Snapper (*Chrysophrys auratus*)

Stock Structure and Biology

The Victorian snapper population is comprised of two stocks (Figure 1):

- *Western Victorian stock*: Wilsons Promontory (VIC) to Investigator Strait (SA)
- *Eastern Victorian stock*: Wilsons Promontory to the NSW border

Snapper can live to at least 39 years and grow to at least 110 cm total length (TL). Length at 50% maturity is 42 cm TL (legal minimum length, LML = 28 cm) which is reached at approximately 5 years of age. Snapper have high fecundity and a slow-moderate growth rate reaching the LML of 28 cm in 3-4 years.

The main spawning period is from November to January, with Port Phillip Bay the main spawning area responsible for most of the western stock replenishment. The spawning aggregations that occur in Corner Inlet-Nooramunga and inshore reefs near Lakes Entrance provide some local recruitment, but snapper from the western stock do emigrate into eastern Victoria (Figure 1).

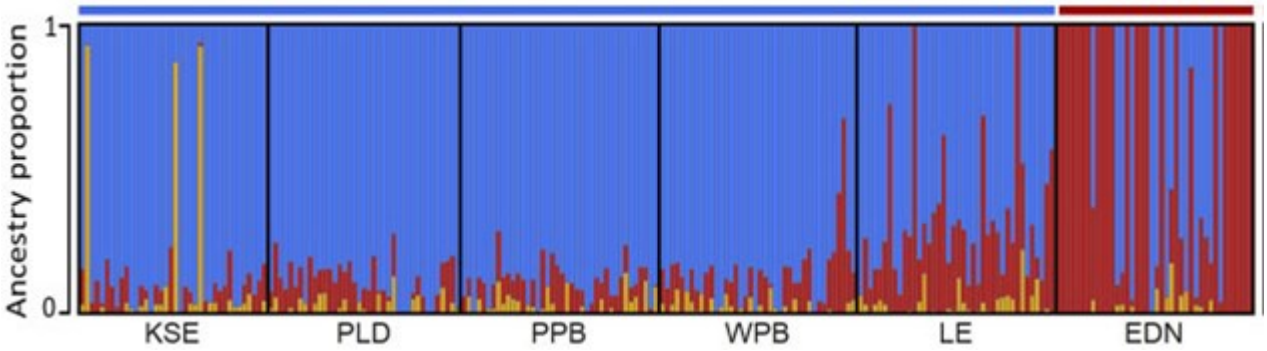


Figure 1 Heritage of snapper sampled from different regions of southeaster Australia. Each vertical line represents the ancestry of an individual fish. KSE = Kingston South-East, PLD = Portland, PPB = Port Phillip Bay, WPB = Western Port Bay, LE = Lakes Entrance, EDN = Eden. Yellow bars = South Australian stock heritage, blue bars = western Victorian stock heritage, red bars = East Australian stock heritage (Bertram et al. 2023).

Management/Assessment Unit

The western Victorian snapper stock supports recreational and commercial fisheries. The largest fisheries are in Port Phillip Bay (commercial and recreational) and Western Port (recreational), both of which are based on the western Victorian stock. The western stock fisheries account for most of the Victorian snapper harvest and receive most of the assessment and management attention. This report only considers the western stock because there is limited information to inform assessment of the eastern stock, despite its perceived growth as a recreational fishery over the last decade.

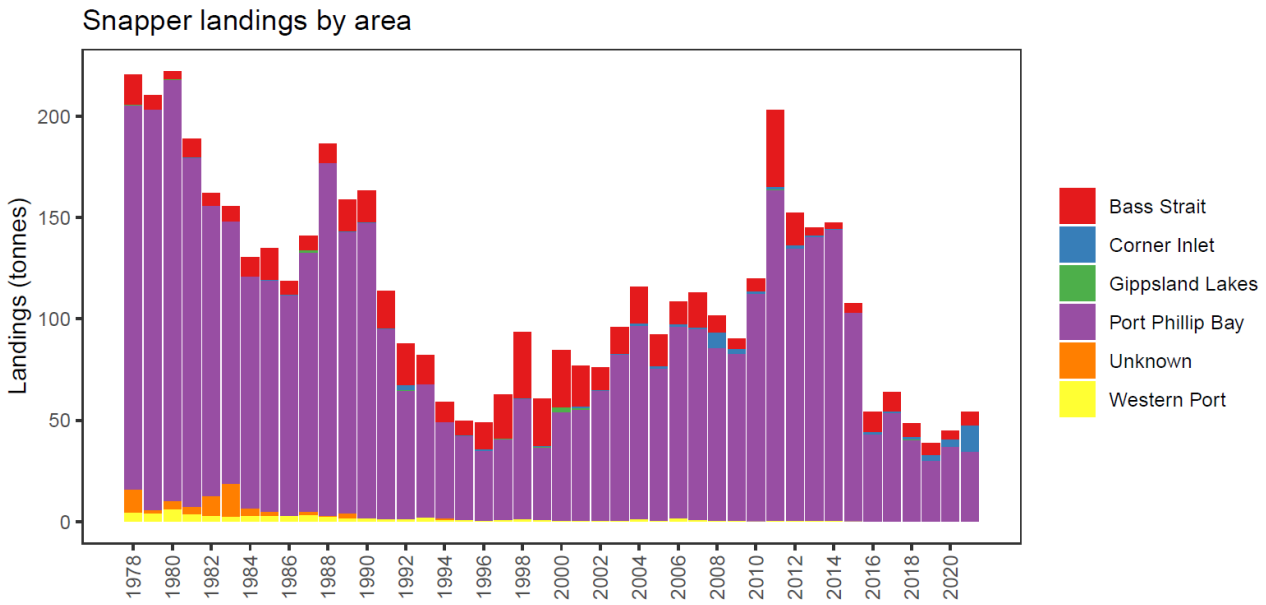


Figure 2 Snapper harvest by Victorian licenced commercial operators by fishing areas during financial years 1978/79–2021/22.

