

Eastern Sea Garfish (2023)

Hyporhamphus australis



John Stewart: New South Wales Department of Primary Industries

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
New South Wales	Eastern Australia	Sustainable	Spawning stock biomass, fishing mortality rate, age composition, catch, effort

STOCK STRUCTURE

Eastern Sea Garfish (*Hyporhamphus australis*) is found in sheltered bays, coastal waters, and occasionally in the lower reaches of estuaries from Moreton Bay in Queensland to Eden in New South Wales, including Lord Howe and Norfolk Islands. Eastern Sea Garfish is considered a single biological stock. Genetic analyses indicated that Eastern Sea Garfish sampled from major ports in NSW were not significantly different, except for Eden on the far south coast that contained potential hybrids with the Southern Sea Garfish (*Hyporhamphus melanochir*) [Riley et al. 2023]. The Eastern and Southern Sea Garfish were confirmed to be genetically similar but distinct species. A single genetic stock confirms the previous assumption based on the species reasonably limited distribution along eastern Australia and the complex but southerly flowing Eastern Australian Current [Stewart et al. 2005].

Here, the stock status of Eastern Sea Garfish is reported at the biological stock level—Eastern Australia.

STOCK STATUS

Eastern Australia

The fishery for Eastern Sea Garfish is part of the NSW Ocean Hauling Fishery and uses garfish hauling nets to target schools of fish. These garfish hauling nets are designed to fish the surface layers and can be used either from boats or the shore; however most fishers are currently boat-based. The fishery is seasonal, most catches being taken between December and May on the south coast and between March and June on the north coast of NSW.

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The NSW Ocean Hauling Sea Garfish Fishery transitioned to quota management in 2017–18, with an interim annual catch quota of 45.5 tonnes (t) allocated until 2024. The most recent assessment of Eastern Sea Garfish [Broadhurst et al. 2018; Stewart 2023] estimated that biomass and recruitment levels have increased considerably (approximately tripled) since the stock was assessed as being overfished during the early 2000s [Stewart et al. 2015]. Biomass has stabilized since around 2013–14, averaging approximately 200 t, and in 2021–22 was estimated to be 190 t (95% CI 160 to 230 t) [Stewart 2023]. Recruitment of Eastern Sea Garfish is variable, with peaks evident in 2009–10, 2013–14 and 2017–18 [Stewart 2023]. Variable recruitment is believed to be a natural phenomenon in the Hemiramphidae; however, it may be exacerbated by the stock continuing to rebuild from its previously depleted state. Nominal catch rates in the boat-based fishery have steadily increased since 2016–17 [Stewart 2023]. Size and age compositions have been consistent, noting the variable year class strength observed. These indices suggest that the biomass is not depleted to a level that will inhibit recruitment. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Harvest in 2021–22 was reported to be 19.8 t, being approximately 15% of the estimated spawning stock biomass in that year (130 t) and considered a sustainable harvest fraction based on similar small-pelagic species [Stewart 2023; Smith et al. 2015]. Kienzle et al. [2021] estimated the maximum sustainable yield (MSY) for Eastern Sea Garfish was 78 t per year and could be achieved with a constant fishing effort of 700 boat-days annually. The spawning stock biomass that generates MSY was estimated at 62 t. Total catch and targeted fishing effort have been well below these estimates since 2010–11 [Stewart 2023]. The minimum mesh size in garfish hauling nets was increased to 28 mm during the mid-2000s, reducing fishing mortality on juveniles considerably [Broadhurst et al. 2018]. Fishing mortality dropped below the estimated natural mortality level in 2009–10 and has remained there since, with fishing mortality on juveniles (age-group 0) very low [Stewart 2023]. The above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

