Stock status summary - Bigeye Ocean Perch - 2020

The fishery scientific assessment summarised in this report and considered adequate to meet the legislative requirements for supporting a total allowable catch (TAC) determination for the NSW Bigeye Ocean Perch is that done by the CSIRO, commissioned by the Australian Fisheries Management Authority (AFMA) and published as 'Bigeye Ocean Perch' in the 'Ocean Perch (*Helicolenus barathri*, *H. percoides*)' section of the Fishery Status Reports by the Australian Bureau of Agricultural and Resource Economics and Sciences (Patterson et al. 2019; hereinafter referred to as the Commonwealth assessment).

The structure of this stock status summary is consistent with a format to inform a species status determination against criteria for the Status of Australian Fish Stocks (SAFS; www.fish.gov.au). It does not attempt to replicate the detail of the Commonwealth assessment but sources and cites key information from that assessment. Where data are unavailable or considered insufficient to reliably inform the SAFS criteria the summary has been populated with 'NA', rather than removing the criteria. This format has been maintained to transparently represent the data available and highlight areas where supplementary information, alternate data sources or analyses may be required to improve the assessment and determination of species status into the future.

Assessment authors and Year

Lowry M. and R.C. Chick. 2020. Stock status summary – Bigeye Ocean Perch 2020. NSW Department of Primary Industries. Fisheries NSW, Port Stephens Fisheries Institute. 10 pp.

Biology and stock structure

Ocean Perch are lecithotrophic and viviparous, meaning that egg fertilization and larval development occur inside the female fish. The larvae are released when they reach about 1 mm in length. The Ocean Perch breeding season extends from June to November and a single female can produce between 150,000–200,000 larvae per season. Ocean Perch are ambush predators, rising quickly from the ocean floor to capture prey. Main food sources for Ocean Perch are Royal Red Prawns, squid and smaller fish. Bigeye Ocean Perch is distributed on the upper-slope of the continental slope and more commonly found in 250–800 m.

Within the Commonwealth, Ocean Perch is managed as a single stock that includes two species: the Inshore Ocean Perch (*Helicolenus percoides*) and the Offshore Ocean Perch (*H. barathri*; hereinafter referred to as Bigeye Ocean Perch). Ocean Perch stock structure is uncertain, but there is probably an east–west structuring of stocks (Morison et al. 2013). Reef Ocean Perch and Bigeye Ocean Perch have been assessed separately in the Commonwealth since 2009, but a single all-areas Commonwealth TAC is set for the two species. Based on the

depth of capture and logbook records, most of the landed Ocean Perch is considered to be Bigeye Ocean Perch (Patterson et al. 2019).

Stock status and assessment method

The Commonwealth assessment for Bigeye Ocean Perch is a Tier 4 assessment (AFMA 2017), i.e. standardised catch per unit effort (CPUE), including discards (Haddon and Sporcic 2017; Sporcic and Haddon 2018). The current Commonwealth assessment of Bigeye Ocean Perch classifies the stock as not overfished and not subject to overfishing (Patterson et al. 2019).

Bigeye Ocean Perch has been assessed as **Sustainable** against the criteria for SAFS in 2018.

Fishery statistics summary

Fishery statistics presented in this report are restricted to those used to inform the Commonwealth assessment and are summarised here from Patterson et al. (2019) and references therein. The Commonwealth assessment of Bigeye Ocean Perch uses data from the Commonwealth "Commonwealth Trawl Sector (CTS) within Commonwealth fishing zones 10 and 20 (south-eastern Australia) and catch records from depths from 200–700 m depth.

Catch information

The catch information below is summarised from Paterson et al. (2019).

Bigeye ocean perch has been a significant part of trawl catches since the continental-slope trawl fishery developed in the late 1960s (Morison et al. 2013). Total landed catch (both species) of ocean perch since the 1970s has generally been between 200 and 400 t, peaking at 475 t in 1997. The Commonwealth-landed catch in the 2018–19 fishing season was 194 t (Figure 1).