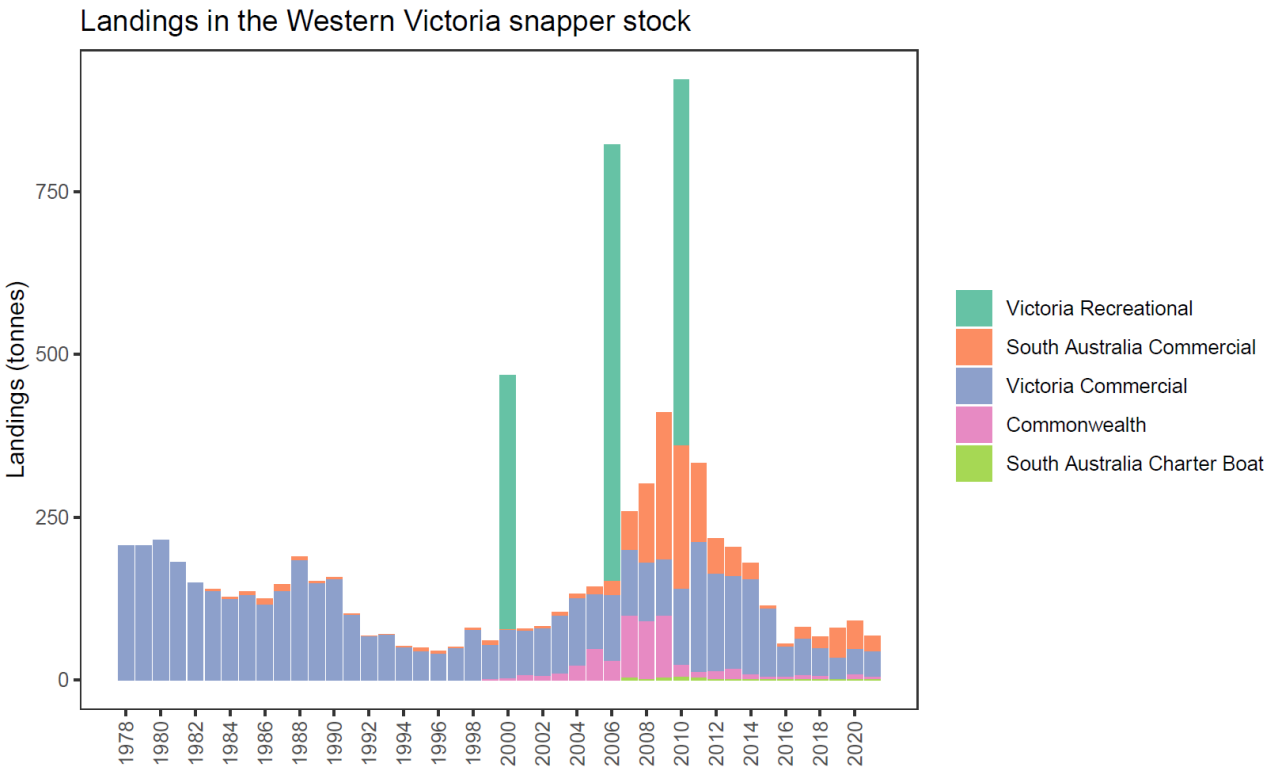


Figure 3 Total national catch of snapper including landings from the Western Victorian stock, financial years 1978–2021.

Assessment Summary

Western Victorian Stock

The status of the Western Victorian snapper stock and associated fisheries were evaluated using:

- Available harvest information for the commercial and recreational sectors
- Nominal and standardised CPUE for commercial long-line in Port Phillip Bay (reference period 2000-2015)

- Nominal and standardised CPUE for the recreational fishery from annual creel surveys in Port Phillip Bay and Western Port for adult (October-December) and juvenile/sub-adult (January-April) snapper (reference period 2002–2015)
- Length composition of long-line fishery catches in Port Phillip Bay
- Length composition of recreational fishery catches in Port Phillip Bay and Western Port from creel survey samples and diary anglers
- Snapper pre-recruit (0+ age) abundance from fishery independent trawl surveys in Port Phillip Bay.

This assessment found:

- *Fishing pressure* – most of the commercial harvests are from Port Phillip Bay and have dropped considerably from ~150 t in 2010–11, to recent harvests of less than 50 t/y being among the lowest recorded since 1978 (Figure 2). Since 2009/10 harvests by non-Victorian licensed operators from the western stock region have also declined to very low levels (Figure 3). Commercial effort using haul seine ceased as of 1 Apr 2022 due to removal of netting from Port Phillip Bay and long-line effort has reduced substantially in recent years due to a reduction of licences (only 8 remain) and the introduction of catch caps (Appendix 2). There is no recent information on recreational harvest or effort.
- *Biomass* – Standardised CPUE of adult snapper taken by the commercial long-line fishery and recreational anglers (October-December surveys) in Port Phillip Bay have decreased since their peaks a decade ago (Figure 4 and Figure 5). Standardised CPUE for recreational anglers in Port Phillip Bay for the October-December period in 2021 was just below the reference period average, up slightly from 2020 (Figure 5).The decrease in the recreational catch rate in Port Phillip Bay was rapid from 2013 to 2014 but has since stabilised and remained above the lowest point observed during the reference period, however, it is currently below the reference period average for standardised CPUE. The recreational CPUE for January-May is indicative of the biomass of smaller juveniles and sub-adults (pinkies) and is typically highly variable across years due to the passage of weaker and stronger cohorts through the fishery (Figure 6). Nevertheless, the long-term trend among pinkie snapper in Port Phillip Bay is increasing and in 2021 was above the reference line (Figure 6). Western Port recreational snapper CPUE showed slightly different patterns with the larger adults (Oct-Dec) having declined from a peak in the mid-2000s and now showing an upswing from a low point in 2017 to lie just on the reference line in 2020, before falling again in 2021 to approximately half way between the reference period and minimum standardised CPUE (Figure 7). Pinkies in contrast, showed a decade of shallow decline which began levelling out between the standardised minimum and the reference line before sharply increasing in 2021/22 (Figure 8), bearing in mind the variability in abundance of these juveniles – sub-adults. In this instance, standardised CPUE has increased over the three years to 2021. Forecasts based on the recreational creel in Port Phillip Bay indicate increased abundance is expected for the 5-year period after 2023 (Figure 9, Figure 10, Figure 11 and Figure 12). However, the median length for the October-December period has been lower since 2014 for the Port Phillip Bay recreational fishery. This is due to lower numbers of larger fish being caught since 2013 by the surveyed anglers but is also influenced by new cohorts entering the fishery thereby reducing the overall average (Figure 10a). The diary angler length compositions showed that the upper range of the length compositions has been consistent at approximately 100 cm since 2013 (Figure 10b).
- *Recruitment* – Recruitment of 0+ age snapper was low from 2015–2017 after moderate recruitments in 2014 and 2015 (Figure 11). In 2018, recruitment of 0+ age snapper was the highest recorded since trawl surveys began in 1993 (Figure 11). It then fell again for the three years 2019–2021 followed by a sizeble peak in the most recent survey in 2022 (Figure 11). With two very large cohorts to enter the fishery in coming years, it is expected that the overall biomass of the stock will increase.