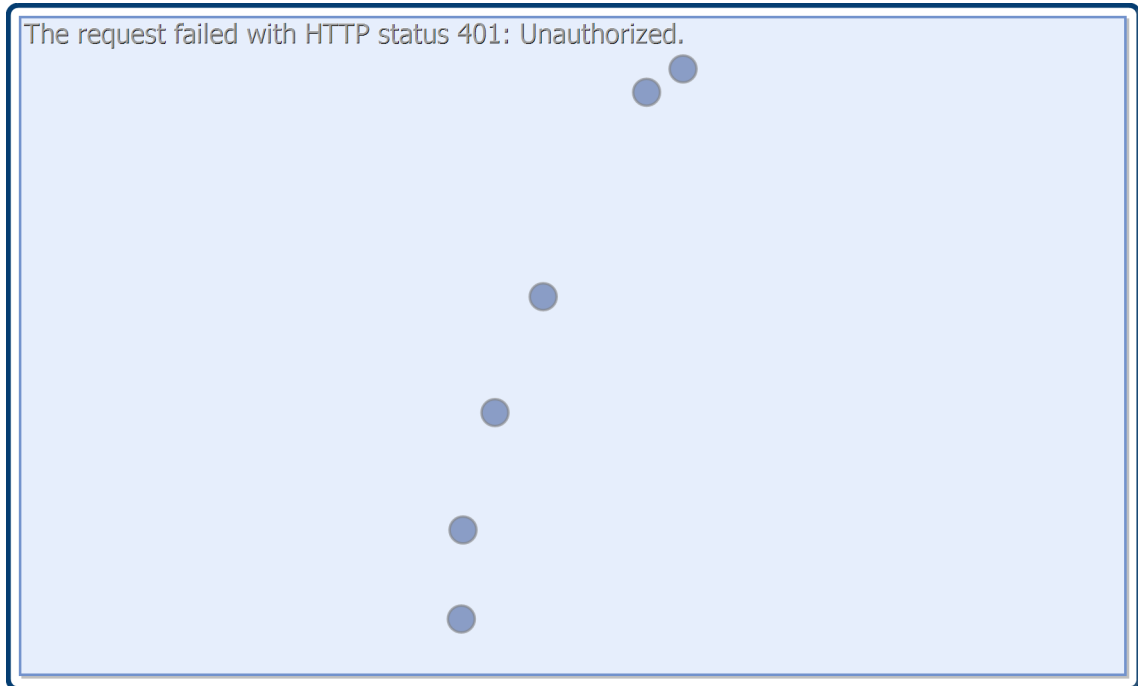
On the basis of the evidence provided above, the biological stock is classified as a **sustainable stock**.

BIOLOGY

Eastern Sea Garfish biology [Collette 1974; Hughes and Stewart 2006; Broadhurst et al. 2018]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Eastern Sea Garfish	6 years, 398 mm FL	210 mm FL, 1 year

DISTRIBUTION



Distribution of reported commercial catch of Eastern Sea Garfish

TABLES

Fishing methods	
	New South Wales
Charter	
Hook and Line	✓
Commercial	
Haul Seine	✓
Various	✓
Recreational	
Hook and Line	✓

Management Methods	
	New South Wales
Charter	
Bag and possession limits	✓
Bag limits	✓
Gear restrictions	✓

