Southern Sand Flathead (*Platycephalus bassensis*)

Stock Structure and Biology

Southern Sand flathead are distributed along the entire Victorian coast in coastal waters and in all bays and inlets. The most important fishery for this species is in Port Phillip Bay, with smaller fisheries in Western Port, Corner Inlet, and coastal waters. Most of the Victorian sand flathead catch is taken by recreational anglers with only minor commercial harvesting.

The main Port Phillip Bay component of the sand flathead stock is a predominantly self-replenishing sub-population. The primary spawning period for sand flathead is during October to March.

Sand flathead in Port Phillip Bay can live to at least 23 years and grow to a size of 40 cm TL, although fish over 35 cm are relatively uncommon. Length at 50% maturity is reached at two to five years of age at a TL between 22 and 25 cm. Sand flathead growth rate and maximum sizes are lower for Port Phillip Bay than for coastal populations. Importantly, female sand flathead grow faster, and reach larger sizes, than males, so most sand flathead above the 27 cm LML in Port Phillip Bay are females. This assessment focusses on the main fishery in Port Phillip Bay.

Assessment Summary

The status of sand flathead was evaluated using:

- Available harvest information for the commercial and recreational sectors
- Nominal CPUE for long-line in Port Phillip Bay (for historic context)
- Nominal and standardised CPUE for the recreational fishery from annual creel surveys in Port Phillip Bay (reference period 1989–2015)
- Nominal CPUE for diary angler targeted sand flathead trips in Port Phillip Bay
- Relative abundance from fishery independent trawl surveys in Port Phillip Bay
- Length composition of recreational fishery catches in Port Phillip Bay from creel surveys and diary anglers
- Pre-recruit (0+ age) abundance from fishery independent trawl surveys in Port Phillip Bay.

This assessment found:

- *Fishing pressure* – There is currently negligible commercial fishing pressure on southern sand flathead in Port Phillip Bay with virtually all of the commercial catch being taken from Bass Strait during the past five years (Figure 24). Catches in Bass Strait have been increasing in recent years but remain around, or below, 5 t. Changes in, or current status of, recreational fishing pressure are unclear. Length composition data from creel surveys has been stable over the last 15 years (Figure 25 and Figure 26).
- *Biomass* – Standardised CPUE from the creel surveys has remained relatively low (compared to historical levels) since the mid-2000s and n PPB was approximately midway between the reference period minimum (i.e. 2013/14) and reference period average in 2018/19 (Figure 27). In WPB values were mostly below the limit

reference point, with an anomalously high value at the target reference point in 2020 only, but had greater overall variability (Figure 28). Angler diarist CPUE for PPB showed relatively higher values during the past 5– 6 years among both under and legal sized fish, although values for the latter have decreased somewhat recently (Figure 29). The creel CPUE data indicates that the availability of legal sized sand flathead has stabilised since 2008 and shown signs of an increase from the lowest point in 2013 until 2020/21 (Figure 27). However, the 2021/22 financial year shows a drop to the lowest level on record, to below that of the minimum reference period. Creel surveys in Corner Inlet have only recently been introduced and therefore has limited data, nevertheless CPUE has been steadily declining over the last four years, but is must be noted sand flathead are a byproduct in this fishery (Figure 30). Consistent with creel CPUE, diary angler targeted CPUE showed a decline from the mid-2000s to the late 2000s, but since 2011 its positive trend is more pronounced than the trend in creel survey CPUE. Unlike creel CPUE, diary angler CPUE represents catch rates of fish both above and below the LML, and the recent increasing trend is influenced by greater abundance of sand flathead below the LML since 2011 (Figure 31) that do not contribute to the creel survey catch rates. Long-line CPUE (Figure 32) is not considered indicative of stock status since 2015 due to likely discarding as a result of TAC changes (multi-species TAC), but is nevertheless included for historical context along with the otter trawl survey data of mature biomass (ceased in 2011). These indicators of mature biomass show a period of higher biomass from the mid-1990s to the early 2000s (Figure 33). The ongoing small beam trawl CPUE indicates a drop in legal sized biomass from 2004 to 2006 similar to that in long-line and trawl biomass, and shows a stable, or slightly increasing, trend since 2012 consistent with the diary angler data (Figure 27). This fishery independent survey suggest sub-legal size classes are all increasing in abundance. Overall, the various CPUE data indicate sand flathead abundance is slowly increasing from an historic low during the late 2000s, however, the current increase in abundance is largely due to recent recruitment with the population now dominated by small fish below the LML. Preliminary observations suggest that sand flathead in Port Phillip Bay are now maturing at smaller sizes (J. Bell Personal observation), which may explain why few individuals appear to be reaching the LML and fishery dependent CPUE indices are not detecting an increase in the abundance of legal sized fish.

- *Recruitment* – Pre-recruit survey data clearly show that the high biomass during the mid-1990s to early 2000s was due to exceptionally strong recruitment during the late 1980s to mid-1990s (Figure 34) (note: sand flathead take about 4–5 years to recruit to the fishery). Recruitment levels since 2000 have been much lower, driving the biomass declines observed from the early 2000s to 2010. It appears that the stock has now stabilised at a lower biomass under this lower recruitment regime, and recruitment has been sufficient to balance natural and fishing mortality at this lower level. Recent recruitment events (i.e. 2009, 2013) have been important in preventing ongoing decline, and indeed driving some increase in biomass. Elevated recruitment in 2018 and 2021 is expected to contribute to the stability of the stock and may be sufficient to support continuation of a slowly increasing trend.

