

# Dusky Flathead (2016)

*Platycephalus fuscus*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Queensland	Queensland	ECIFFF	Sustainable	Commercial catch and CPUE, length and age, total instantaneous mortality rate (Z)
New South Wales	New South Wales	EGF	Undefined	Commercial catch and CPUE, length frequency
Victoria	Victoria	GLF	Sustainable	Commercial catch and CPUE

EGF Estuary General Fishery (NSW), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GLF Gippsland Lakes Fishery (VIC)

## STOCK STRUCTURE

The biological stock structure of Dusky Flathead populations is unknown.

In the absence of information on biological stock boundaries, here assessment of stock status is presented at the jurisdictional level—Queensland, New South Wales and Victoria[1–6].

## STOCK STATUS

**New South Wales** Commercial landings of Dusky Flathead in the Estuary General Fishery (EGF) over the past 3 years (109–125 tonnes [t]) were lower than the long-term annual average (152 t). As a result, median commercial nominal catch rates (nominal) for mesh netting were also 25 per cent lower between 2012–13 and 2014–15 than the previous 2 years[11]. Recreational harvest estimates decreased from 570–830 t in 2001–01 to 288 t in 2013–14, but this coincided with a decrease in effort, such that the recreational catch rates for all flathead species remained steady[12]. The size compositions of fish measured from the commercial catch until 2012–13 were similar to previous years, suggesting no substantial changes to the size frequency of the stock[11]. While some decline in biomass in New South Wales waters may have occurred, the evidence

indicates that the biomass of this stock is not considered to be recruitment overfished.

Summed across all mesh net methods in the EGF, annual nominal effort has been steady at around 15 000 fisher days over the past 5 years[11]. No current estimates of fishing and natural mortality are available for Dusky Flathead in New South Wales. There is insufficient information available to confidently classify the status of this stock.

On the basis of the evidence provided above, Dusky Flathead in New South Wales is classified as an **undefined stock**.

**Queensland** Nominal commercial catch rates have been stable since 1993[7]. Fishery-dependent monitoring from 2007–15 indicates that both the commercial and recreational fishery sectors are harvesting Dusky Flathead across a spread of lengths and ages[7]. Fishery-dependent monitoring of length and age indicate that Dusky Flathead populations have variable recruitment, with no evidence of a decline in recruitment or adult composition through time[7]. The evidence indicates that the biomass of this stock is not likely considered to be recruitment overfished.

In the commercial fishery, nominal effort increased slightly in 2015 compared to 2014 (3936 days fished in 2015; 3503 days fished in 2014) but remains lower than historic levels (5400 days fished in 2009)[7]. Recreational effort in areas where Dusky Flathead are common decreased between 2000–01 and 2010–11 and then remained stable between 2010–11 and 2013–14[8]. Commercial and recreational fishers predominantly harvest female fish because of the minimum and maximum size limits that are in place. The minimum size protects most male fish, and the maximum size protects large female fish[7]. A recent study in Queensland estimated between 10 and 20 per cent of the yearly egg production is likely to come from fish protected by the maximum size limit[9]. Possession limits are in place for the recreational sector and mouth hooked Dusky Flathead have high post-release survival[10]. Estimates of total mortality (from catch curves) are high (fishing mortality rate [ $F$ ] is fluctuating above and below the natural mortality rate [ $M$ ]) but show no clear trends upwards or downwards since 2007[6]. The estimates do not take into account older fish, which are known to exist in the population, but are protected by the upper size limits in place. The above evidence indicates that the current level of fishing pressure is unlikely to cause this stock to become recruitment overfished.

On the basis of the evidence provided above, Dusky Flathead in Queensland is classified as a **sustainable stock**.

**Victoria** Most Dusky Flathead caught in Victoria are taken from the Gippsland Lakes using mesh net, although they are also caught incidentally using other methods. The most recent assessment for Dusky Flathead in the Gippsland Lakes (the system where most Dusky Flathead are caught in Victoria) was undertaken in 2016[5]. Catches of Dusky Flathead reached a historical peak in 2006, when 53 t were harvested and then declined to 8 t in 2014[5,6]. In 2015, catches increased to 12 t, which is still double the size of commercial catches from 2000.

Commercial catch rates were greatest during 2005–06 (3.5 kg per km per hour), although catch rates have since declined[5], the 5-year average mesh net catch rate over 2014–15 of 1.12 kg per km per hour was above the long-term average of 0.83 kg per km per hour. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished; however, declining catch rates will be closely monitored in the future.

Available recreational catch data (2005, 2006, 2009, and 2010) indicate that

recreational fishers in the Gippsland Lakes rarely take Dusky Flathead larger than 500 mm total length (TL)[6]. In November 2013, Victoria introduced a slot limit for recreationally caught Dusky Flathead of 300–550 mm. The number of licensed commercial fishers in Victorian waters was reduced by two-thirds between 1986–87 and 2010–11. The majority of the licence removals occurred as a result of voluntary licence buyback schemes conducted in 1999–2000 and 2005–06.