Most (inshore) reef ocean perch are discarded because of their smaller size. About 85% of total mortalities (catch plus discards) were discards (Castillo-Jordán et al. 2018). Weighted average discards of (inshore) reef ocean perch between 2014 and 2017 were 54 t, and average state catches were 4.1 t (Castillo-Jordán et al. 2018). Discards for (offshore) bigeye ocean perch are lower; about 30% of total mortalities (catch plus discards) were discards (Castillo-Jordán et al. 2018). Weighted average discards of (offshore) bigeye ocean perch between 2014 and 2017 were 58.3 t, and average state catches were 15.12 t (Castillo-Jordán et al. 2018).

Catch information
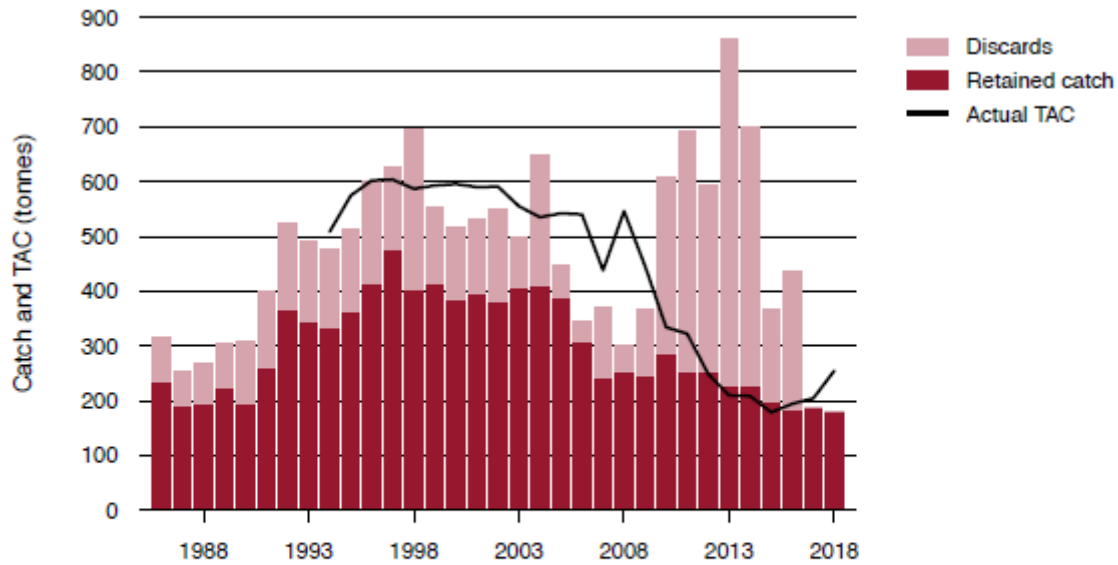
Notes: **TAC** Total allowable catch. Data for 2017 and 2018 exclude discards and state catch.
Sources: Haddon & Sporcic 2017b; AFMA catch disposal records (2017–2018 catch data)

Figure 1   **Total Ocean Perch (Reef and Bigeye) annual catches (Commonwealth Trawl Sector, Scalefish Hook Sector and state combined) and fishing season total allowable catches (TACs), 1986 to 2018 (from Patterson et al. 2019).**

Recreational and Indigenous

Recreational catches have not been accounted for in the Commonwealth assessment of Ocean Perch. The inclusion of recreational catch has been raised as an issue for consideration in Commonwealth assessments (SESSF RAG 2017).

Illegal Unregulated and Unreported

The level of Illegal Unregulated and Unreported (IUU) fishing has not been quantified.

Catch rate information

Bigeye Ocean Perch standardised CPUE analyses using data to 2012 (Sporcic and Haddon 2018), are presented in Figure 2 below (from Patterson et al. 2019).