Stock status summary: On balance, the multiple lines of available evidence indicate that the Port Phillip Bay sand flathead population has been stable over the last decade at lower levels of abundance than during the 1990s. This indicates that recent recruitment has been sufficient to balance natural mortality and fishing impacts and that overfishing is unlikely to be occurring. There are recent signs of slow recovery in recreational catch rates, and in particular increases in sub-legal size classes, however, due to lack of recent strong recruitment events, any ongoing recovery in stock biomass is expected to remain slow.

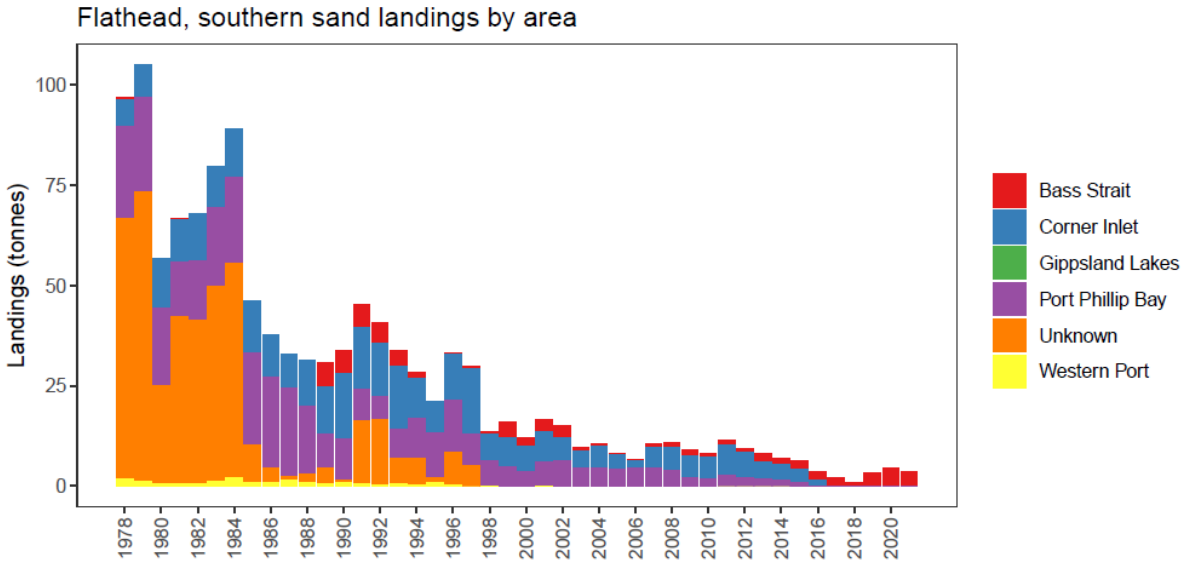
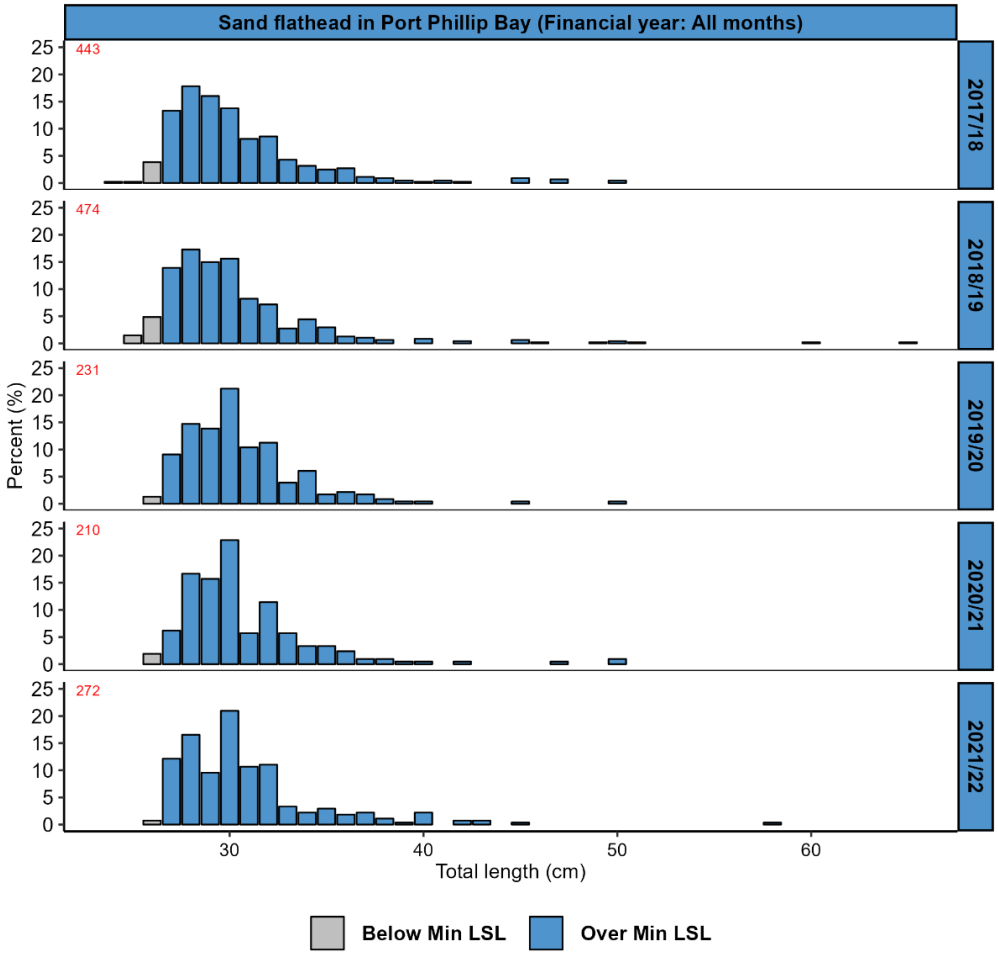


