Stock status summary

Information provided in this summary constitutes a review of stock structure and indicators consistent with informing a species status determination using a weight-of-evidence approach, such as is used in the Status of Australian Fish Stocks reports (SAFS; www.fish.gov.au/). Where data are unavailable or insufficient to reliably inform those criteria, this has been indicated by 'NA', rather than removing the criteria. This has been done to clearly indicate what data were available and highlight areas where alternate or additional data sources or analyses may be required to improve species status determination in the future.

Biology and stock structure

Bass Groper (*Polyprion americanus*) is a large demersal perciform with a global anti-tropical distribution (Ball et al. 2000; Wakefield et al. 2013). The species occurs throughout NSW, with adults found on the continental slope at depths typically exceeding 300 m. The species also associates with seamounts (Sedberry et al. 1999).

Demographic information, including age, maturity and fecundity, is unavailable for the species in NSW. Investigations in other regions indicate that the species attains a large size (up to 200 cm total length, TL; Roberts 1989) and weight (up to 100 kg; Roberts 1989), is long lived (up to 78 years; Wakefield et al. 2013), and late maturing (11–14 years; Wakefield et al. 2013).

Length samples (n = 354) obtained from the commercial fishing sector in NSW during the 1990s indicated a high proportion of large (>100 cm TL) individuals. The length range (58–154 cm TL) was similar to that found in other regions (Sedberry et al. 1999; Peres and Haimovici 2004; Wakefield et al. 2013).

The stock structure of Bass Groper in NSW is unknown, but panmixia is expected throughout the region, owing to the extended larval/juvenile phase (years) and large-scale genetic homogeneity of the species in other regions (Roberts 1996; Sedberry et al. 1996; Ball et al. 2000; Wakefield et al. 2010).

Stock status and assessment method

The NSW Bass Groper stock is classified as **undefined**.

Given the insufficient data available for a quantitative stock assessment, a review of indicators (weight-of-evidence approach) was used to assess the NSW Bass Groper stock. Despite low (<10 t) total catch and relatively stable catch rates, the lack of knowledge regarding local stock structure, biology and recreational catch, combined with considerable uncertainty surrounding estimates of catch rate, provide insufficient information with which to determine a stock status.

Fishery statistics summary

Information presented in figures and tables below is summarised by fiscal year (July–June). Reference to 'year' refers to the first year within a fiscal year unless otherwise stated. For example, 2009 refers to the fiscal year 2009/10.

Between 1997/98 and 2008/09 (inclusive), fishers reported monthly catch and effort (days). From 2009/10, monthly reports of daily catch and effort (hours) metrics have been required. To construct a longer time series of data (i.e. from 1997/98 to present), daily records from 2009/10 are re-aggregated into monthly catches (kg) by fisher and gear type, with effort in days per month estimated from the number of distinct fishing dates in each month when the method was used and there was a reported landing of the species of interest in that month, irrespective of whether the species was reported on each day, to be consistent with earlier reporting.

Management arrangements including input controls and modified Ocean Trap and Line (OTL) Fishery endorsements to restrict fishing east and west of the 100 fathom depth contour (i.e. OTL–Line East and OTL–Line West, respectively) are described in the NSW Fisheries Management (Ocean Trap and Line Share Management Plan) Regulation 2006 (NSW DPI Fisheries 2017). Changes to the endorsement limited the number of fishers endorsed to access deep waters, and hence Bass Groper, and prohibited OTL–Line West-endorsed fishers from landing Bass Groper (as well as other species). Given the historical catch considerations in the allocation of the endorsements and the generally deep-water distribution of Bass Groper, the change to this fishing endorsement is not considered to have substantially impacted on the catch of Bass Groper through time. All reported catches of Bass Groper are presented below, unless otherwise stated in the text and captions.

Catch information

Commercial

Single-species data is only available after 1997/98 when reporting for Bass Groper was separated from congener *P. oxygeneios*.

