

Bluespotted Flathead (2020)

Platycephalus caeruleopunctatus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
New South Wales	Eastern Australia	Sustainable	Catch, effort, standardised CPUE, length and age compositions, biomass depletion and harvest rate estimates

STOCK STRUCTURE

Bluespotted Flathead is distributed along eastern Australia between southern Queensland and eastern Victoria, inhabiting deep estuarine and ocean waters to depths of about 100 m. The stock structure of Bluespotted Flathead has not been formally investigated and remains unknown. However, a recent review of the species' taxonomy that examined specimens from along the New South Wales coast and Lakes Entrance, Victoria, identified no significant variation in morphological characters within the species [Imamura 2015]. Limited tagging data also suggest that, while some individuals show high site fidelity in estuarine habitats, other individuals cover large distances within a short period [Fetterplace et al. 2016], so some longshore mixing of populations is possible.

Here, assessment of stock status is presented at the biological stock level—Eastern Australia.

STOCK STATUS

Eastern Australia Commercial landings of Bluespotted Flathead in New South Wales are primarily (98 per cent) taken by fish and prawn trawlers in the Ocean Trawl Fishery (OTF) [Hall 2015]. Small quantities of commercial catch are also reported by the Estuary General Fishery (mostly using mesh nets) and Ocean Trap and Line Fishery (mostly using handlines). Annual commercial catches of Bluespotted Flathead in NSW state waters are available from 1947–48 to present [Hall 2020]. Early catches fluctuated considerably and then stabilised during the 1990s and 2000s at around 100–200 tonnes (t) per year. Over recent years, catches have decreased from 210 t in 2010–11 to an historical low of 95 t in 2014–15 and then increased again to 146.2 t in 2017–18 and 112.3 t in 2018–19 [Hall 2020; note 2018–19 data are incomplete]. Standardised catch rates for the fish trawl sector have been 5–41 per cent above the long-term (20 year) average of 61.1 kg per day for the last 10 years, but 2–28 per cent below the shorter-term (eight

year) average of 13.4 kg per hour for the last five years [Hall 2020]. The reliability of these indices as proxies for relative abundance is questionable because of the undue influence of catch reporting changes since July 2009.

The quantities of Bluespotted Flathead taken by fisheries in other jurisdictions are unknown, but assumed to be small. These are generally reported against an undifferentiated flathead group code or included with catches of another sympatric flathead species (e.g., Tiger Flathead, *Platycephalus richardsoni* in Commonwealth waters and Southern Bluespotted Flathead, *Platycephalus speculator* in Victorian waters).

Bluespotted Flathead is also a key species for recreational and charter boat fishers in New South Wales. The most recent estimate of the recreational harvest of Bluespotted Flathead (combined with other ocean sand flatheads) in NSW was approximately 281 844 fish or around 129 t during 2017–18 [Murphy et al. 2020]. This estimate was based on a survey of Recreational Fishing Licence (RFL) households, comprised of at least one fisher possessing a long-term (1 or 3 years duration) fishing licence and any other fishers resident within their household. The equivalent estimated recreational harvest in 2013–14 was 32.3 per cent larger at around 416 195 fish [Murphy et al. 2020]. Relative to the commercial catch, the estimated statewide harvest of 210 t in 2013–14 accounted for approximately 64.6 per cent of the total harvest of Bluespotted Flathead from NSW waters [Hall 2020]. Charter boat catches remained at less than 10 t in most years since data collection started in 2000–01, but recently increased to 15.6 t in 2016–17, possibly in response to improved reporting compliance. Statewide estimates of the annual Aboriginal harvest of Bluespotted Flathead in NSW waters are unknown.

Catch rates in the recreational sector (in number of fish per fisher day) are only available for combined flathead species, of which sand flatheads are likely to comprise approximately 93 per cent of the total catch from ocean waters. These data indicate that there was a slight increase in catch rates of ocean flathead between surveys done in 2001–01 and in 2013–14, from 1.1 to 1.3 fish per fisher day [West et al. 2015]. Nominal catch rates in the charter boat sector also show a slight increase over the last 15 years for which data are available [Hall 2020].