Figure 24 Victorian southern sand flathead commercial catches, financial year 1978–2021. Note: most of the catch classified as “unknown” is from Danish seine or trawl fishing in Bass Strait waters prior to the Danish seine/trawl fishery coming under Commonwealth management in 1998. Recent Commonwealth harvests are not included.

(a)



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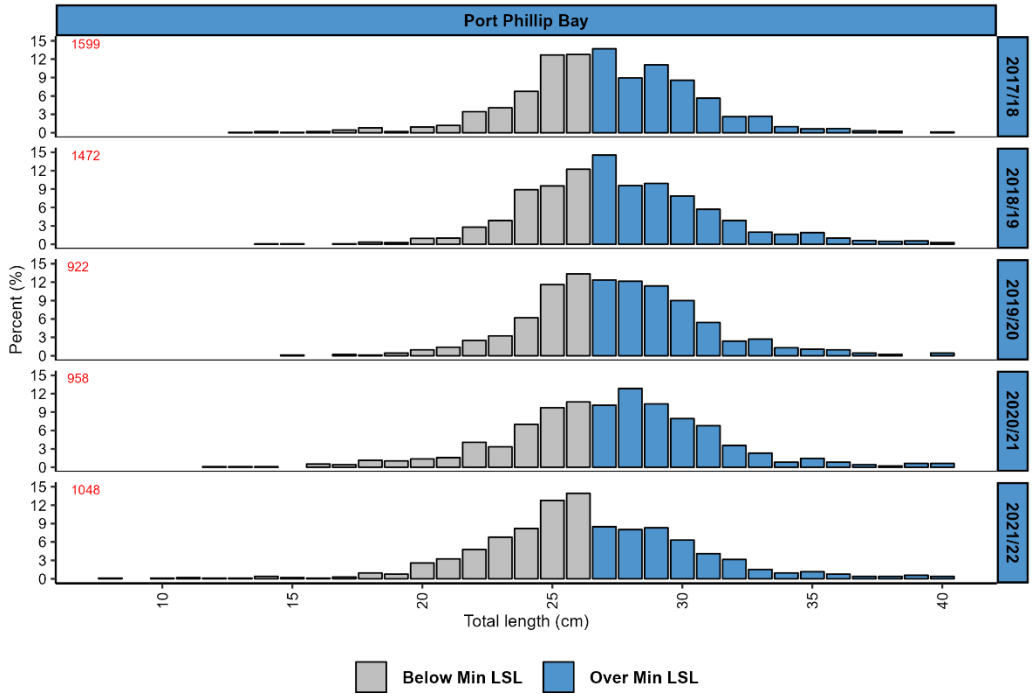

Figure 25 Frequency histograms of Port Phillip Bay recreational sand flathead length composition (a) creel surveys, (b) angler diary, fiscal years 2017/18–2021/22. Red numbers indicate numbers of fish measured. LSL = legal size limit.