Text summarised from Paterson et al. (2019).

> The standardised CPUE and associated tier 4 assessment by Haddon and Sporcic (2017) underpinned the management of reef and bigeye ocean perch for the 2018–19 season.
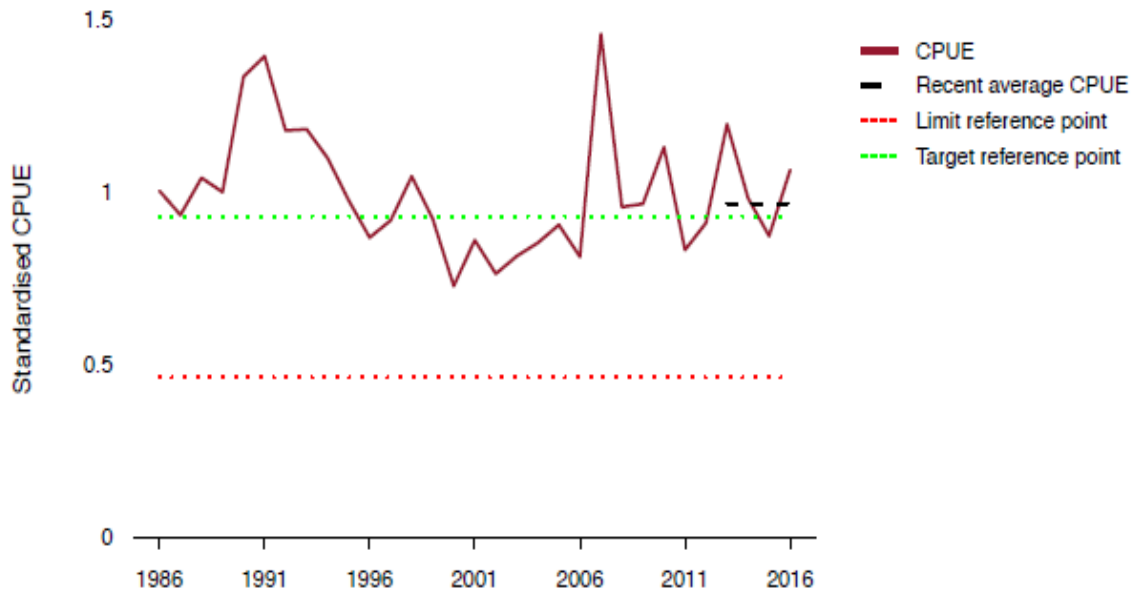
Catch rate information

Figure 2   Standardised CPUE, including discards, for Bigeye Ocean Perch, 1986 to 2016 (Source: Haddon and Sporcic 2017 cited in Patterson et al. 2019).

The 2017 tier 4 analyses produced an RBC of 247 t for reef ocean perch and 345 t for bigeye ocean perch (Haddon & Sporcic 2017). The RAG noted that the high discard rate for reef ocean perch had made the standardisation and associated tier 4 analyses uncertain, and, given the amount of discards required to be deducted, would have resulted in a TAC of zero (AFMA 2018b). The RAG recommended that reef ocean perch be removed from the ocean perch quota basket and that a catch trigger be set for the species instead (AFMA 2018a). Accordingly, the TAC was determined based on the RBC for offshore ocean perch only and was set at 241t for 2018–19, the first year of a three-year MYTAC (AFMA 2018a).