Results of modified Catch-MSY analyses [Martell and Froese 2013, Haddon et al. 2018] of 12 historical catch series comprised of different recreational fishing scenarios combined with reported commercial and charter boat catches and discard estimates, predicted that the biomass of Bluespotted Flathead in New South Wales waters had been heavily fished in the past, but had recovered to 32.6–34.2 per cent of the estimated maximum biomass in 2017, which is above the limit reference point of 20 per cent [Hall 2018]. Annual length frequencies of fish sampled from the commercial catch over a period spanning 45 years also indicate that the length structure of the population has remained stable [Hall 2020]. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The total number of active operators in the OTF has steadily declined from 171 in 1997–98 to 68 in 2018–19 [Hall 2020]. Reported effort in total days fished for Bluespotted Flathead by OTF fishers increased from 13 785 days in 1997–98 to a maximum of 15 946 days in 2002–03, before declining rapidly until 2009–10. Reported effort in 2019–18 was just 4 863 days, which represents 30.5 per cent of the amount of effort that was reported historically in 2002–03. The most recent statewide recreational survey in 2013–14, estimated that recreational fishing participation rates have also decreased by 30 per cent from over 1 million participants (16.6 per cent of population) in 2000–01 to 836 632 (11.7 per cent) in 2013–14 [West et al. 2015]. Concurrently, estimated fishing effort for all species combined decreased by 37 per cent from over 5 million fisher days (and 5.6 days per fisher) in 2000–01 to 3.2 million (and 4.3 days per fisher) in 2013–14.

Results of modified Catch-MSY analyses estimate that the harvest rate of all sectors on Bluespotted Flathead in New South Wales (0.054–0.088) has been below the limit reference point of FMSY (0.079–0.098) since 2014, irrespective of which historical catch series was analysed [Hall 2018]. Catch-curve analyses of numbers-at-age data supported this result, with fishing mortality approximately equal to an average estimate of natural mortality of $M=0.49$ [Hall 2020]. However, this latter result depends on the accuracy of the estimated value for M , which varied (0.45 and 0.65) depending on the method of empirical estimation used [modified Hoenig and Pauly equations, respectively, as recommended in Then et al. 2014]. 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 Eastern Australia biological stock of Bluespotted Flathead is classified as a **sustainable stock**.

BIOLOGY

Bluespotted Flathead biology [Barnes et al. 2011, Barnes 2012]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Bluespotted Flathead	9 years, 680 mm TL	Males: 1.0–1.1 years, 212–231 mm TL Females: 1.8–3.0 years, 272–354 mm TL

DISTRIBUTION



Distribution of reported commercial catch of Bluespotted Flathead

TABLES

Fishing methods	
	New South Wales
Charter	

Handline	✓
Commercial	
Trawl	✓
Recreational	
Handline	✓

Management Methods	
	New South Wales
Charter	
Bag and possession limits	✓
Gear restrictions	✓
Licence	✓
Marine park closures	✓
Size limits	✓
Commercial	
Effort limits	✓
Gear restrictions	✓
Limited entry	✓
Size limits	✓
Spatial closures	✓
Total allowable catch	✓
Vessel limits	✓
Recreational	
Bag and possession limits	✓
Gear restrictions	✓
Licence	✓
Marine park closures	✓
Size limits	✓

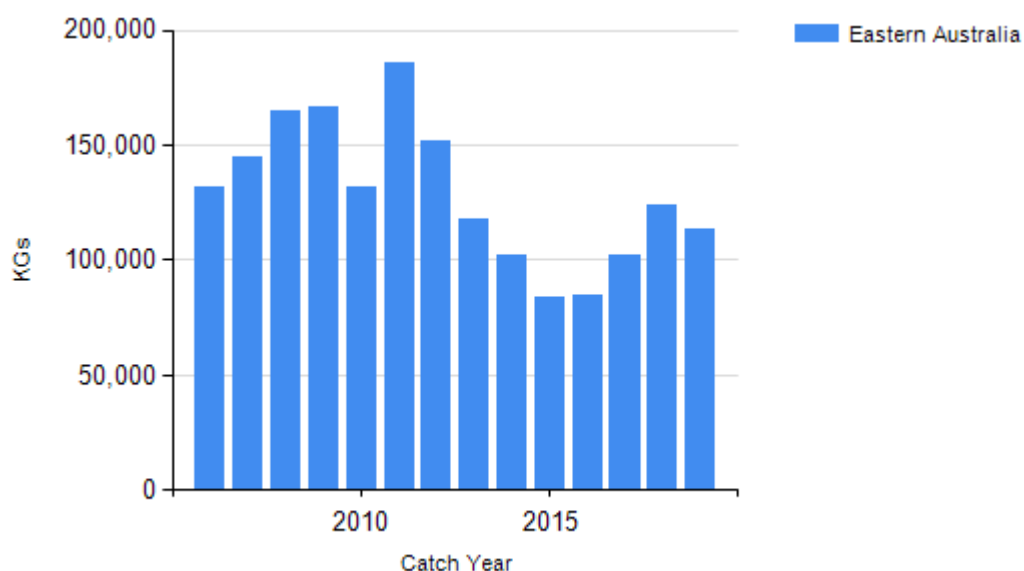
Catch	
	New South Wales
Charter	15.6 t (2016–17)