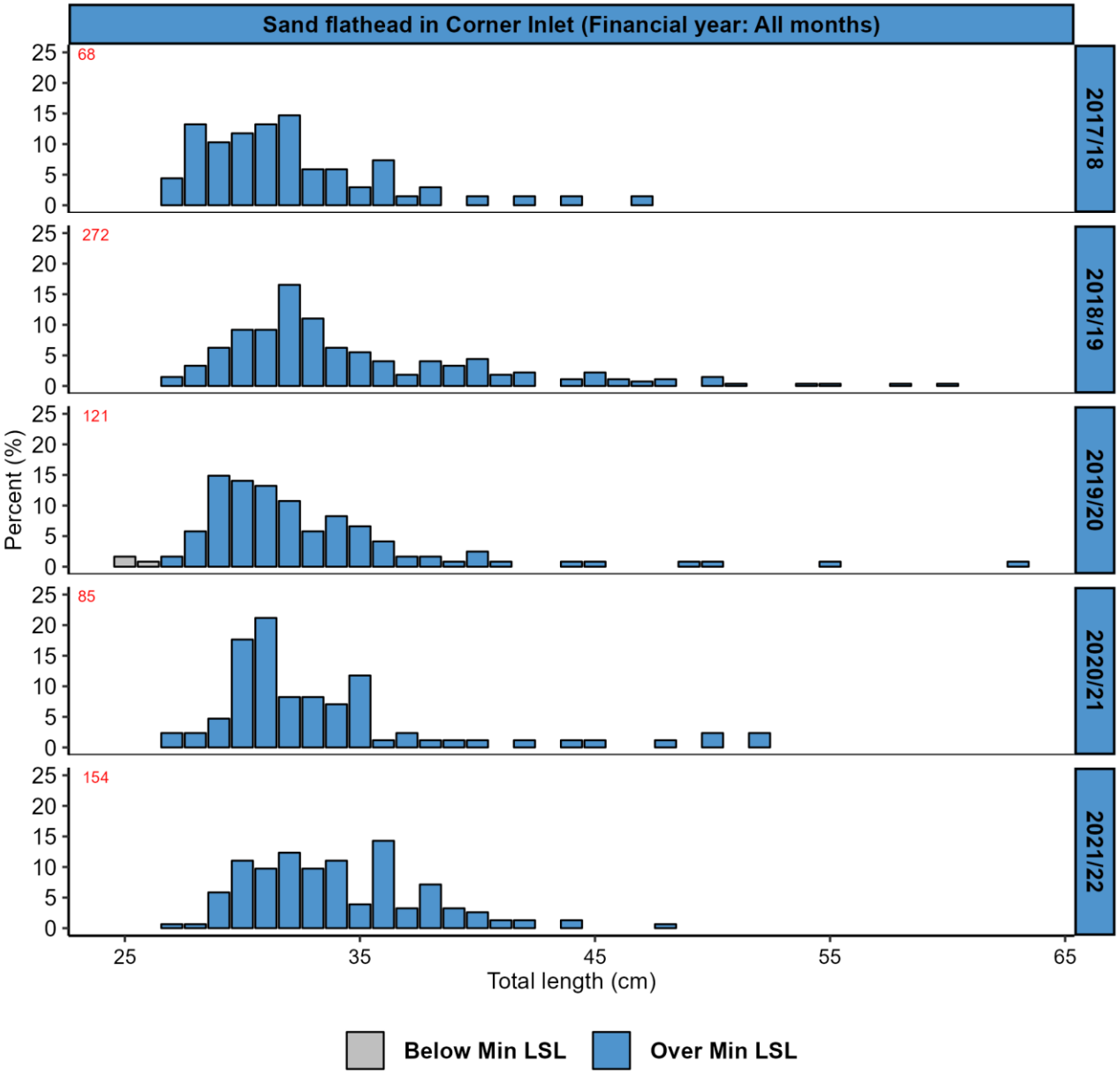

Figure 26 Frequency histogram of Corner Inlet recreational sand flathead length composition from creel surveys, fiscal years 2017/18–2021/22. Red numbers indicate numbers of fish measured. LSL = legal size limit.

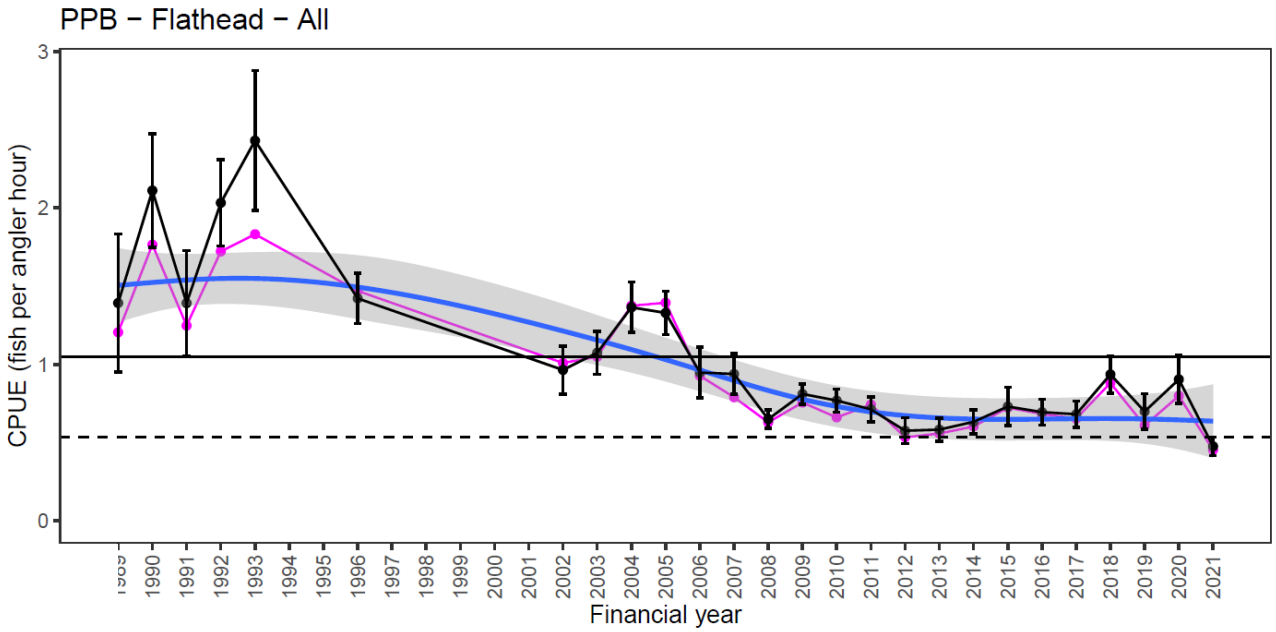

Figure 27 Catch-per-unit-effort (CPUE) of southern sand flathead by recreational anglers interviewed in creel surveys undertaken in Port Phillip Bay (PPB) during 1988/89–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model (GAM) of the standardised CPUE trend with the shaded grey area representing the 95% confidence interval of the GAM. Horizontal black line is the mean standardised CPUE during the reference period (i.e. all years up to and including 2015) and the dashed black line is the minimum standardised CPUE within the reference period. Note: Catch rates were standardised prior to 2009 when the size limit was increased from 25 to 27 cm using the proportion of fish >27 cm in the catches of fishers interviewed during creel surveys in earlier years.