Total annual reported commercial catch of Bass Groper is low (<10 t since 2004/05, Figure 1). Catch increased from 2.3 t during 1998/99 to 10.6 t during 2004/05, after which catch decreased to 3.0 t during 2008/09. Catch has remained relatively stable since 2008/09, with the lowest catch of 2.1 t taken during the most recent complete reporting year (2016/17).

Droplining accounted for most of the total catch prior to 2011/12 (mean: 88%, range: 58–98%),after which catches by this method decreased relative to other methods (mean: 30%, range: 17–48%). The trend in dropline catch was similar to total catch until 2008/09, after which dropline catch continued to decline gradually to very low levels in the most recent reporting year (0.4 t, 2016/17).

Handlining has accounted for the majority of total catch since 2012/13 (mean 65%, range: 55–75%). Trends in handline catch differed to trends in both total catch and dropline catch, with low (<1 t) catches showing no clear trend between 1997/98 and 2009/10, followed by an increase in catch to 4.3 t during 2014/15 and a subsequent decrease to 1.5 t during the

Catch information

most recent complete reporting year (2016/17).

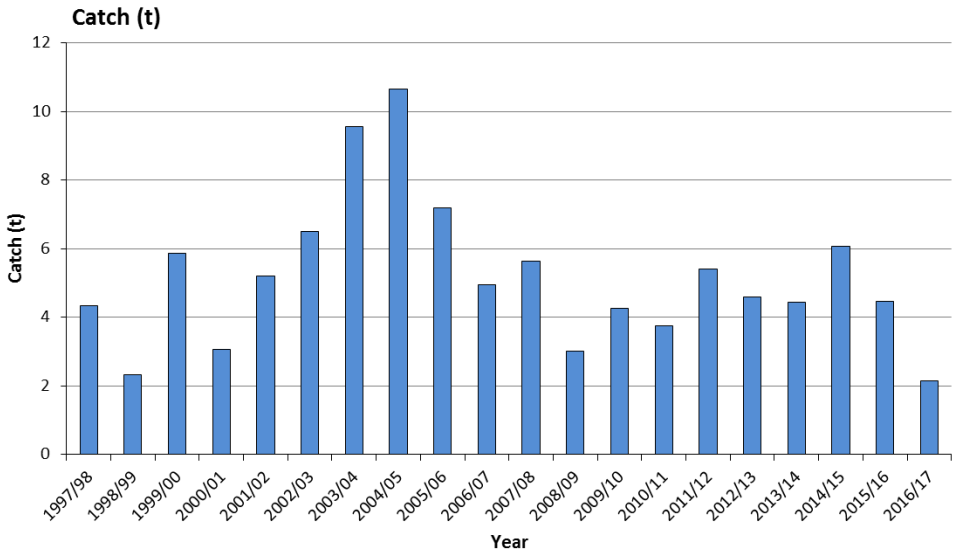

Figure 1 **All methods and fisheries combined – Total catch (t) of Bass Groper from 1997/98 to 2016/17.**

Recreational and Indigenous

Recreational and Indigenous catches are currently unknown. Bass Groper are highly valued by recreational anglers in Australia (Wakefield et al. 2013), and recreational catch may comprise a substantial proportion of the total catch in NSW. Henry and Lyle (2003) estimated the NSW annual recreational harvest of Rock Cod/Gropers (including Hapuku and nine other 'offshore/deep' species) in 2000/01 to be 4,770 (± 1,532) individuals. West et al. (2015) reported no recreational catch of Bass Groper in NSW in 2013/14 but this survey does not include catches of Bass Groper made by non-NSW/ACT residents. In 2016/17, the NSW charter fishing sector reported catching one individual Bass Groper.

There is a combined recreational bag limit of five and a boat limit of ten Hapuku, Banded Rockcod, Bass Groper, Gemfish and Blue-eye Trevalla. The boat limit applies to all recreational fishers, including charter fishers.

Illegal, Unregulated and Unreported (IUU)

The extent of Illegal, Unregulated and Unreported (IUU) fishing is unknown.

Effort information

Commercial

The trend in total annual commercial effort was similar to that for total catch, with effort increasing from 299 days during 1998/99 to 701 days during 2007/08, followed by a decrease to 352 days by 2010/11 (Figure 2). Effort following this period remained relatively steady, with the exception of a decline in the most recent complete reporting year (258 days, 2016/17).

