

# Dusky Flathead (2018)

*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, N/A	Sustainable	Commercial catch and CPUE, length frequency
Victoria	Victoria	GLF	Sustainable	Commercial catch and CPUE, angler diary catch rates and length frequency

EGF Estuary General Fishery (NSW), N/A Not Applicable (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.

## STOCK STATUS

**New South Wales** In New South Wales during the past decade, commercial catches of Dusky Flathead have fluctuated at between 116 t and 178 t per year, and with more than 95 per cent of the total catch is caught using mesh nets. During the past five years, catches were initially consistent at 125 t, but peaked at 160 t in 2016, and declined to 116 t in 2017. The latter reduction was associated with substantially reduced effort, and the nominal catch rate by mesh netters has slightly increased during the past five years [Department of Primary Industries 2018]. Further, the size compositions of Dusky Flathead measured from commercial catches in 2017 were similar to annual estimates during the preceding decade, suggesting broad temporal consistency in the size composition of the stock [Department of Primary Industries 2018]. The total recreational harvest was estimated at 505 t in 2000–01 [Henry and Lyle 2003],

and then substantially less at 288 t in 2013–14 [West et al. 2015], but with some reduction in effort and high uncertainty owing to different sampling methods. In addition to these retained catches, large numbers (up to 55 per cent of the total catches) of Dusky Flathead were released at each period (minimum legal size is 360 mm TL, and fishers are allowed only one individual > 700 mm TL within a total daily bag limit of 10 fish). The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

There are no current estimates of fishing or natural mortality for Dusky Flathead in New South Wales, but it is well established that the species has very high short-term survival after being released by anglers [91 per cent; Butcher et al. 2008]. While their survival after discarding by mesh netters is much less [23 per cent; Broadhurst et al. 2009], in the last decade, mandated changes to mesh-net configurations, including increases in mesh size [Broadhurst et al. 2003, 2009; Gray et al. 2005] have improved selectivity, and therefore reduced discard mortality. Escape mortalities remain unknown, but these are presumed to be minimal [Uhlmann and Broadhurst 2015]. Consequently, fishing mortality on undersize Dusky Flathead (360 mm TL) in New South Wales is likely to be quite low. The above evidence indicates that the currently level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

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

**Queensland** There has been no distinct trend upwards or downwards in the nominal catch rate of the net fishery since contemporary logbook records began in the late 1980s (16 kg per day in 1993, 1994 and 1999 to 11.5 kg per day in 2009–10) [QDAF 2018]. Changes to the catch rate upon the introduction of maximum (700 mm TL) and minimum (400 mm TL) size limits in 2002 are apparent (average of 14.5 kg per day 1988–2001 to 12.5 kg per day 2002–17) but remain within the upper and lower bounds of the contemporary dataset [QDAF 2018]. The average total annual catch from the contemporary fisheries data series for 1988–2001 was 55 tonnes (t), and for 2002–17 it was 52 t, whilst the historical average total annual catch for 1945–80 was 73 t. These data may indicate some depletion has occurred, but they are confounded by changes to management and the lack of effort data for the historical time series [QDAF 2018]. They also may reflect periods of higher and lower recruitment. Fishery-dependent monitoring from 2007–15 indicates that both the commercial and recreational fishery sectors are harvesting Dusky Flathead across various lengths. The size-frequency distributions are very similar among years [QDAF 2018]. Fishery-dependent monitoring indicates very little change in age frequency since 2007 (modal age group of three, with only 2009 and 2011 showing differences with a modal age group of four) [QDAF 2018]. The evidence indicates the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

In the commercial net fishery, nominal effort was at an historic low for 2017 (3 267 boat days). This represents a 40 per cent decrease in days fished compared to 2007 (5 490 days fished); largely a result of Queensland Government buy backs and structural adjustment packages [QDAF 2018]. Recreational effort in areas where Dusky Flathead are common decreased between 2001 and 2014 (176 800 days fished in 2001, 151 000 days fished in 2011, 111 800 days fished in 2014) [Webley et al. 2015]. There is no estimate of Indigenous harvest or fishing effort for fishers using traditional fishing methods.

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 fish [QDAF 2018]. 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 [Pollock 2015]. Possession limits are in place for the recreational sector and

mouth-hooked Dusky Flathead have high post-release survival [Butcher et al. 2008]. Commercial fishers using tunnel nets operate under an industry developed code of best practice guidelines, and released fish have a high rate of survival [Moreton Bay Industry Association 2012].