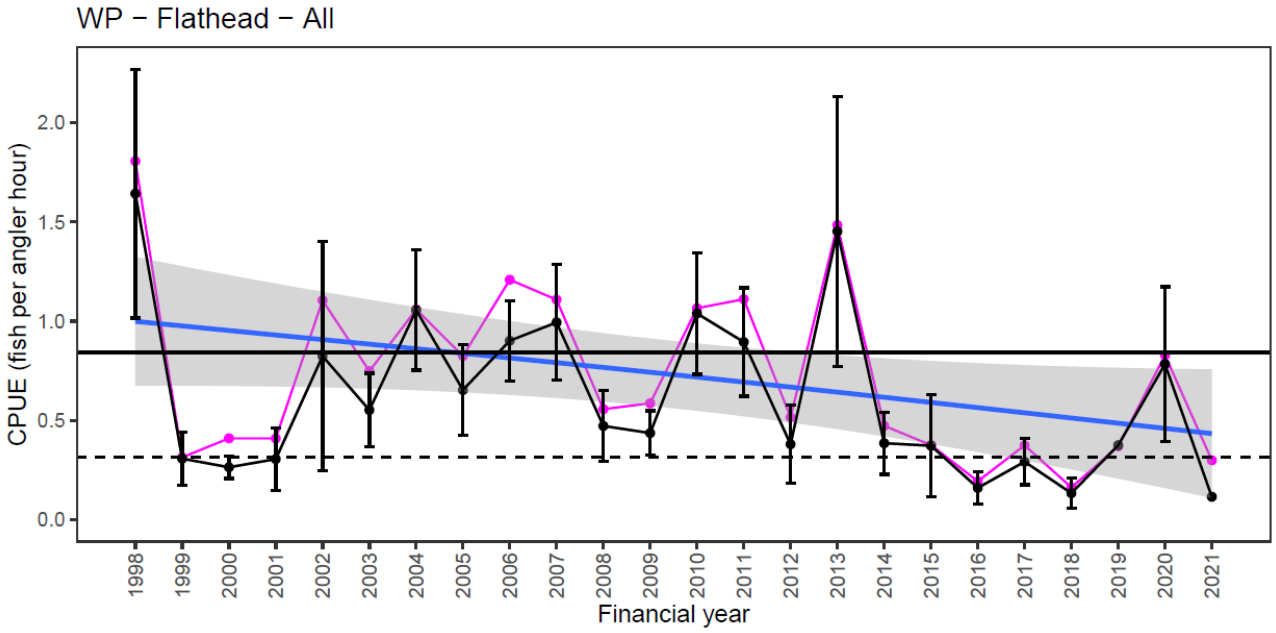

Figure 28 Catch-per-unit-effort (CPUE) of southern sand flathead by recreational anglers interviewed in creel surveys undertaken in Western Port Bay (WPB) during 1998/99–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model (GAM) of the standardised CPUE trend with the shaded grey area representing the 95% confidence interval of the GAM. Horizontal black line is the mean standardised CPUE during the reference period (i.e. all years up to and including 2015) and the dashed black line is the minimum standardised CPUE within the reference period. Note: Catch rates were standardised prior to 2009 when the size limit was increased from 25 to 27 cm using the proportion of fish >27 cm in the catches of fishers interviewed during creel surveys in earlier years.

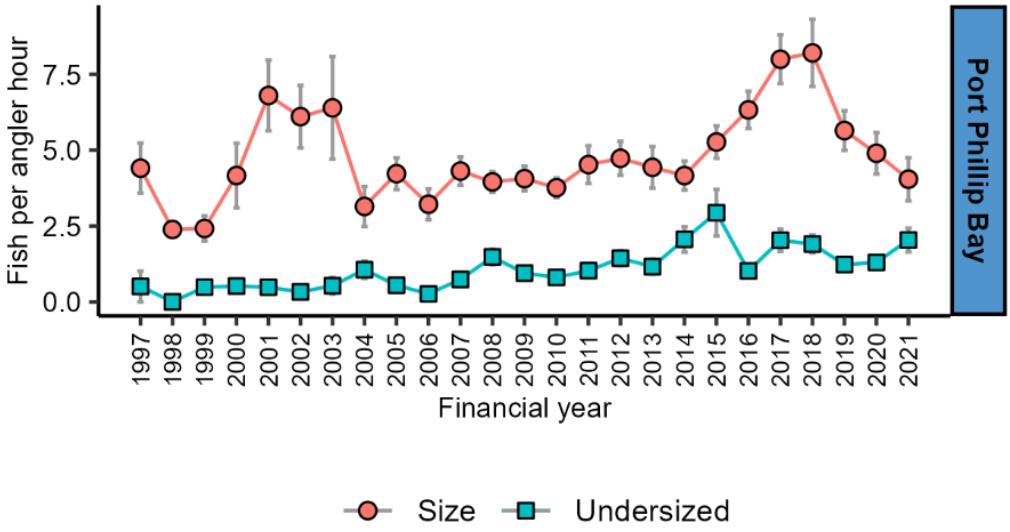

Figure 29 Catch-per-unit-effort (CPUE) of under- and over-legal minimum length southern sand flathead by recreational angler diarists in Port Phillip Bay (PPB) during 1997/98–2021/22 financial years.