Recreational catch

Recreational harvest in 2000/01, 2006/07 and 2009/10 for the Victorian region of the western stock were estimated at approximately 389, 670 and 561 t respectively (Henry and Lyle 2003; Ryan et al. 2009; VFA unpublished data). For the South Australian region of the western stock, recreational harvests were estimated at between 10–20 t for the three most recent surveys 2000/01, 2007/08, 2013/14 (Fowler et al. 2016).

Stock status summary: Adult biomass for the Western Victorian snapper stock has been depleting since a recent peak in the late 2000s – early 2010s. Nevertheless, fishery performance remains generally good (CPUE is close to the reference period average) for the long-line fishery where nominal CPUE has not declined as much as for the recreational fisheries, likely due to the high skill and effectiveness of the small number of long-line fishers who have been operating since 2010. The recreational fishery for adult snapper in Port Phillip Bay is considered sustainable at its current level,

appearing to have stabilised since 2014, but a declining trend in Western Port persists. The decline in Western Port is thought to be related to local dynamics rather than deterioration in overall stock status. Recent strong recruitment with two high peaks observed during the past 5 years is expected to reverse any declining biomass trends and drive a rebuilding of adult biomass over the next 5–10 years with increases in sub-adult catch rates from January to May already apparent in both Port Phillip Bay and Western Port. Length compositions are not showing signs of truncation, and commercial fishing pressure has reduced substantially in recent years due to the Port Phillip Bay buy-outs and reduced landings by South Australian and Commonwealth operators.

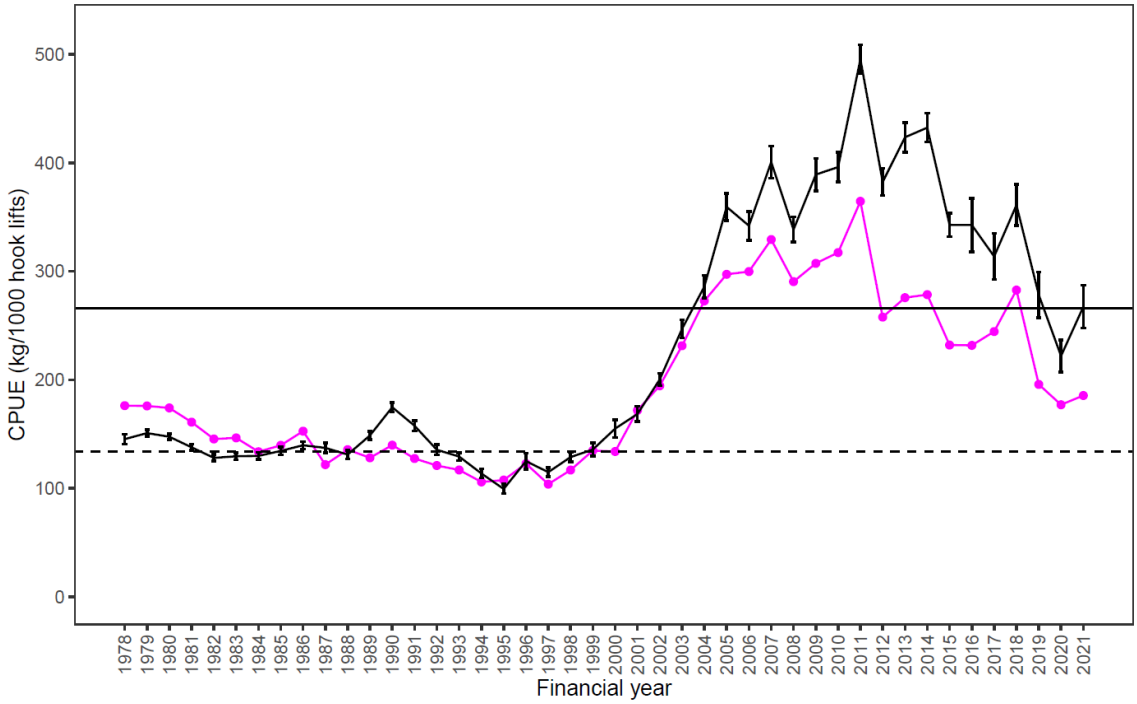


Figure 4 Catch-per-unit effort (CPUE) of snapper by commercial long-line fishers in Port Phillip Bay from 1978–2021 financial years. Black line is nominal CPUE (±SE), and magenta line is standardised CPUE.