A biological study of Dusky Flathead caught in Eastern Victoria estimated a potential annual fecundity of up to 4.8 million eggs (764 mm TL); and that the size of maturity for females was 328 mm ( $\pm$  24 mm standard error) which is slightly larger than the minimum size slot length for recreational fishers[13]. Hicks (2015) suggested that the management of Dusky Flathead could be based on maintaining spawning biomass rather than implementing size restrictions on recreational fishers. The slot limits are likely to be effective in maintaining trophy size fish and while protecting recruits up to spawning size.

The above evidence indicates that the current level of fishing pressure is unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, Dusky Flathead in Victoria is classified as a **sustainable stock**.

## BIOLOGY

Dusky Flathead biology[4,14]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Dusky Flathead	Females: 16 + years; 1 200 mm <u>TL</u> Males: 11+ years; 620 mm <u>TL</u>	Females: 570 mm <u>TL</u> Males: 320 mm <u>TL</u>

## DISTRIBUTION



Distribution of reported commercial catch of Dusky Flathead

TABLES

Commercial Catch Methods	New South Wales	Queensland	Victoria
Coastal, Estuary and River Set Nets	✓		
Haul Seine			✓
Line		✓	✓
Mesh Net	✓		✓
Net		✓	
Unspecified			✓

Fishing methods	New South Wales	Queensland	Victoria
<b>Commercial</b>			
Coastal, Estuary and River Set Nets	✓		
Haul Seine			✓
Line		✓	
Mesh Net	✓		✓
Net		✓	
<b>Recreational</b>			
Hand Line, Hand Reel or Powered Reels	✓	✓	✓
Spearfishing	✓	✓	

Management Methods	New South Wales	Queensland	Victoria
<b>Commercial</b>			
Fishing gear and method restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Size limit	✓	✓	✓
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	

Indigenous			
Bag limits	✓		
Fishing gear and method restrictions	✓		
Section 31 (1)(c1), Aboriginal cultural fishing authority	✓		
Size limit	✓		
Spatial closures	✓		
Recreational			
Bag limits	✓		✓
Fishing gear and method restrictions	✓	✓	✓
In possession limits	✓	✓	✓
Licence	✓		✓
Size limit	✓	✓	✓
Spatial closures	✓	✓	✓

Active Vessels			
	New South Wales	Queensland	Victoria
	276 Vessel in EGF,	205 Vessel in ECIFFF,	12 Vessel in GLF,

EGF Estuary General Fishery(NSW)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GLF Gippsland Lakes Fishery(VIC)

Catch			
	New South Wales	Queensland	Victoria
Commercial	110.697t in EGF,	49.6193t in ECIFFF,	12.499t in GLF,
Indigenous	Unknown	Unknown	Unknown
Recreational	288 t (2013–14)	93 t (2013–14)	Unknown

EGF Estuary General Fishery (NSW), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GLF Gippsland Lakes Fishery (VIC),

**a Queensland - Indigenous** In Queensland, under the Fisheries Act 1994 (Qld), Indigenous fishers are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and bag limits and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations can be obtained through permits.

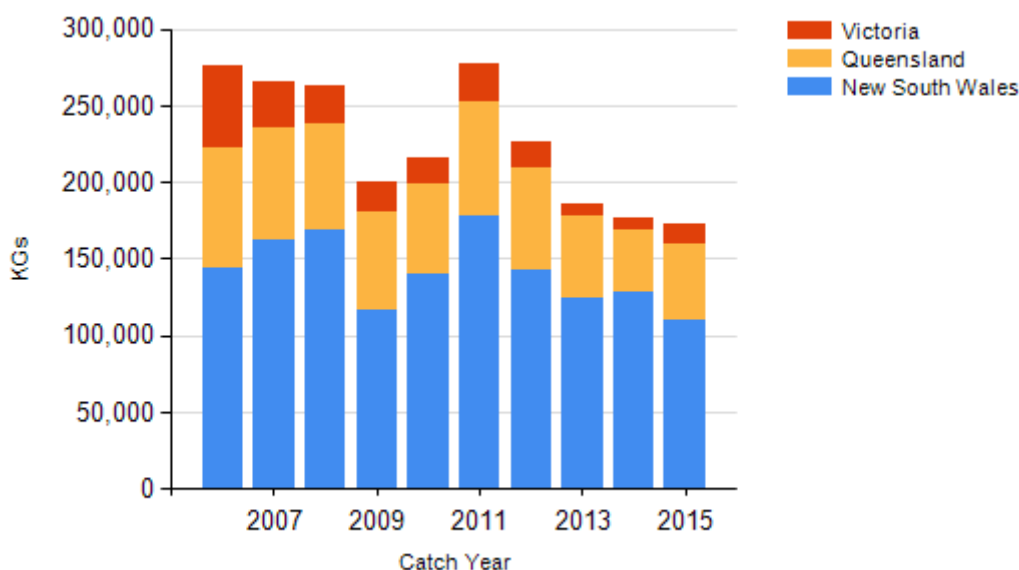
**b New South Wales - Indigenous** Aboriginal Cultural Fishing Interim Access Arrangement - allows an Indigenous fisher in New South Wales to take in excess of a recreational bag limit in certain circumstances, for example, if they are doing so to provide fish to other community members who cannot harvest themselves.