Estimates of total mortality (from catch curves) are high (fishing mortality rate [F] is fluctuating above and below the natural mortality rate [M] [Then et al. 2014]) but have not shown a clear trend upwards or downwards since 2007 [QDAF 2018]. 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 impaired.

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

## Victoria

Most of the Victorian commercial Dusky Flathead catch is taken from the Gippsland Lakes using mesh nets, although they are also caught incidentally using other methods. Commercial catch from the Gippsland Lakes Fishery since 2010 has ranged from about 8 t to 25 t, increasing in recent years from 7.5 t in 2014, to 15 t to 16 t in 2016 and 2017. This is compared to historical peak harvests of approximately 65 t in 1986 and 53 t in 2006 [Conron et al. 2016, Kemp et al. 2013].

Commercial catch and catch rates of Dusky Flathead in the Gippsland Lakes are highly variable over time, reflecting the influence of naturally variable recruitment. The most recent peak in mesh net catch rates occurred in 2005–06. Apart from a smaller peak in catch rates in 2010–11, catch rates have declined over the last decade, and in 2016–17 were at approximately 20 per cent of the 2005–06 peak [Conron et al. 2016, VFA, unpublished data]. Similar declines have been observed for diary angler catch rates in recreational only estuaries in eastern Victoria, namely: Lake Tyers and Mallacoota Inlet [Ingram et al. 2016, VFA, unpublished data]. Diary angler catch rates in Mallacoota Inlet have declined over the last decade, and similar to the Gippsland Lakes, are now at approximately 20 per cent of the most recent peak in 2006–07 [Ingram et al. 2016, VFA, unpublished data]. In all three estuaries discussed above, recent catch rates are similar to those observed in the early 2000s, and it is likely that a regionally strong recruitment event was responsible for the higher catch rates observed during the mid-2000s. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

In 2013, recreational fishing regulations were tightened to create a slot limit for retained Dusky Flathead of 300–550 mm TL, while maintaining the daily per person bag limit of five fish. The slot and bag limits were designed to protect larger female and trophy size fish along with recruits up to spawning size, and to limit the overall recreational take. No recent information on recreational catch or fishing mortality is available for eastern Victorian populations. Commercial fishing effort on Dusky Flathead in Victoria has reduced substantially since the early 2000's. Licence buy back schemes removed all commercial fishing from Mallacoota Inlet and Lake Tyers and reduced the number of licences in the Gippsland Lakes fishery from 27 in 1999–2000 to 10 in 2006–07. Since 2006–07 total commercial effort (fisher days) in the Gippsland Lakes fishery has been stable at levels that are approximately 30 per cent of the peak levels observed in the early 1990s [Conron et al. 2016].

While catch rates have declined over the last decade, they have stabilised since 2013 and current levels are within historic variation and similar to those in the early 2000s, immediately prior to the mid-2000s peak. Commercial catches in the Gippsland Lakes fishery are also low relative to the historical peaks due to lower effort. The recent declines have been consistent across the three major estuaries in eastern Victoria (Mallacoota Inlet, Lake Tyers and Gippsland Lakes),

despite varying levels of fishing pressure, suggesting that environmental influences on recruitment have been the main driver of the recent declines. The above evidence suggests 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, Dusky Flathead in Victoria is classified as a **sustainable stock**.

**BIOLOGY**

**Dusky Flathead biology** [Gray and Barnes 2008, Hicks et al. 2015, Kailola et al. 1993]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Dusky Flathead	Females ≥ 16 years, 1 200 mm TL Males ≥ 11 years, 620 mm TL	Females 570 mm TL Males 320 mm TL

**DISTRIBUTION**



Distribution of reported commercial catch of Dusky Flathead

**TABLES**

Commercial Catch Methods	New South Wales	Queensland	Victoria
Hook and Line		✓	✓
Mesh Net	✓		
Net		✓	✓
Traps and Pots			✓
Unspecified	✓		✓