The trend in dropline effort was similar to total effort, except for a decrease following 2007/08 to a low of 85 days in the most recent complete reporting year. The pattern in dropline effort was similar to dropline catch.

Handline effort showed no clear trend between 1997/98 and 2010/11. Effort increased to 249 days during 2013/14, followed by a decrease to 123 days during the most recent complete reporting year (2016/17).

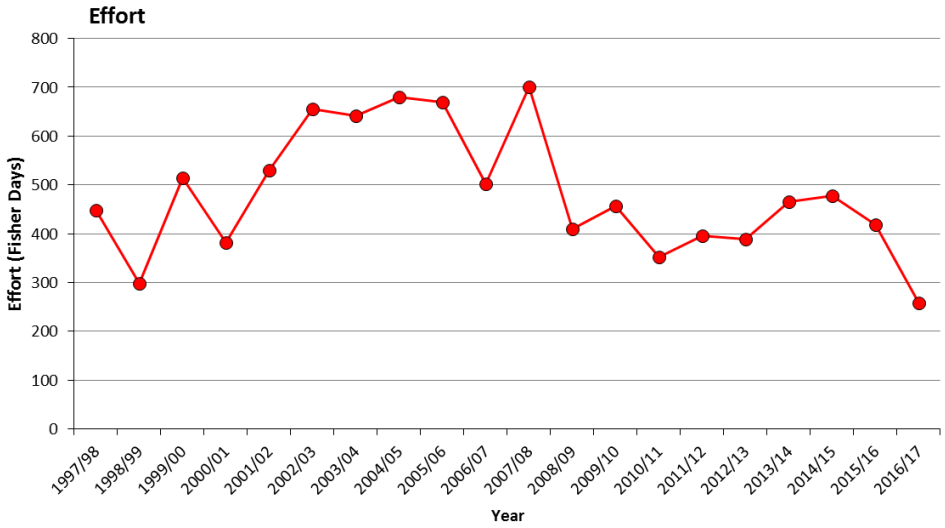

Figure 2 **All methods and fisheries combined – Total effort (days) for Bass Groper from 1997 to 2017.**

Recreational and Indigenous

Data for recreational and Indigenous effort are unavailable.

Henry and Lyle (2003) reported that the level of recreational offshore (>5 km from shore) fishing effort in NSW was 1.3% of the state-wide total, equating to 101,480 (± 32,176) fishing events. West et al. (2015) reported offshore (>5 km) fishing effort comprised <2% (54,773 fisher days) of all reported NSW recreational fishing effort.

Catch rate information

Standardised catch per unit effort (CPUE) in days ($CPUE_{dy}$) for droplining showed no clear trend over the available reporting period (1997/98-2016/17; Figure 3). A peak in $CPUE_{dy}$ was observed during 2003/04; however, the confidence interval for this value overlapped with those from other years.

Median nominal $CPUE_{dy}$ for handline showed no clear trend over the available reporting period (1997/98-2016/17). Peaks in $CPUE_{dy}$ were observed during 2000/01 and 2010/11, with the 95% confidence interval surrounding the latter value not overlapping with those from preceding years.