**c Victoria - Indigenous** Aboriginal cultural fishing authority - the authority that Indigenous persons can apply to take catches outside the recreational limits under the Fisheries Management Act 1994 (NSW), Section 37(1)(c1), Aboriginal cultural fishing authority.

**d Victoria - Indigenous** In Victoria, regulations for managing recreational fishing are also applied to fishing activities by Indigenous people. Recognised Traditional Owners (groups that hold native title or have agreements under the Traditional Owner Settlement Act 2010 [Vic]) are exempt (subject to conditions) from the requirement to hold a recreational fishing licence, and can apply for permits under the Fisheries Act 1995 (Vic) that authorise customary fishing (for example, different catch and size limits or equipment). The Indigenous category in Table 3 refers to customary fishing undertaken by recognised Traditional Owners. In 2015, there were no applications for customary fishing permits to access Dusky Flathead.

**e Victoria - Indigenous** Subject to the defence that applies under Section 211 of the Native Title Act 1993 (Cth), and the exemption from a requirement to hold a Victorian recreational fishing licence, the non-commercial take by indigenous fishers is covered by the same arrangements as that for recreational fishing.

## CATCH CHART



Commercial catch of Dusky Flathead - note confidential catch not shown

## EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- In Queensland, coastal, river and estuary set gillnets have been shown to have minimal impact on the environment and are quite selective in their harvest[15]. Levels of bycatch are generally low when compared to the harvest of the target species[15]. Fishers using tunnel nets operate under an industry developed code of best practice guidelines[16]. Marine turtles are released with minimal difficulty, and a very high proportion of undersized or unwanted catch is returned to the water alive.
- In New South Wales estuaries, Dusky Flathead are targeted using mesh nets, which also catch other species, including undersized individuals targeted in other key fisheries[17–21]. These impacts can be minimised by using specifically designed Dusky Flathead mesh nets that target fish above the minimum legal size[20].
- In a similar manner to the tunnel net fishery in Queensland, the New South Wales estuarine beach seine fishery operates in a manner that allows a proportion of non-target species to be released alive[22].
- The Victorian Bays and Inlets commercial fishers have adopted responsible fishing

- practices[23]. It is likely that fishing activities have minimal impact on the environment.
- Seabirds and other marine life often become entangled in discarded recreational fishing tackle[24]. In south-east Queensland, a Fishing Line Recovery Bin program was instigated in 2012 in order to minimise the occurrence of discarded tackle at popular shore based fishing locations.

#### ENVIRONMENTAL EFFECTS on Dusky Flathead

- Dusky Flathead are dependent on estuarine and inshore coastal habitats throughout their life cycle. Variable recruitment has been observed in all three states, and is thought to be environmentally driven[5].
- Physical impacts on coastal marine vegetation, sub-surface topography and water quality are likely to influence the resilience and productivity of Dusky Flathead populations at local scales.