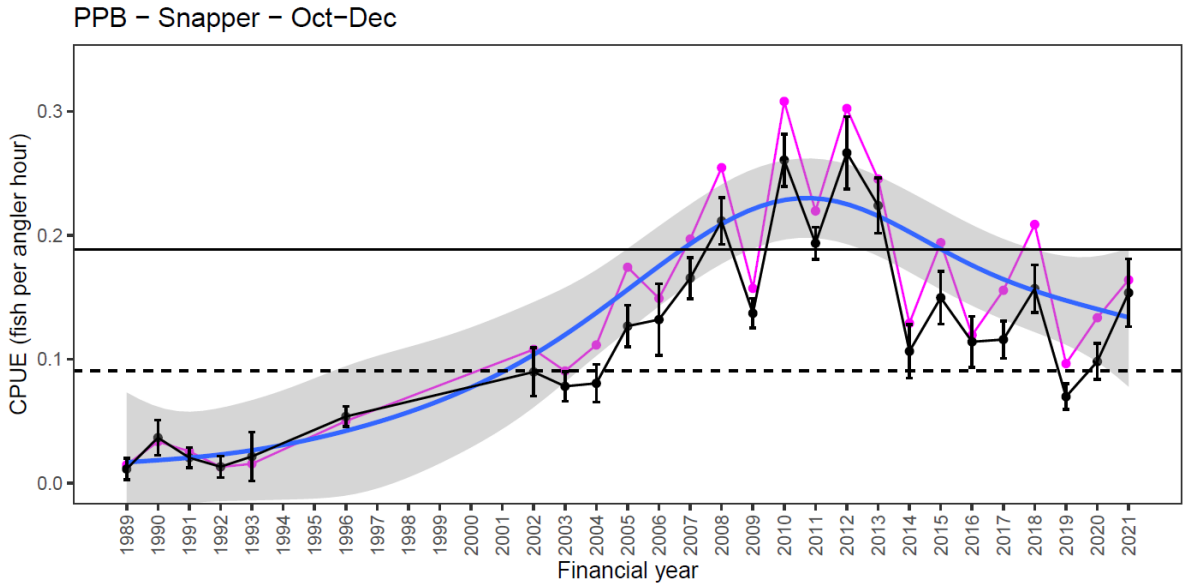


Figure 5 Catch-per-unit effort (CPUE) of snapper by recreational anglers interviewed in creel surveys undertaken in Port Phillip Bay between October – December during 1997/98–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model GAM of the standardised 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 (2002–2015) and the dashed black line is the minimum standardised CPUE within the reference period.

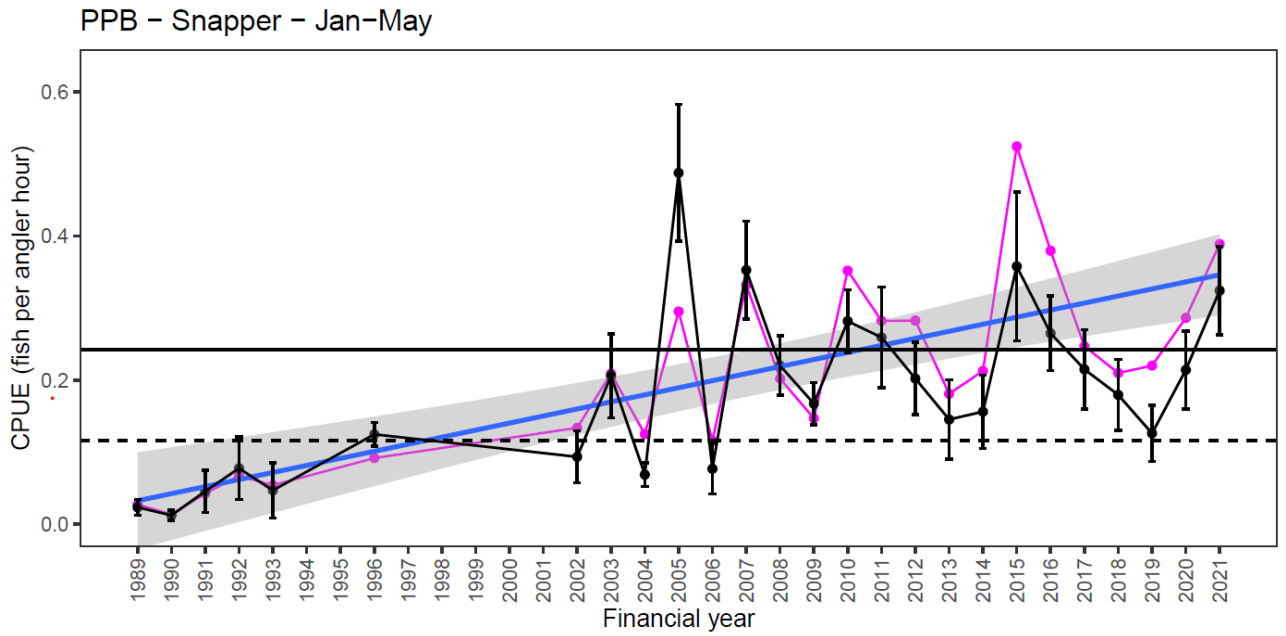


Figure 6 Catch-per-unit effort (CPUE) of snapper by recreational anglers interviewed in creel surveys undertaken in Port Phillip Bay (PPB) between January – May during 1997/98–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a GAM of the standardised trend with the shaded grey area representing the 95% confidence interval of the generalised additive model GAM. Horizontal black line is the mean standardised CPUE during the reference period and the dashed black line is the minimum standardised CPUE within the reference period.