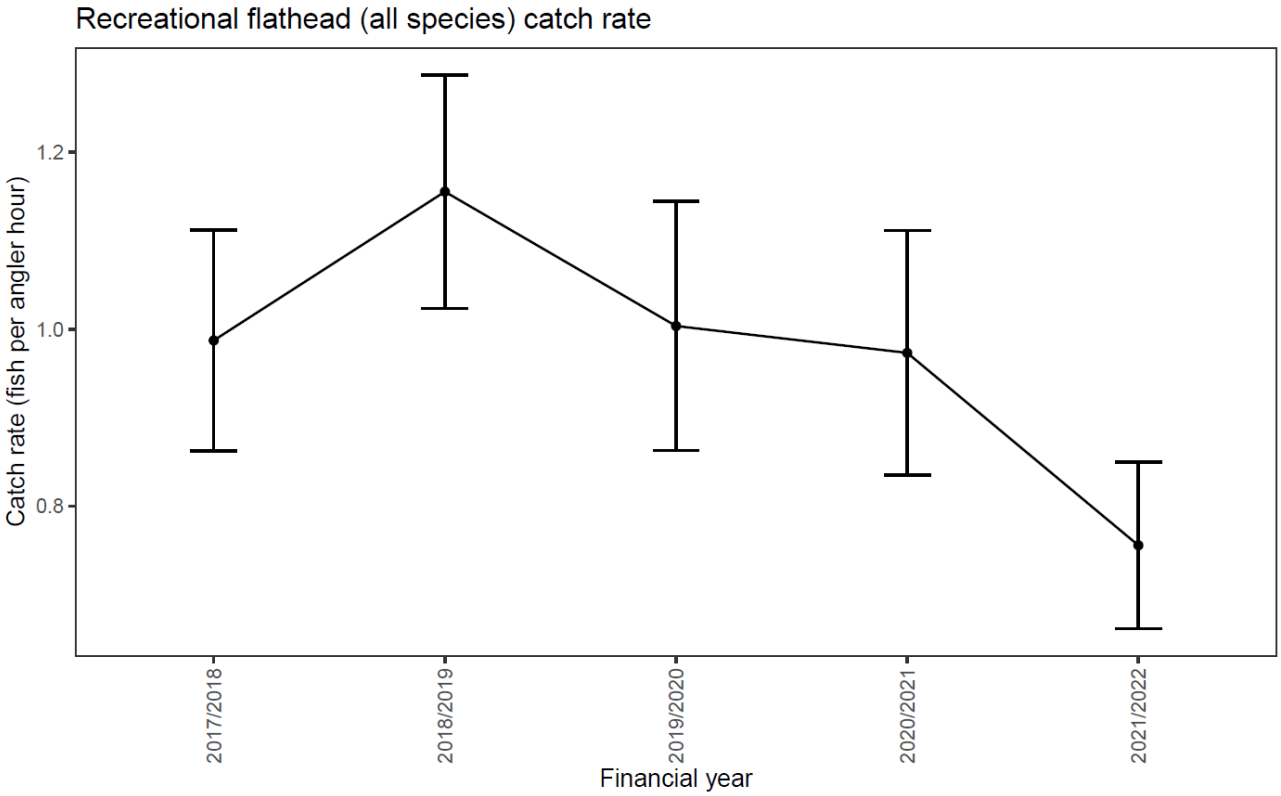

Figure 30 Catch-per-unit-effort (CPUE) of all flathead species by recreational anglers interviewed in creel surveys undertaken in Corner Inlet (CI) during 2017/18-2021/22 financial years.