Fishing methods	New South Wales	Queensland	Victoria

<b>Charter</b>			
Hook and Line	✓	✓	✓
Spearfishing		✓	
<b>Commercial</b>			
Hook and Line		✓	
Mesh Net	✓		
Net		✓	✓
Unspecified	✓		
<b>Indigenous</b>			
Hook and Line	✓		
Spearfishing	✓		
Various		✓	
<b>Recreational</b>			
Hook and Line	✓	✓	✓
Spearfishing	✓	✓	
<b>Management Methods</b>			
	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
<b>Charter</b>			
Bag and possession limits		✓	
Fishing gear and method restrictions	✓		
Gear restrictions		✓	
In possession limits	✓		
Licence	✓		
Size limit	✓	✓	
Spatial closures	✓	✓	
<b>Commercial</b>			
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Size limit	✓	✓	✓
Spatial closures	✓	✓	✓
Temporal closures	✓	✓	
<b>Indigenous</b>			
Bag limits	✓		
Customary			✓

<b>fishing permits</b>			
<b>Native Title</b>	✓		
<b>Section 37 (1d)(3)(9), Aboriginal cultural fishing authority</b>	✓		
<b>Recreational</b>			
<b>Bag and possession limits</b>	✓	✓	
<b>Bag limits</b>	✓		✓
<b>Fishing gear and method restrictions</b>	✓		
<b>Gear restrictions</b>		✓	✓
<b>Licence</b>	✓		✓
<b>Size limit</b>	✓	✓	✓
<b>Spatial closures</b>	✓	✓	
<b>Active Vessels</b>			
	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
	258 Fishing Business in EGF,	183 in ECIFFF,	10 Licence Holders in GLF,

EGF Estuary General Fishery(NSW)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GLF Gippsland Lakes Fishery(VIC)

<b>Catch</b>			
	<b>New South Wales</b>	<b>Queensland</b>	<b>Victoria</b>
<b>Commercial</b>	131.68t in EGF, 3.091t in N/A,	39.88t in ECIFFF,	15.7869t in GLF,
<b>Indigenous</b>	Unknown	Unknown	Unknown (No catch under permit)
<b>Recreational</b>	288 t (2013–14)	93 t (2013–14)	Unknown

EGF Estuary General Fishery (NSW), N/A Not Applicable (NSW), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GLF Gippsland Lakes Fishery (VIC),

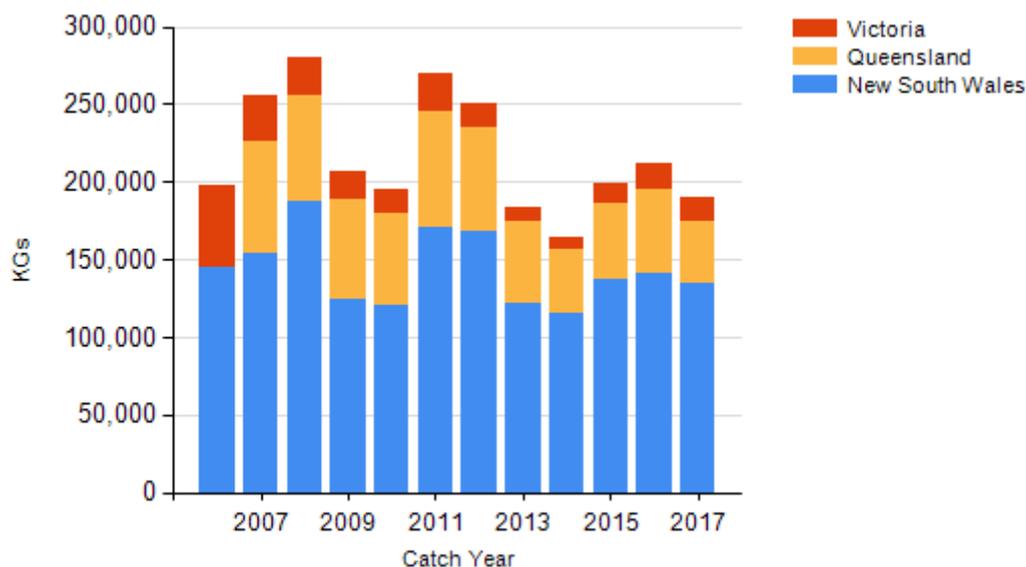
**Queensland – Indigenous (Management Methods).** In Queensland, under the *Fisheries Act 1994* (Qld), Indigenous fishers are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and bag limits and seasonal closures do not apply to Indigenous fishers.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

**New South Wales – Indigenous (Management Methods)** (a) The 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.; (b) The Aboriginal cultural fishing authority is the authority that Indigenous persons can apply to take catches outside the recreational limits under the *Fisheries Management Act 1994* (NSW), Section 37 (1d)(3)(9), Aboriginal cultural fishing authority; and (c) In cases where the *Native Title Act 1993* (Cth) applies fishing activity can be undertaken by the person holding native title in line with S.211 of that Act, which provides for fishing activities for the purpose of satisfying their personal, domestic or non-commercial communal needs. In managing the resource where native title has been formally recognised, the native title holders are engaged with to ensure their native title rights are respected and inform management of the State's fisheries resources.