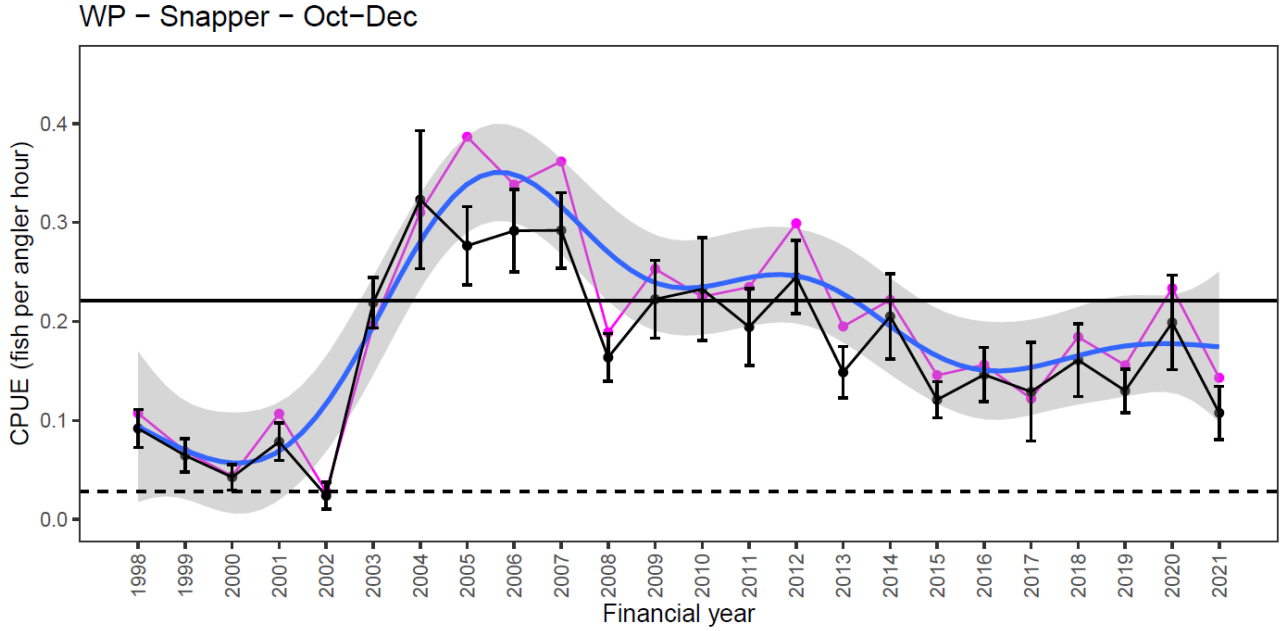


Figure 7 Catch-per-unit effort (CPUE) of snapper by recreational anglers interviewed in creel surveys undertaken in Western Port (WP) October – December during 1997/98–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model GAM of the standardised 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 and the dashed black line is the minimum standardised CPUE within the reference period.

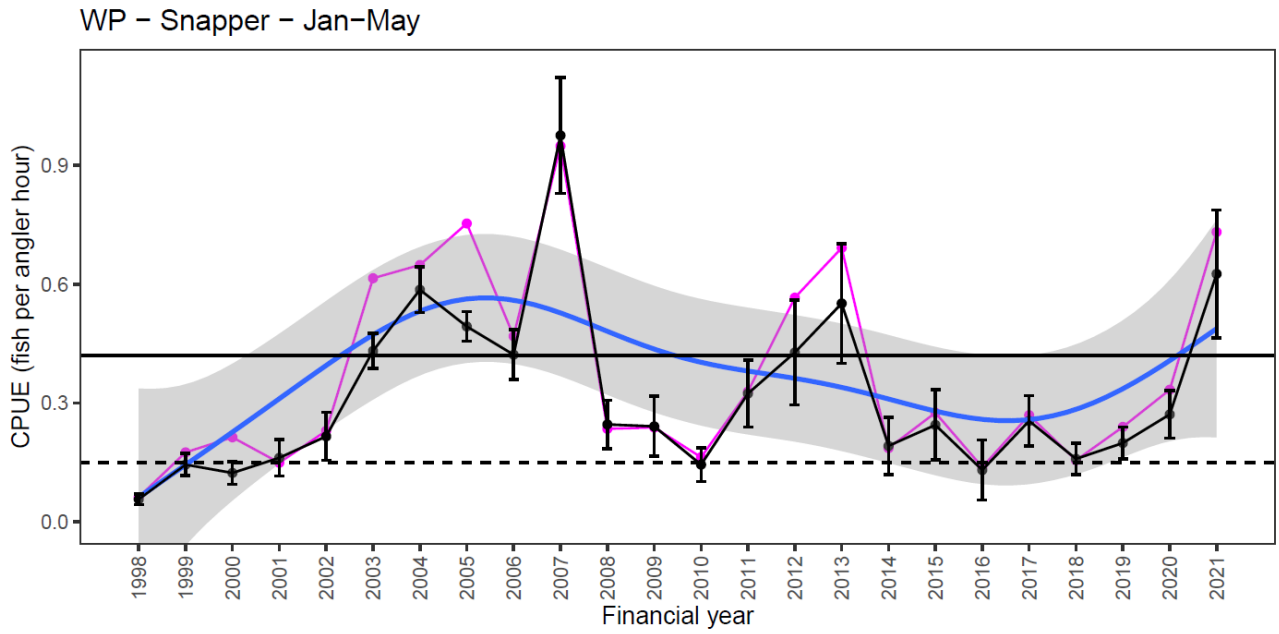


Figure 8 Catch-per-unit effort (CPUE) of snapper by recreational anglers interviewed in creel surveys undertaken in Western Port (WP) January – May during 1997/98–2021/22 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model GAM of the standardised 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 and the dashed black line is the minimum standardised CPUE within the reference period.

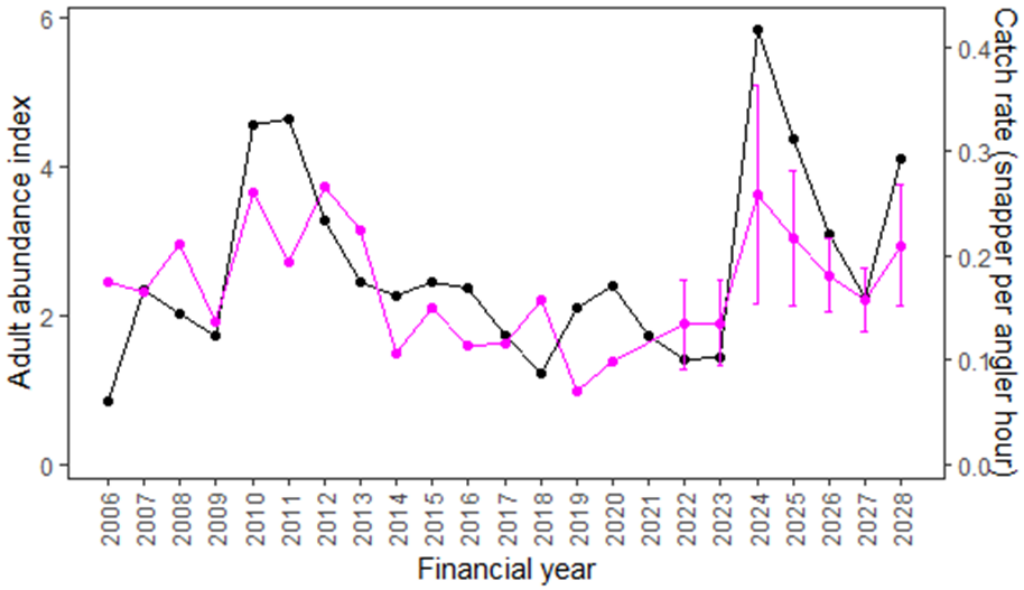


Figure 9 Port Phillip Bay snapper creel observed (2006–2021) and forecast CPUE (pink) and abundance index (black) over the same observed and forecasted (2022–2028) periods.