Commercial	113.314 t
Indigenous	Unknown
Recreational	129 t (2017–18)

New South Wales – Recreational (catch totals) Estimate from Murphy et al. [2020], based on a survey of Recreational Fishing Licence households.

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

CATCH CHART



Commercial catch of Bluespotted Flathead - note confidential catch not shown

References	
Barnes 2012	Barnes, LM 2012, Comparative assessment of the growth, reproductive biology and life history characteristics of coexisting coastal flathead (Platycephalidae). PhD Thesis. Macquarie University, Sydney
Barnes et al. 2011	Barnes, LM, Gray, CA and Williamson, JE 2011, Divergence of the growth characteristics and longevity of coexisting Platycephalidae (Pisces). <i>Marine and Freshwater Research</i> , 62: 1308–1317.
Fetterplace et al. 2016	Fetterplace, L, Davis, AR, Neilson, JM, Taylor, MD and Knott, NA 2016, Active acoustic tracking suggests that soft sediment fishes can show site attachment: a preliminary assessment of the movement patterns of the blue-spotted flathead (<i>Platycephalus caeruleopunctatus</i>). <i>Animal Biotelemetry</i> , 4(15): 1–11.
Haddon et al. 2018	Haddon, M, Punt, A and Burch, P 2018, simpleSA: A Package containing functions to facilitate relatively simple stock assessments. R package version 0.1.13.
Hall 2015	Hall, KC 2015, Bluespotted Flathead (<i>Platycephalus caeruleopunctatus</i>), In: Stewart, J, Hegarty, A, Young, C, Fowler, AM and Craig, J (eds), <i>Status of Fisheries Resources in NSW 2013–14</i> , NSW Department of Primary Industries, Mosman, pp 41–44.
Hall 2018	Hall, KC 2018, Stock status summary and stock assessment report 2018 – Ocean Trawl Fishery (Inshore Prawn, Offshore Prawn, Deepwater Prawn and Northern Fish Trawl) – Bluespotted Flathead (<i>Platycephalus caeruleopunctatus</i>), NSW Department of Primary Industries, Coffs Harbour.

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Imamura 2015	Imamura, H 2015. Taxonomic revision of the flathead fish genus <i>Platycephalus</i> Bloch, 1785 (Teleostei: Platycephalidae) from Australia, with description of a new species. <i>Zootaxa</i> , 3904: 151–207.
Martell and Froese 2013	Martell, S and Froese, R 2013. A simple method for estimating MSY from catch and resilience. <i>Fish and Fisheries</i> , 14: 504–514.
Then et al. 2014	Then, AY, Hoenig, JM, Hall, NG and Hewitt, DA 2014. Evaluating the predictive performance of empirical estimators of natural mortality rate using information on over 200 fish species. <i>ICES Journal of Marine Science</i> , 72: 82–92.
West et al. 2015	West, LD, Stark, KD, Murphy, JJ, Lyle, JM and Doyle, FA 2015. Survey of recreational fishing in New South Wales and the ACT, 2013/14. NSW Department of Primary Industries, Mosman, NSW, Australia.
Hall 2020	Hall, KC 2020, Stock status summary and stock assessment report 2019 – Ocean Trawl Fishery (Inshore Prawn, Offshore Prawn, Deepwater Prawn and Northern Fish Trawl) – Bluespotted Flathead (<i>Platycephalus caeruleopunctatus</i>), NSW Department of Primary Industries, Coffs Harbour.
Murphy et al. 2020	Murphy, JJ, Ochwada-Doyle, FA, West, LD, Stark, KE and Hughes, JM, 2020, The NSW Recreational Fisheries Monitoring Program - survey of recreational fishing, 2017/18. Fisheries Final Report Series No. 158.