References	
1	Hoyle, S, Brown, I, Dichmont, C, Sellin, M, Cosgrove, M, and McLennan, M 2000, <i>Integrated Fish Stock Assessment and Monitoring Program</i> , Fisheries Research and Development Corporation project 94/161, Queensland Department of Primary Industries, Brisbane.
2	O'Neill, MF 2000, <i>Fishery assessment of the Burnett River, Maroochy River and Pumistone Passage</i> , project report QO99012, Queensland Department of Primary Industries, Brisbane.
3	Gray, CA, Gale, VJ, Stringfellow, SL and Raines, LP 2002, Variations in sex, length and age compositions of commercial catches of <i>Platycephalus fuscus</i> (Pisces: Platycephalidae) in New South Wales, Australia, <i>Marine and Freshwater Research</i> , 53: 1091–1100.
4	Gray, CA and Barnes, LM 2008, <i>Reproduction and growth of dusky flathead in NSW estuaries</i> , Fisheries final report series no. 101, NSW Department of Primary Industries, Cronulla.
5	Conron S., Giri K, Hamer P and Hall K 2016, Gippsland Lakes Fishery Assessment 2016. Fisheries Victoria Science Report Series No. 14
6	Kemp, J, Bruce, T, Conron, S, Bridge, N, MacDonald, M and Brown, L 2013, <i>Gippsland Lakes (non-breem) fishery assessment 2011</i> , Fisheries Victoria assessment report series no. 67, Fisheries Victoria, Victoria.
7	Department of Agriculture and Fisheries 2016, Queensland Stock Status Assessment Workshop 2016, 13-14 June 2016, Brisbane, Queensland Department of Agriculture and Fisheries.
8	Webley, J, McInnes, K, Tiexiera, D, Lawson, A and Quinn R 2015, <i>Statewide Recreational Fishing Survey 2013-14</i> , Department of Agriculture and Fisheries, Queensland.
9	Pollock, BR 2015, The annual spawning aggregation of Dusky Flathead <i>Platycephalus fuscus</i> at Jumpinpin, Queensland. Proceedings of the Royal Society of Queensland.
10	Butcher, PA, Broadhurst, MK and Cairns, SC 2008, Mortality and physical damage of angled and released dusky flathead <i>Platycephalus fuscus</i> , <i>Diseases of Aquatic Organisms</i> , 81: 127–134.
11	Hall, KC 2015, Dusky Flathead ( <i>Platycephalus fuscus</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 87–91.
12	West, LD, Stark, KE, Murphy, JJ, Lyle JM and Doyle, FA 2015, Survey of recreational fishing in New South Wales and the ACT, 2013/14. Fisheries Final Report Series.
13	Hicks T, Kopf RK, Humphries P 2015, Fecundity and egg quality of dusky flathead ( <i>Platycephalus fuscus</i> ) in East Gippsland, Victoria. Institute for Land Water and Society, Charles Sturt University. Report number 94. Prepared for the Recreational Fishing Grants Program, Fisheries Victoria. The State of Victoria Department of Economic Development, Jobs, Transport and Resources. Pp. 1-34. ISBN 978-1-86-467279-4.
14	Kailola, PJ, Williams, MJ, Stewart, PC, Reichelt, RE, McNee, A and Grieve, C 1993, <i>Australian Fisheries Resources</i> , Bureau of Rural Resources and the Fisheries Research and Development Corporation, Canberra, Australia.
15	Halliday, IA, Ley, JA, Tobin, A, Garrett, R, Gribble, NA and Mayer, DG 2001, <i>The effects of net fishing: addressing biodiversity and bycatch issues in Queensland inshore waters</i> , Fisheries Research and Development Corporation project 97/206, Department of Primary Industries, Queensland.
16	Moreton Bay Seafood Industry Association 2012, Moreton Bay tunnel net fishery code of best practice.
17	Gray, CA, Broadhurst, MK, Johnson, DD and Young, DJ 2002, Management implications of discarding in an estuarine multi-species gill net fishery, <i>Fisheries Research</i> , 56: 177–192.

STATUS OF AUSTRALIAN FISH STOCKS REPORT  
Dusky Flathead (2016)

18	Broadhurst, MK, Gray, CA, Young, DJ, and Johnson, DD 2003, Relative efficiency and size selectivity of bottom-set gill-nets for dusky flathead, <i>Platycephalus fuscus</i> and other species in New South Wales, Australia, <i>Fishery and Marine Research</i> , 50: 289–302.
19	Gray, CA, Johnson, DD, Young, J and Broadhurst, MK 2004, Discards from the commercial gillnet fishery for dusky flathead, <i>Platycephalus fuscus</i> , in New South Wales, Australia: spatial variability and initial effects of change in minimum legal length of target species, <i>Fisheries Management and Ecology</i> , 11: 323–333.
20	Gray, CA, Broadhurst, MK, Johnson, DD and Young, DJ 2005, Influences of hanging ratio, fishing height, twine diameter and material of bottom-set gillnets on catches of dusky flathead <i>Platycephalus fuscus</i> and non-target species in New South Wales, Australia, <i>Fisheries Science</i> , 71: 1217–1228.
21	Gray, CA, Johnson, DD, Broadhurst, MK and Young, DJ 2005, Seasonal, spatial and gear-related influences on relationships between retained and discarded catches in a multi-species gillnet fishery, <i>Fisheries Research</i> , 75: 56–72.
22	Gray, CA and Kennelly, SJ 2003, Catch characteristics of the commercial beach-seine fisheries in two Australian barrier estuaries, <i>Fisheries Research</i> , 63: 405–422.
23	Victorian Bays And Inlets Fisheries Association 2013, Environmental Management System Victorian Bays And Inlets Fisheries Association, Victoria.
24	Campbell, M 2013, <i>Reducing the impact of discarded recreational fishing tackle on coastal seabirds</i> , Fisheries Research and Development Corporation project 2011/057, Queensland Department of Agriculture Fisheries and Forestry, Brisbane.