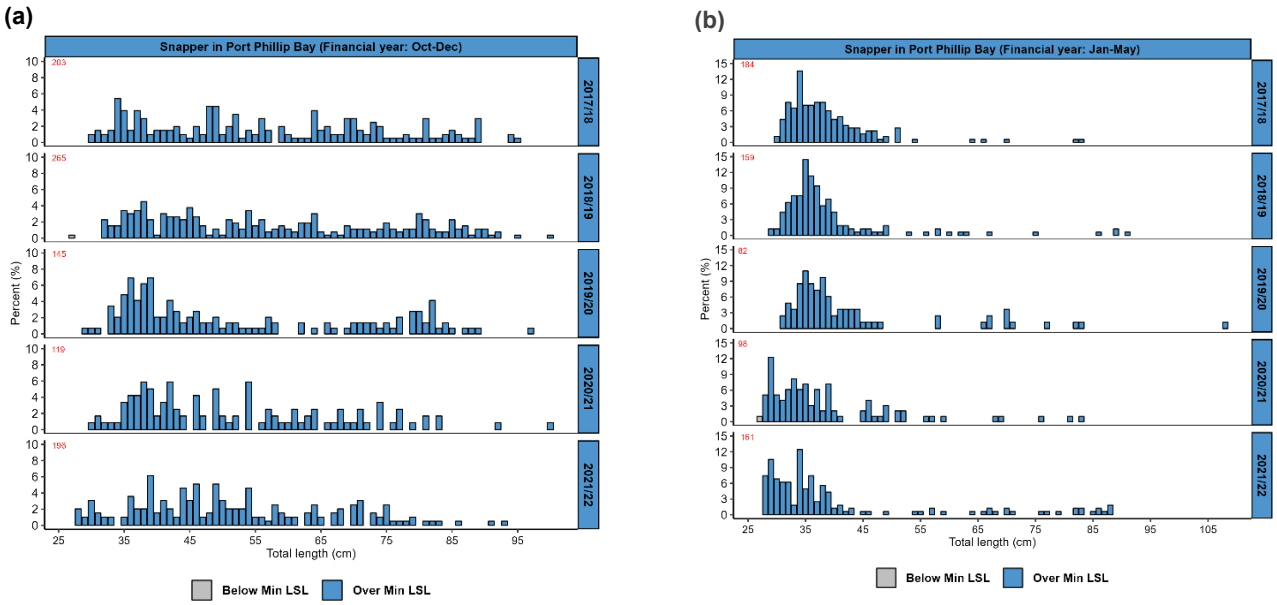


Figure 10 Frequency histograms of Port Phillip Bay recreational fishery snapper creel survey length composition (a) Oct-Dec, (b) Jan-Apr. Red numbers indicate numbers of fish measured. LSL = legal size limit.

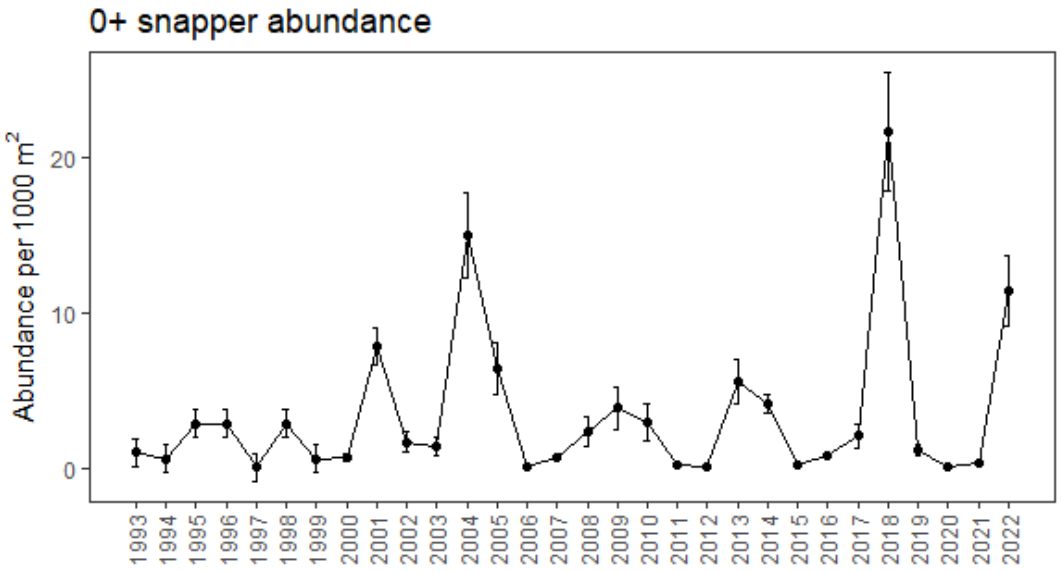
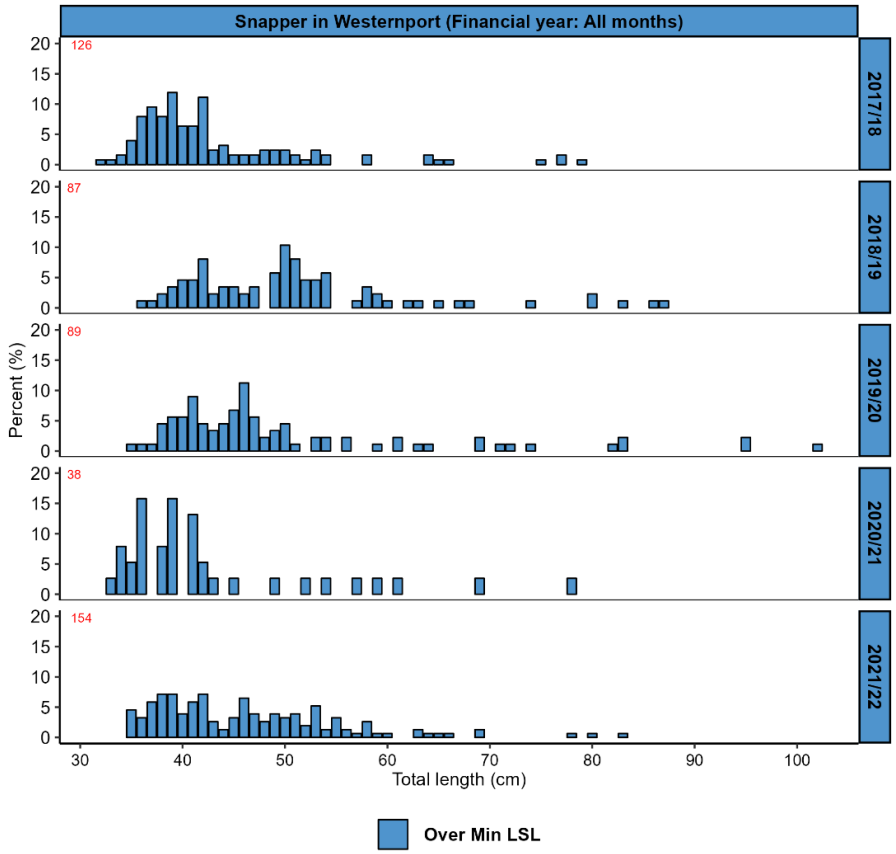