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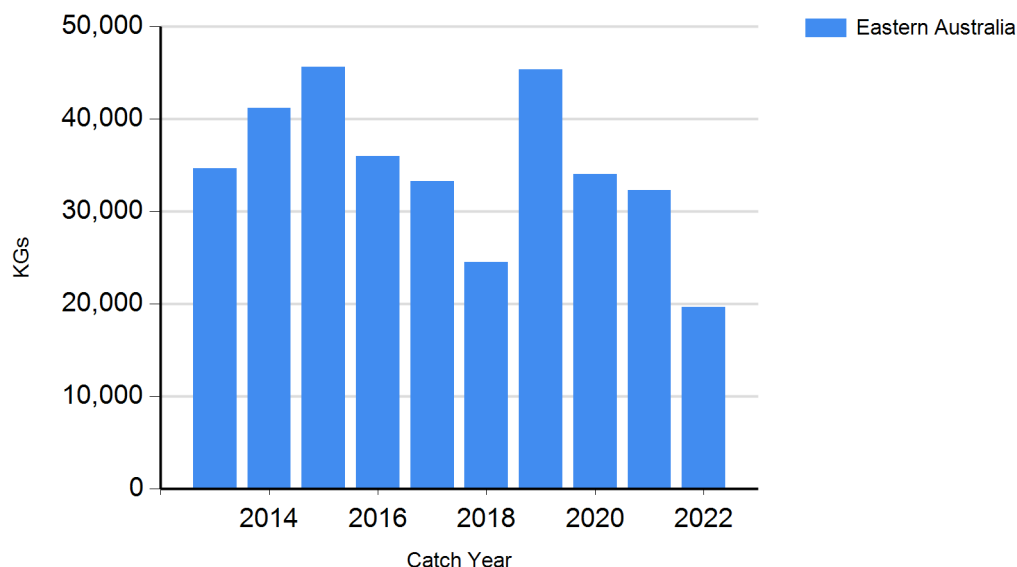
Licence	✓
Marine park closures	✓
Spatial closures	✓
Commercial	
Gear restrictions	✓
Marine park closures	✓
Mesh size regulations	✓
Quota	✓
Spatial closures	✓
Vessel restrictions	✓
Recreational	
Bag and possession limits	✓
Bag limits	✓
Gear restrictions	✓
Licence	✓
Marine park closures	✓
Spatial closures	✓

Catch	New South Wales
Charter	None
Commercial	19.6291 t
Indigenous	Unknown
Recreational	11,500 fish - all garfish species (2019-20)

New South Wales – Recreational. (Catch) Murphy et al. [2022].

New South Wales – Indigenous (management methods). <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

CATCH CHART



Commercial catch of Eastern Sea Garfish

References	
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Hughes and Stewart 2006	Hughes, JM and Stewart, J 2006, Reproductive biology of three commercially important Hemiramphid species in south-eastern Australia, Environmental Biology of Fishes, 75: 237–256.
Stewart 2023	Stewart, J 2023, NSW Stock Status Summary 2021/22 – Eastern Sea Garfish (<i>Hyporhamphus australis</i>), NSW Department of Primary Industries, Fisheries NSW, 10 pp.
Smith et al. 2015	Smith, A, Ward, T, Hurtado, F, Klaer, N, Fulton, E and Punt, A 2015, Review and update of harvest strategy settings for the Commonwealth Small Pelagic Fishery: single species and ecosystem considerations, report for FRDC project 2013/028, CSIRO Oceans and Atmosphere Flagship, Hobart.
Stewart et al. 2005	Stewart, J, Hughes, JM, Gray, CA and Walsh, C 2005, Life history, reproductive biology, habitat use and fishery status of eastern sea garfish (<i>Hyporhamphus australis</i>) and river garfish (<i>H. regularis ardelio</i>) in NSW waters, NSW Department of Primary Industries Fisheries Final Report Series 73, 180 pp, ISSN 1449–9967.
Stewart et al. 2015	Stewart, J, Hegarty, A, Young, C, Fowler, AM and Craig, J 2015, Status of fisheries resources in NSW 2013–14, NSW Department of Primary Industries, Mosman, 391 pp.
Murphy et al. 2022	Murphy, JJ, Ochwada-Doyle, FA, West, LD, Stark, KE, Hughes, JM, Taylor, MD 2022, Survey of recreational fishing in NSW, 2019/20 – Key Results, NSW DPI – Fisheries Final Report Series No. 161. ISSN 2204-8669.

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Kienzle et al. 2021	Kienzle, M, Broadhurst, MK., Pletzer, A, Stewart, J 2021. A Bayesian approach to estimating mortality rates using hazard functions: Application to an Australian halfbeak, <i>Hyporhamphus australis</i> fishery. <i>Fisheries Research</i> , 243, p.106066.