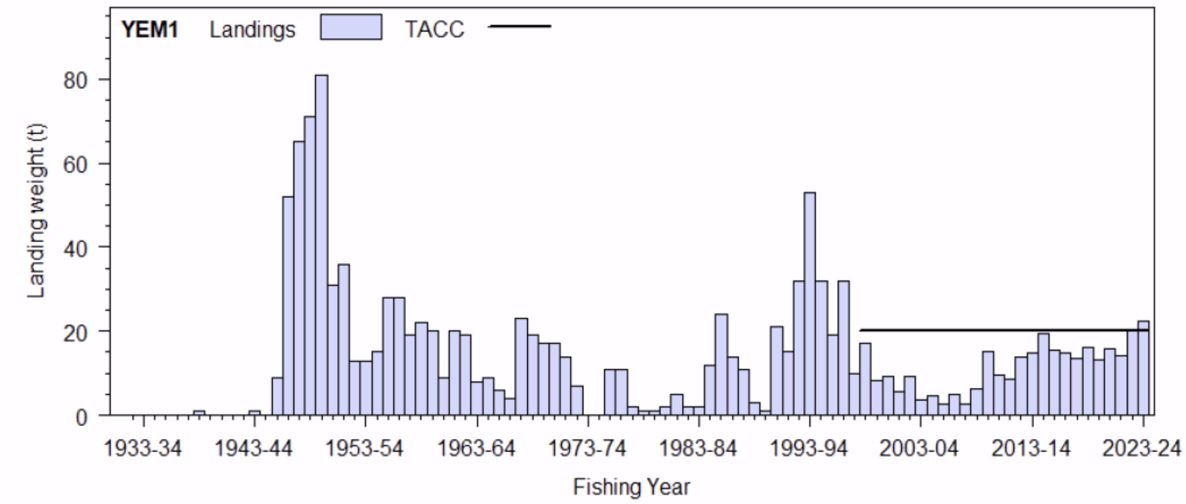


Figure 4. Reported landings of yellow-eyed mullet in YEM 1 from 1938/39 to 2023/24. The black line represents the YEM 1 total allowable commercial catch.

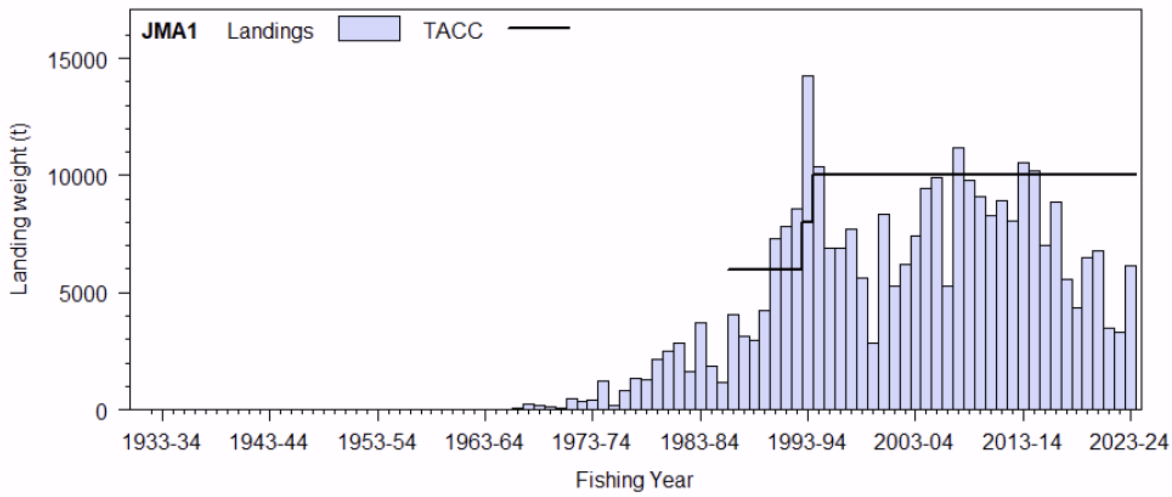


Figure 2: Reported commercial landings and TACC for JMA 1.

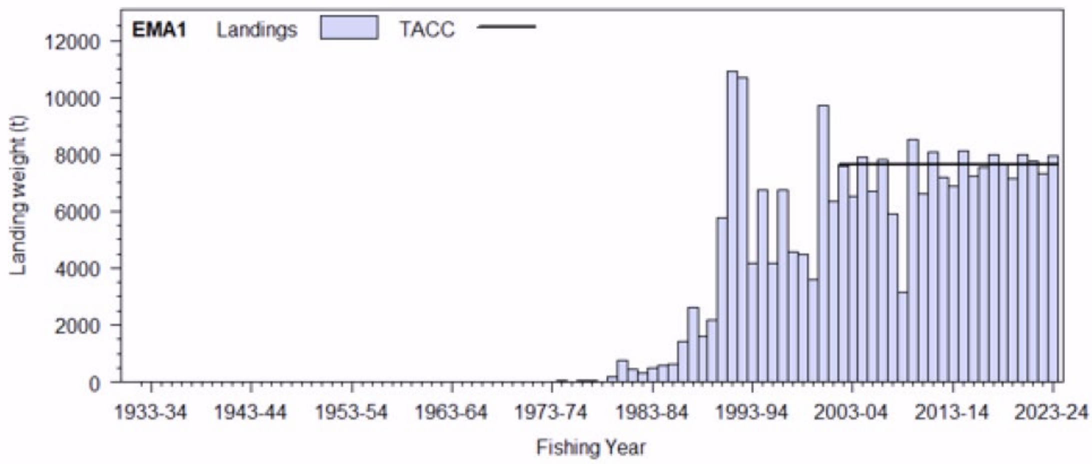


Figure 2: Reported commercial landings and TACC for EMA 1.