Stock assessment methodology

Year of most recent assessment	2017 (Haddon and Sporcic 2017, in Patterson et al. 2019)
Assessment method	Commonwealth Tier 4, Standardised CPUE (including discards)
Main data inputs	CPUE – Commonwealth Trawl Fishery; zones 10–20; depth 200–700 m

Stock assessment methodology

	Discard rates (Castillo-Jordán et al. 2018)
Main data inputs (rank)[†]	CPUE – 2 (medium quality) – (Haddon and Sporcic 2017; Sporcic and Haddon 2018)
	Discard rates: 2 (medium quality) – (Castillo-Jordán., et al, 2018)
Key model structure and assumptions	Tier 4 – Standardised CPUE (Commonwealth Harvest Strategy Policy; Commonwealth of Australia 2003, 2019) *Assumptions:* • That standardised catch rates are a valid representation of changes in stock abundance and • Can thus be used as a relative index of abundance for assessment purposes and • Are not unduly influenced by other factors not accounted for through standardisation (see Sporcic and Haddon 2018)
Sources of uncertainty evaluated	Uncertainty associated with Tier 4 assessment (see Haddon and Sporcic 2017; Sporcic and Haddon 2018)

[†] 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 (AFMA 2017)
Biomass limit reference level	$CPUE_{20}$ (AFMA 2017)

Status indicators and limits – Reference levels

Fishing mortality indicator or proxy	NA
	
	Implied from Patterson et al. 2019:
	
	    Catch (including discards) as a proportion of recommended biological catch (RBC)
	
	    Trend in CPUE

Fishing mortality limit reference level	Implied from Patterson et al. 2019: Catch (plus discards) as a proportion of RBC is <1
Target reference level	$CPUE_{40}$ (note $CPUE_{40}$ is B_{MSY} proxy) (AFMA 2017; Haddon and Sporcic 2017)

Stock Assessment Results

Biomass status in relation to limit	**Not overfished** – standardised CPUE (biomass proxy) is above limit (Patterson et al. 2019)
Fishing mortality in relation to limit	**Not subject to overfishing** (Patterson et al. 2019)
Previous SAFS stock status	2018: **Sustainable**
Current SAFS stock status	Bigeye Ocean Perch is to be assessed in 2020, status is not yet determined

Fishery interactions

Interactions between the Commonwealth Trawl and Auto Long Lining sectors are described by Sporcic and Haddon (2018); declines in the Trawl sector since the mid-2000s are associated with increased catches in the Auto Long Lining sector. Concurrent with general declines in Trawl catches are increased and sustained relatively high geometric mean CPUE for the Trawl fishery (Sporcic and Haddon 2018)

The Commonwealth Trawl Sector interacts with other commercial and non-commercial bycatch and discard marine species, a range of endangered threatened and/or protected species and marine habitats (AFMA 2014; Wayte et al. 2007).

NSW Fishery

Information presented in figures and tables below is summarised by fiscal year (July–June).

NSW commercial fishery records have not been consistently reported throughout the history of the fishery, due to changes in reporting requirements (Chick and Johnson 2018). Between 1997/00 and 2000/01, management arrangements in the OTL Fishery changed such that endorsements were allocated inside (OTL – Line West (OTLLW)) and outside (OTL – Line East (OTLLE)) the 100 fathom depth contour. Prior to 2009/10 Bigeye Ocean Perch were reported to the multi-species group 'Ocean Perch'. As a result, species specific fishery data are unavailable prior to 2009/10. The commercial fishery data presented in this section is limited to data from key fisheries, primarily the OTL Fishery (Eastern Zone) from 2009/10, as contemporary supplementary information to the assessment and to help inform NSW TAC determinations.