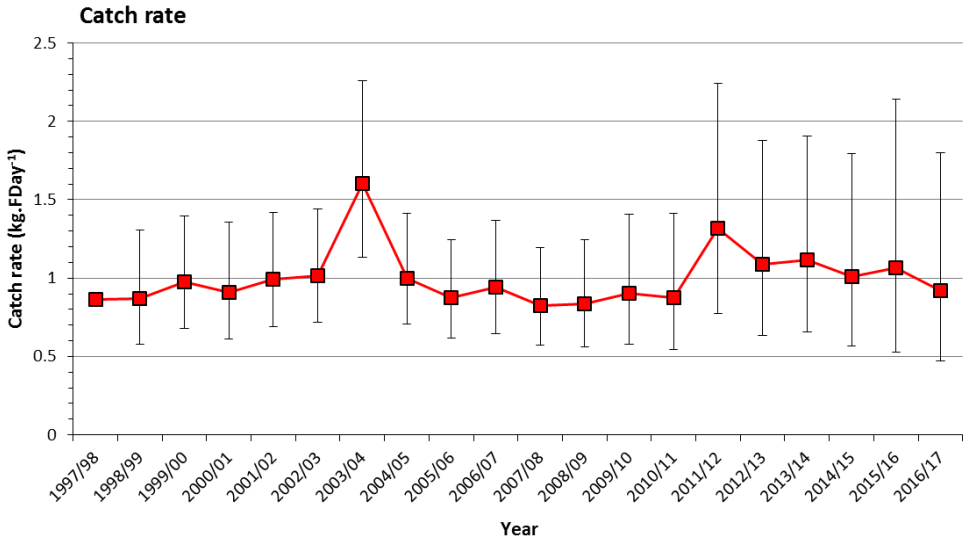

Figure 3 Droplining – Standardised CPUE (kg.day^{-1}) for Bass Groper from 1997 to 2017. Error bars represent 95% confidence intervals.

Stock assessment – list of indicators

Year of most recent assessment	2018 – **undefined**
Assessment method	Weight of evidence
Main data inputs	Commercial catch (t) – 1997/98 to 2016/17 Standardised dropline CPUE (kg.day^{-1}) – 1997/98 to 2016/17 Median nominal handline CPUE (kg.day^{-1}) – 1997/98 to 2016/17

Stock assessment – list of indicators	
Main data inputs (rank)[†]	Commercial catch: (medium quality), historical time series, but some reporting changes and likely misreporting, limited quality control/error validations $CPUE_{dy}$ dropline: (low quality), compromised by significant reporting changes and inaccuracies in effort data $CPUE_{dy}$ handline: (low quality), compromised by significant reporting changes and inaccuracies in effort data
Key model structure and assumptions	NA - no model-based quantitative assessment approach was used
Sources of uncertainty evaluated	Known or likely uncertainties in the key indicators were taken into consideration in ranking the quality of data inputs, and in reaching a conclusion regarding stock status based on the relative weighting of these indicators

[†] Main data inputs (rank)

1 – High quality: data have been subjected to documented quality assurance and peer review processes, are considered representative and robust and provide a high level of confidence to support fisheries management decisions.

2 – Medium quality: data have been subjected to some internal quality assurance processes, have some documented limitations, but are still considered sufficiently accurate and informative to be useful to inform management decisions with some caveats.

3 – Low quality: data have been subjected to limited or no quality assurance processes, may be compromised by unknown or documented limitations that have not been fully explored, but are considered the best available information and require a high level of precaution to be exercised when interpreted to inform management decisions.

Status indicators and limits – reference levels	
Biomass indicator or proxy	Standardised CPUE. Used to indicate whether biomass is likely to be increasing, decreasing or stable under current catches and effort
Biomass limit reference level	NA – no biomass limits or targets have been set
Fishing mortality indicator or proxy	NA – no agreed proxy of fishing mortality has been defined
Fishing mortality limit reference level	NA – no fishing mortality limit has been set
Target reference level	NA – no fishing mortality targets have been set

Stock assessment results – review of indicators	
Biomass status in relation to limit	NA – no biomass limits or targets have been set
Fishing mortality in relation to limit	NA – no fishing mortality limit has been set
Previous SAFS stock status	Previously unassessed
Current SAFS stock status	Not scheduled for assessment in 2018

Fishery interactions

Bass Groper are primarily caught as bycatch when droplining for Blue-eye Trevalla (*Hyperoglyphe antartica*). Catches of Bass Groper and associated fishery statistics may therefore be influenced by changes in the Blue-eye fishery.

Bass Groper are landed in Australian Commonwealth fisheries from waters off the east coast of Australia. Catch reporting is combined with congener *P. oxygeneios*, with an average annual catch of 3.9 t for this group between 2007 and 2016 (AFMA 2018). Similar to *P. oxygeneios*, Bass Groper are not quota managed in the Commonwealth and AFMA does not undertake a fishery assessment for this species.

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