Figure 11 Port Phillip Bay snapper pre-recruit (0+ age) trawl survey catch rates (±SE) 1993–2022. Note: SE can only be calculated from 2000 onwards, data prior is based on extrapolation of beam trawl to earlier otter trawl data using a regression relationship from 11 years when the otter trawl and beam trawl surveys overlapped.

(a)



(b)

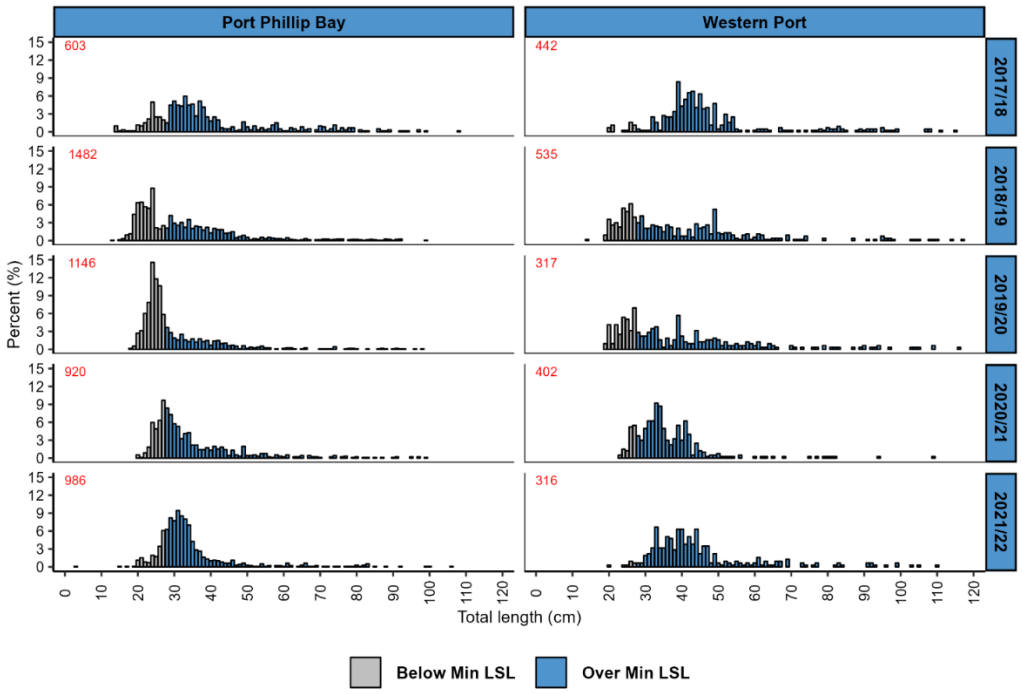


Figure 12 Frequency histograms of Western Port recreational snapper length composition (a) creel surveys all months, (b) diary angler all months (incl. PPB for comp.), fiscal years 2017/18–2021/22. Red numbers are numbers sampled. LSL= legal size limit.