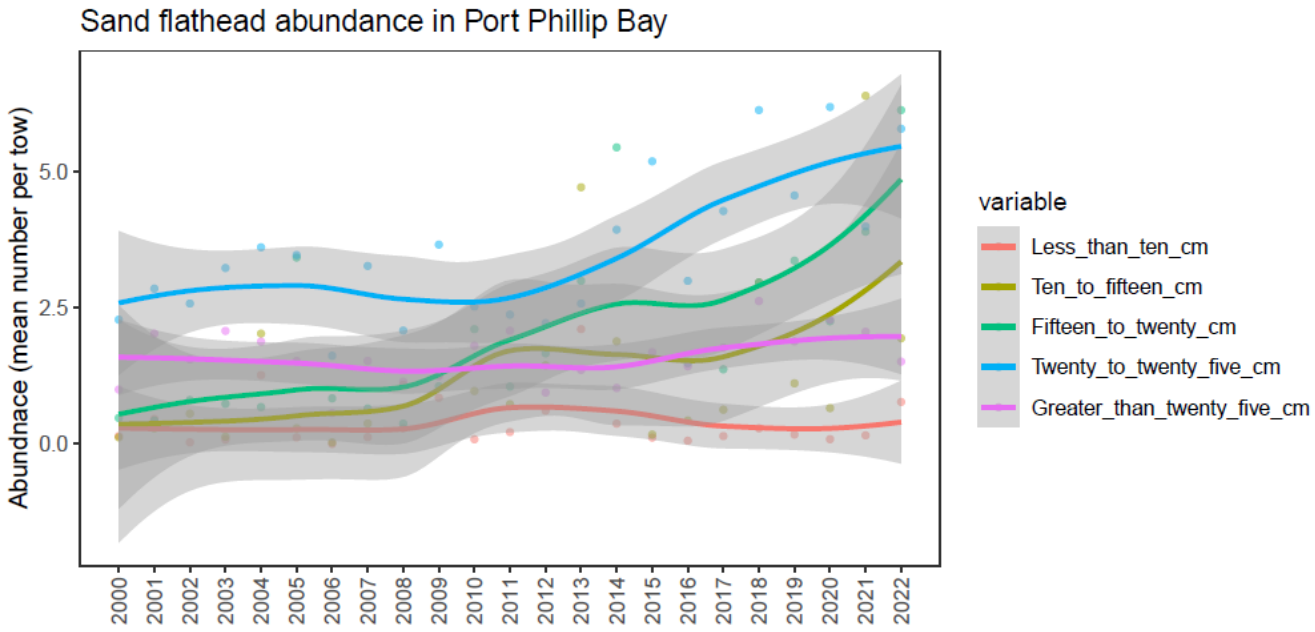

Figure 31 Abundance of sand flathead by size category from research net tows in Port Phillip Bay during 2000–2022. Trendlines are fitted using a GAM.

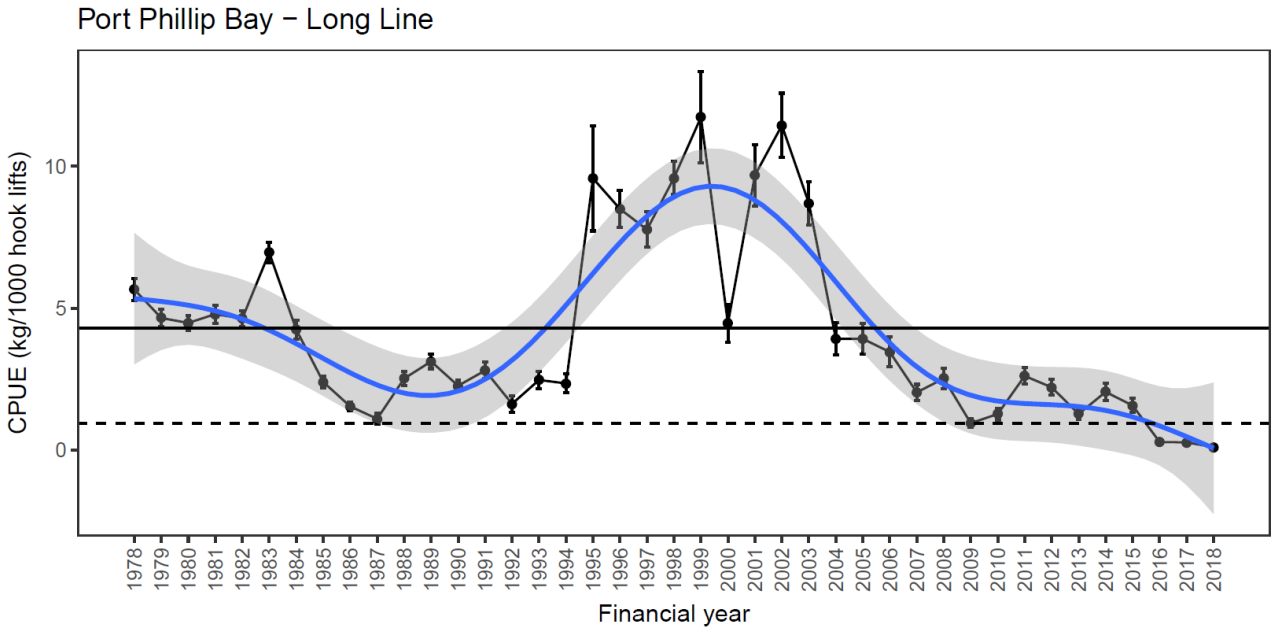

Figure 32 Nominal catch-per-unit-effort (CPUE) (±SE) (black line) for sand flathead by commercial long-line in Port Phillip Bay (PPB) during 1978–2018. Blue line is a generalised additive model (GAM) of the CPUE trend with the shaded grey area representing the 95% confidence interval of the GAM. Horizontal black line is the mean CPUE during the reference period (1985–2015) and the dashed black line is the minimum CPUE within the reference period.