State-wide fisheries catch

Bigeye Ocean Perch are caught predominantly in two fisheries within NSW; the OTL Fishery (Eastern Zone, OTLLE) and the Ocean Fish Trawl – Northern (OTFN) Fishery (Table 1). Since 2009/10, the annual catch of Bigeye Ocean Perch across all fisheries has averaged about 16 t.yr^{-1} and in 2018/19 total catch was 17.3 t. Since 2009/10, the OTLLE Fishery has accounted for an average of 92% (range 66–100%) of the total annual catch of Bigeye Ocean Perch, which has ranged between 9.9 and 20.8 t (Table 1). In 2018/19, 17.2 t of Bigeye Ocean Perch were reportedly landed in the OTLLE Fishery (Figure 1, Table 1). An average of <1 t.yr^{-1} (range 0.0 to 2.8 t yr^{-1}) of Bigeye Ocean Perch has been reported from the Ocean Trawl Fish (Northern Zone; Figure 1, Table 1). The remaining 'other' catch has averaged 0.5 t.yr^{-1} (range 0.0 to 2.3 t.yr^{-1}; Table 1), with those catches distributed among eleven separate share classes within five NSW fisheries.
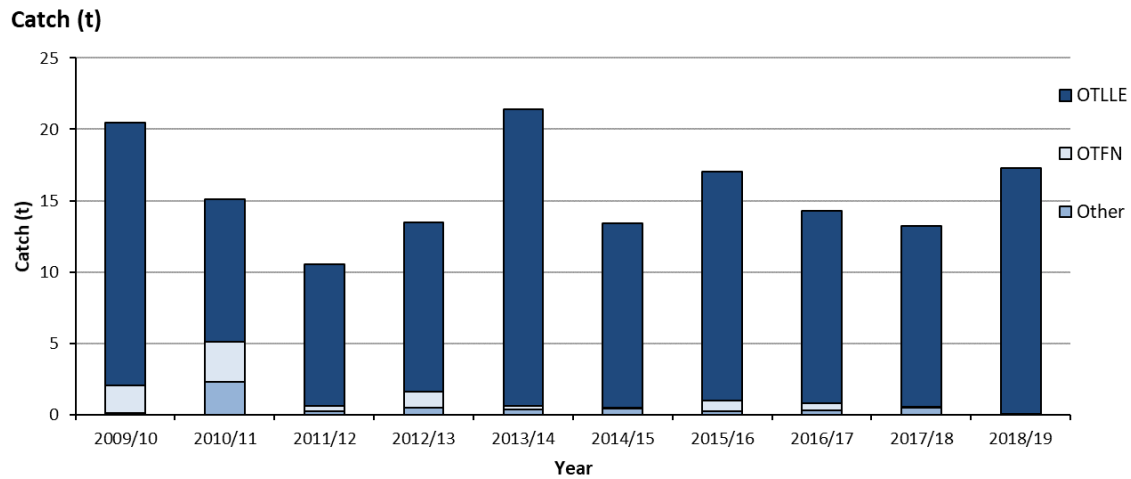
Catch (t)

Figure 3   Annual catch (t) of Bigeye Ocean Perch from the NSW Ocean Trap and Line – Line East (OTLLE), Ocean Trawl Fish – Northern (OTFN) and Other Fisheries from 2009/10 to 2018/19.

Table 1   Annual catch (t) of Bigeye Ocean Perch and as a percentage of total catch (% total) from the NSW Ocean Trap and Line (Eastern Zone) Fishery (OTLLE), Ocean Trawl Fishery – Northern Zone (OTFN) and all other Fisheries (Other) from 2009/10 to 2018/19.

Year	OTLLE		OTFN		Other		Total
	Catch (t)	% total	Catch (t)	% total	Catch (t)	% total	Catch (t)
2009/10	18.5	90.1	1.9	9.2	0.1	0.7	**20.5**
2010/11	10.0	66.1	2.8	18.7	2.3	15.2	**15.1**
2011/12	9.9	94.2	0.4	3.5	0.2	2.3	**10.5**
2012/13	11.9	87.9	1.1	8.5	0.5	3.6	**13.5**
2013/14	20.8	97.2	0.2	1.1	0.4	1.7	**21.4**
2014/15	12.9	96.5	0.1	0.4	0.4	3.1	**13.4**
2015/16	16.1	94.2	0.8	4.4	0.2	1.3	**17.0**
2016/17	13.5	94.3	0.5	3.8	0.3	2.0	**14.3**
2017/18	12.7	96.0	0.0	0.2	0.5	3.9	**13.2**
2018/19	17.2	99.6	0.0	0.2	0.0	0.2	**17.3**

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