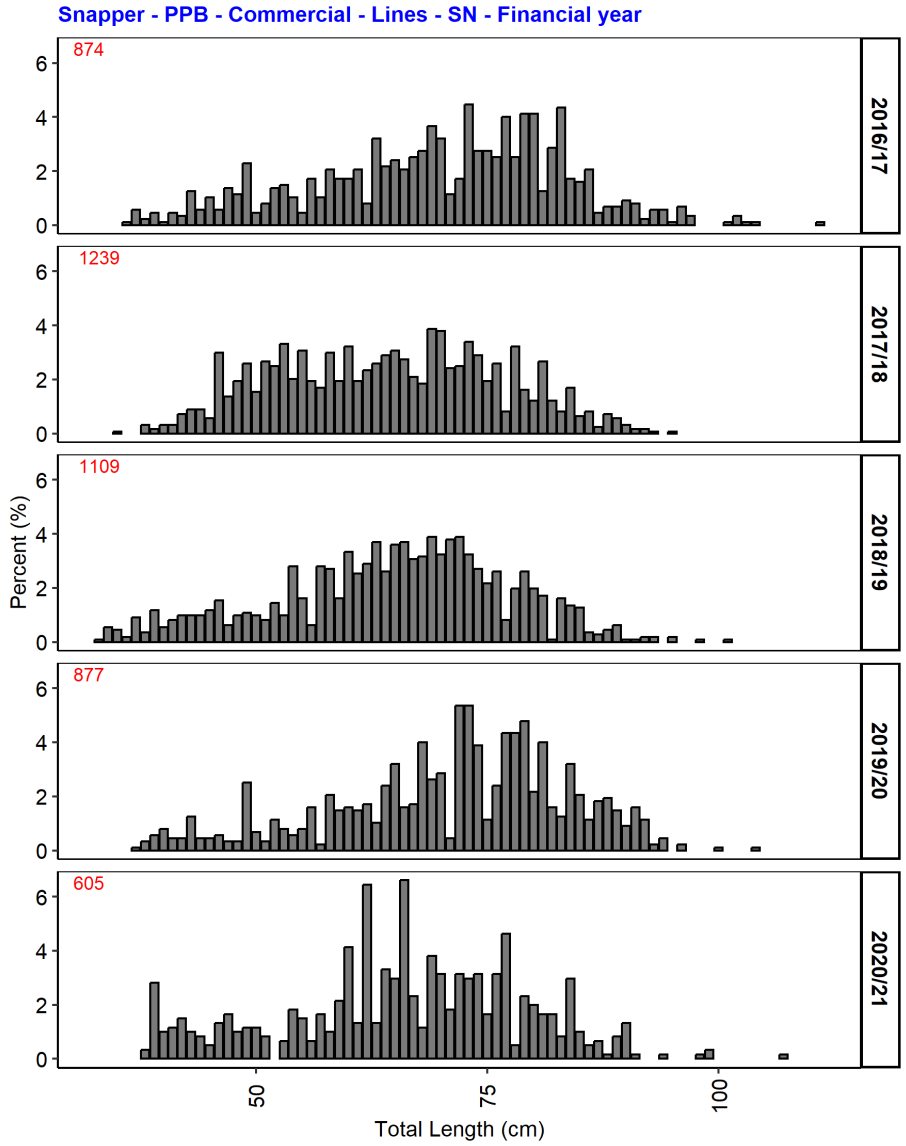


Figure 13 Frequency histograms of Port Phillip Bay line caught commercial snapper length composition (%) for fiscal years 2016/17–20120/21. Red numbers are numbers sampled.

Eastern Victorian snapper stock

There are no suitable proxy measures for stock biomass or pre-recruit abundance of the eastern Victorian snapper stock. Commercial catch is mostly taken by Commonwealth operators and has decreased since a peak in 2011/12 in response to Commonwealth industry-imposed rules to limit snapper harvest (Figure 14). There are no recent data on recreational harvest or any data on effort trends for the eastern Victorian stock. Recreational catch estimates in 2000/01 and 2006/07 indicated catches were in the order of around 30 t/year (Henry and Lyle 2003; Ryan et al. 2009), but anectdotal information suggests that increased fishing pressure on spawning aggregations close to Lakes Entrance is an emerging issue among local stakeholders.

Stock status summary: Recent recognition of the eastern Victorian stock as a stand-alone stock for SAFS reporting and a lack of information to make any confident judgement of status, along with reports of increased fishing pressure on spawning aggregations by local stakeholders, imply that the current status of eastern Victorian snapper stock is uncertain.

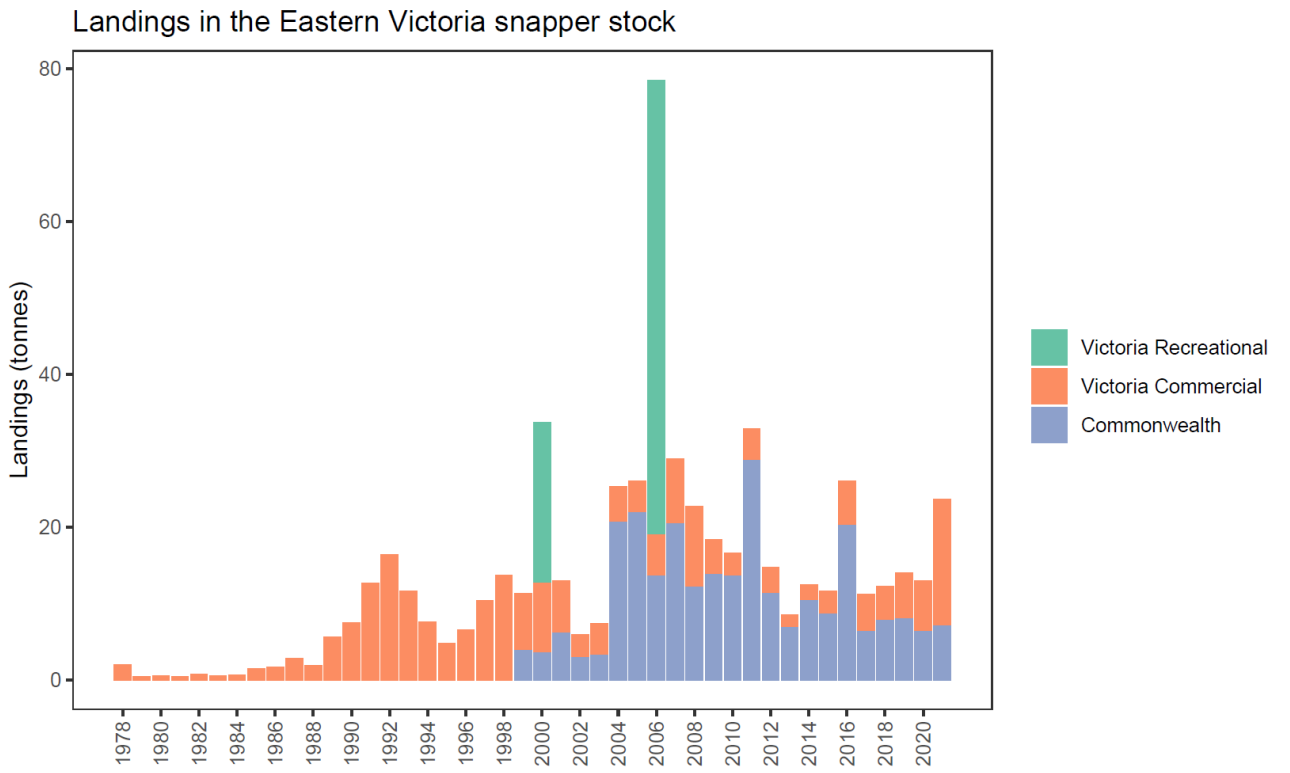


Figure 14 Total catch of snapper from the Eastern Victoria stock. fiscal years 1978–2021.