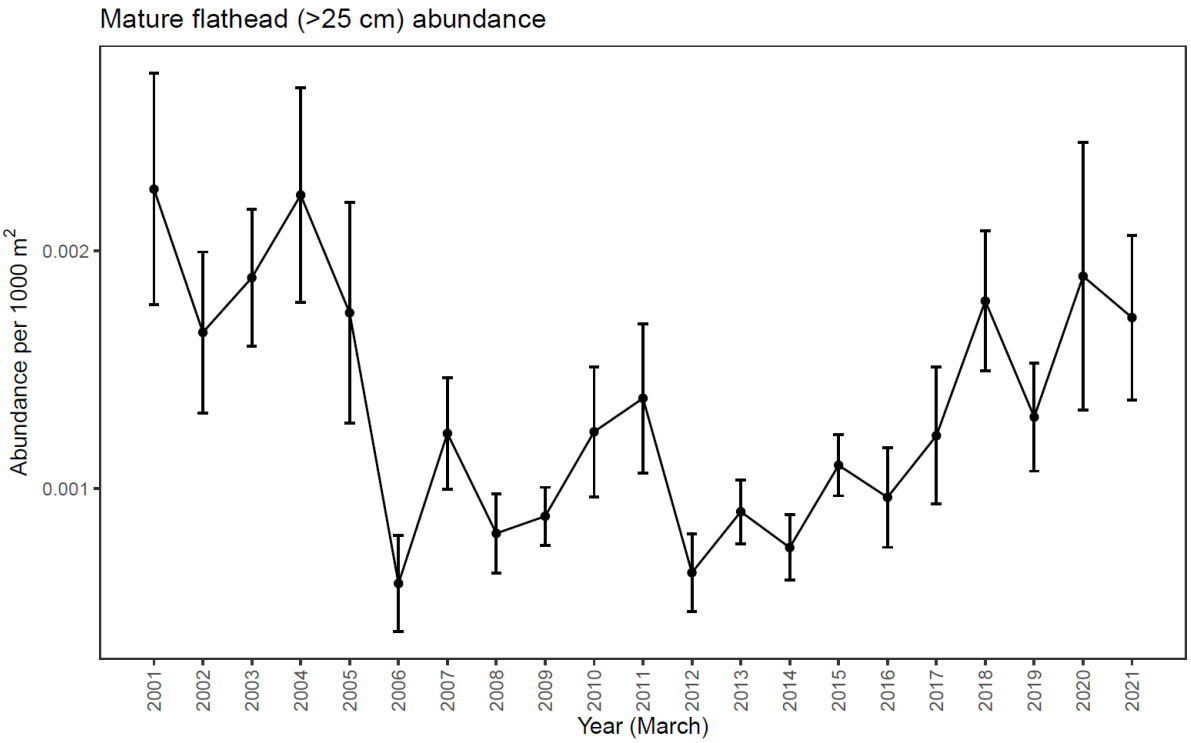

Figure 33 Port Phillip Bay mature (> 25cm) sand flathead abundance (mean ± SE) from 2001 – 2021.

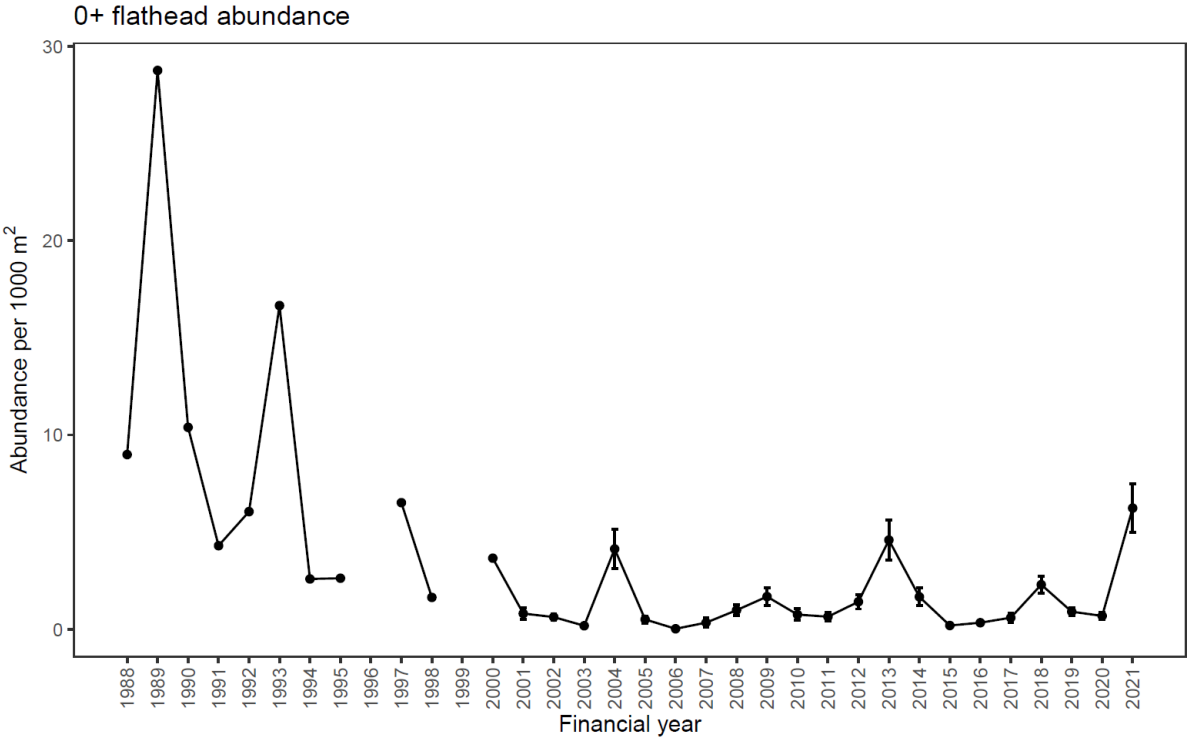

Figure 34 Port Phillip Bay sand flathead pre-recruit (0+ age) beam trawl survey catch rates (±SE) 1988–2021. Note: SE can only be calculated from 2000 onwards, data prior is based on extrapolation of beam trawl to earlier otter trawl data using a regression relationship from 11 years when the otter trawl and beam trawl surveys overlapped.