**Victoria – Indigenous (Management Methods)** In Victoria, regulations for managing recreational fishing may not apply to fishing activities by Indigenous people. Victorian traditional owners may have rights under the *Commonwealth's Native Title Act 1993* to hunt, fish, gather and conduct other cultural activities for their personal, domestic or non-commercial communal needs without the need to obtain a licence. Traditional Owners that have agreements under the *Traditional Owner Settlement Act 2010* (Vic) may also be authorised to fish without the requirement to hold a recreational fishing licence. Outside of these arrangements, Indigenous Victorians can apply for permits under the *Fisheries Act 1995* (Vic) that authorise fishing for specific Indigenous cultural ceremonies or events (for example, different catch and size limits or equipment). There were no Indigenous permits granted in 2017 and hence no Indigenous catch recorded.

### CATCH CHART



Commercial catch of Dusky Flathead - note confidential catch not shown

### EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

#### ENVIRONMENTAL EFFECTS on Dusky Flathead

References	
1769	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.
1770	Broadhurst, MK, Millar, RB, and Brand, CP 2009, Mitigating discard mortality from dusky flathead <i>Platycephalus fuscus</i> gillnets, <i>Diseases of Aquatic Organisms</i> , 85: 157–166.
1771	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.

STATUS OF AUSTRALIAN FISH STOCKS REPORT  
Dusky Flathead (2018)

1772	Conron S., Giri K, Hamer P and Hall K 2016, Gippsland Lakes Fishery Assessment 2016. Fisheries Victoria Science Report Series No. 14
1773	Department of Primary Industries 2018, NSW DPI Commercial catch records, New South Wales Department of Primary Industries, Sydney.
1774	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, Fisheries Science, 71: 1217–1228.
1775	Gray, CA and Barnes, LM 2008, Reproduction and growth of dusky flathead in NSW estuaries, Fisheries final report series no. 101, NSW Department of Primary Industries, Cronulla.
1776	Henry, GW and Lyle JM, 2003, The National Recreational and Indigenous Fishing Survey. Tasmanian Aquaculture and Fisheries Institute, Hobart. FRDC 99/158
1777	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.
1778	Ingram, BA, Hall, K, and Conron, S 2016, Recreational fishery assessment 2016 – small eastern estuaries. Recreational Fishing Grants Program Research Report, Victorian Government, Department of Economic Development, Jobs, Transport and Resources.
1779	Kemp, J, Bruce, T, Conron, S, Bridge, N, MacDonald, M and Brown, L 2013, Gippsland Lakes (non-bream) fishery assessment 2011, Fisheries Victoria assessment report series no. 67, Fisheries Victoria, Victoria.
1780	Kailola, PJ, Williams, MJ, Stewart, PC, Reichelt, RE, McNee, A and Grieve, C 1993, Australian Fisheries Resources, Bureau of Rural Resources and the Fisheries Research and Development Corporation, Canberra, Australia.
1781	Moreton Bay Seafood Industry Association 2012, Moreton Bay tunnel net fishery code of best practice.
1782	Pollock, BR 2015, The annual spawning aggregation of Dusky Flathead <i>Platycephalus fuscus</i> at Jumpinpin, Queensland. Proceedings of the Royal Society of Queensland.
1783	Department of Agriculture and Fisheries 2018, Queensland Stock Status Assessment Workshop Proceedings 2018. Species Summaries. 19–20 June 2018, Brisbane.
1784	Then, AY, Hoenig, NJ, Hall, NG, Hewitt, DA 2014, Evaluating the predictive performance of empirical estimators of natural mortality rate using information on over 200 fish species. ICES Journal of Marine Science.
1785	Uhlmann, SS and Broadhurst, MK 2015, Mitigating unaccounted fishing mortality in gillnets and traps. Fish and Fisheries, 16: 183–229.
1786	Webley, J, McInnes, K, Tiexiera, D, Lawson, A and Quinn R 2015, Statewide Recreational Fishing Survey 2013–14, Department of Agriculture and Fisheries, Queensland.
1787	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.