Gummy Shark (*Mustelus antarcticus*)

Stock Structure and Biology

Gummy shark populations in Victorian waters are a component of a single biological stock for south-eastern Australia. Gummy shark can live to 16 years and grow to over 180 cm total length (TL) (25 kg total body mass). Maturity (50 percent) for females is at 110–125 cm TL and for males is at 95–115 cm TL. Gummy shark have low fecundity (an average of 14 pups per two year breeding cycle) and an 11 to 12 month gestation period. The growth rate of male gummy shark is higher than for females. The peak parturition period is November to December with shallow coastal waters, including sheltered bays, the preferred pupping habitat.

Management/Assessment Unit

The gummy shark populations in Victorian waters support commercial gillnet and hook fisheries as well as recreational fisheries in Port Phillip Bay, Western Port, Corner Inlet and other inshore coastal waters. The Commonwealth Southern and Eastern Scalefish and Shark Fishery harvests by far the largest component of the gummy shark catch and is managed by the Commonwealth of Australia using a harvest strategy that includes age structured population dynamic model to inform quota setting decisions. This report considers the Victorian gummy shark population in Victorian waters as a state-wide stock.

Assessment Summary

For this assessment, the status of the state-wide Gummy Shark population was evaluated using:

- Commonwealth assessment of total commercial gummy shark catch and modelled gummy shark pup production for the Southern and Eastern Scalefish and Shark Fishery,
- Nominal CPUE trends for the Victorian commercial Gummy Shark fishery from Corner Inlet-Nooramunga using mesh nets (reference period 1985–2015) and Port Phillip Bay using longline (reference period 1985–2015),
- Standardised recreational CPUE from creel survey in the Western Port recreational fishery (reference period 1998–2015).
- Time series of commercial catch and recreational fishery size composition data.

This assessment found:

- *Fishing pressure* – Gummy shark landings were high (700–800 t) in Victoria from 1978–1997, after which trip limits were introduced for most state fisheries and the Commonwealth formally created the Southern Shark Fishery (now a component of the South East Scalefish and Shark Fishery; SESSF) (Figure 69). This is reflected by the large decline in Bass Strait mesh net effort post-1998 (see Appendix 2). In recent years, fishing effort using the gears that capture the majority of gummy shark in Victorian state fisheries have both increased (Corner Inlet-Nooramunga mesh net) and decreased (Port Phillip Bay longline), with the latter a result of license buy-outs, but the former not necessarily related to targeting of Gummy Shark.

- *Biomass* – Gummy shark long line CPUE in Port Phillip Bay has been among historic highs in recent years in Port Phillip Bay and is well above the reference period average (Figure 70), potentially as a result of targeting this species due to the decreasing abundance of snapper (see snapper section). However, CPUE has declined somewhat in the last two years, which could be due to the introduction of a mixed species total allowable catch for the remaining fishers in Port Phillip Bay who may discard gummy shark in favour of the more valuable snapper. Conversely, CPUE has been declining in Corner Inlet since about 2006, dropping below the reference period average in 2018/19 where it has remained, but has not fallen below the reference period minimum (Figure 71). It is difficult to determine whether this represents decreased gummy shark availability in the system as the same gear is used to target a range of species so CPUE can be unrelated to biomass. Recreational catch rates in Corner Inlet have been consistent over a five year period, with a slight decline in 2021/22 (Figure 72) Recreational catch rates in Western Port have been variable, showing no long term trend, throughout the time period analysed (Figure 73) and there has been a relatively consistent size composition of the catch (Figure 74) indicating that recruitment has been ongoing and fishing mortality is not high enough to decrease the proportion of larger fish in the population.

Stock status summary: The Gummy Shark fishery component of the SESSF comprises multiple populations with varying reproductive characteristics (Walker, 2007), however, the Victorian fishery comprises of catches from a single biological stock (i.e. Bass Strait), and this stock is modelled independently in formal quantitative stock assessments (Tuck, 2018). Tuck (2018) found that pup production of the Bass Strait stock was above the 48% of unfished levels (harvest strategy limit) and therefore sustainable at current catches. This assessment also projected future sustainable catches and the landings from the Commonwealth and state fisheries have remained below these projections. The information available in the current assessment reinforces that the gummy shark population is performing adequately with recreational CPUE in Western Port and commercial longline CPUE in Port Phillip Bay increasing through time in line with the Commonwealth stock assessment. Although trends in commercial mesh net CPUE in Corner Inlet-Nooramunga were contrary to the positive trends elsewhere, gummy shark represent a relatively minor component of this fishery, and the landings are minimal within the context of the stock wide landings, and although it could represent localised depletion, it is not considered likely to represent the abundance of the broader stock. Based on the multiple lines of evidence available it can be concluded that the Victorian gummy shark population is sustainable.

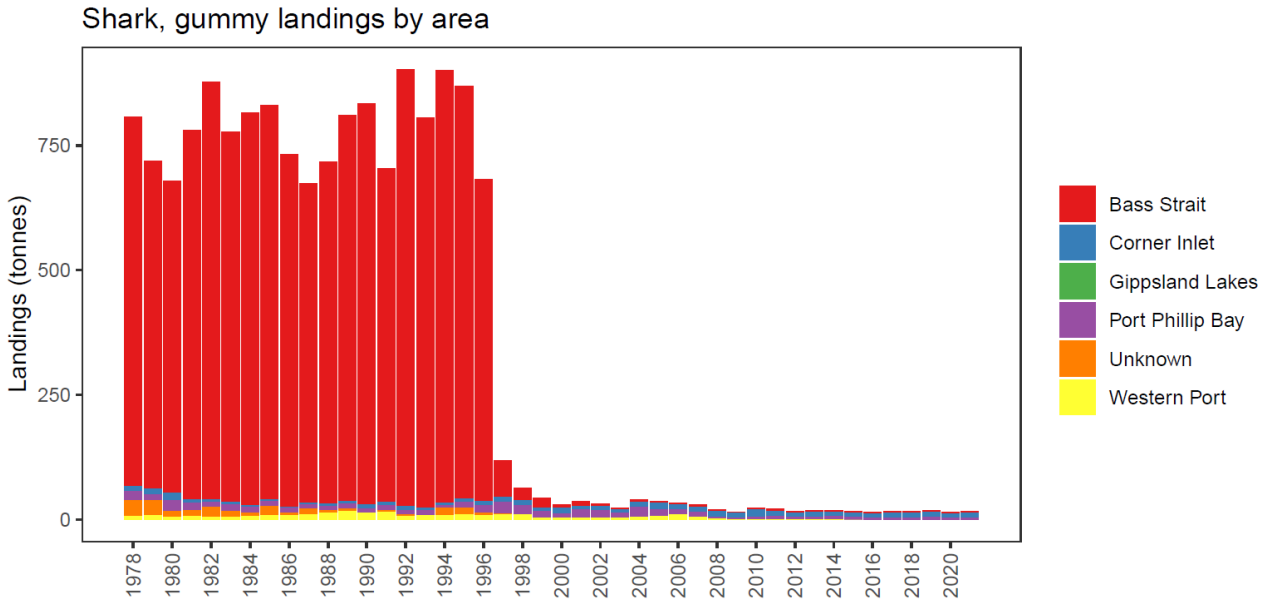

Figure 69 Total catch from the Victorian commercial Gummy Shark fishery by area by fiscal year during 1978–2020. Note from 1997 gummy shark in coastal waters transferred to Commonwealth management. Since 1997 most Gummy Shark harvested adjacent to Victoria were taken under Commonwealth issued licences and are not represented in this figure.

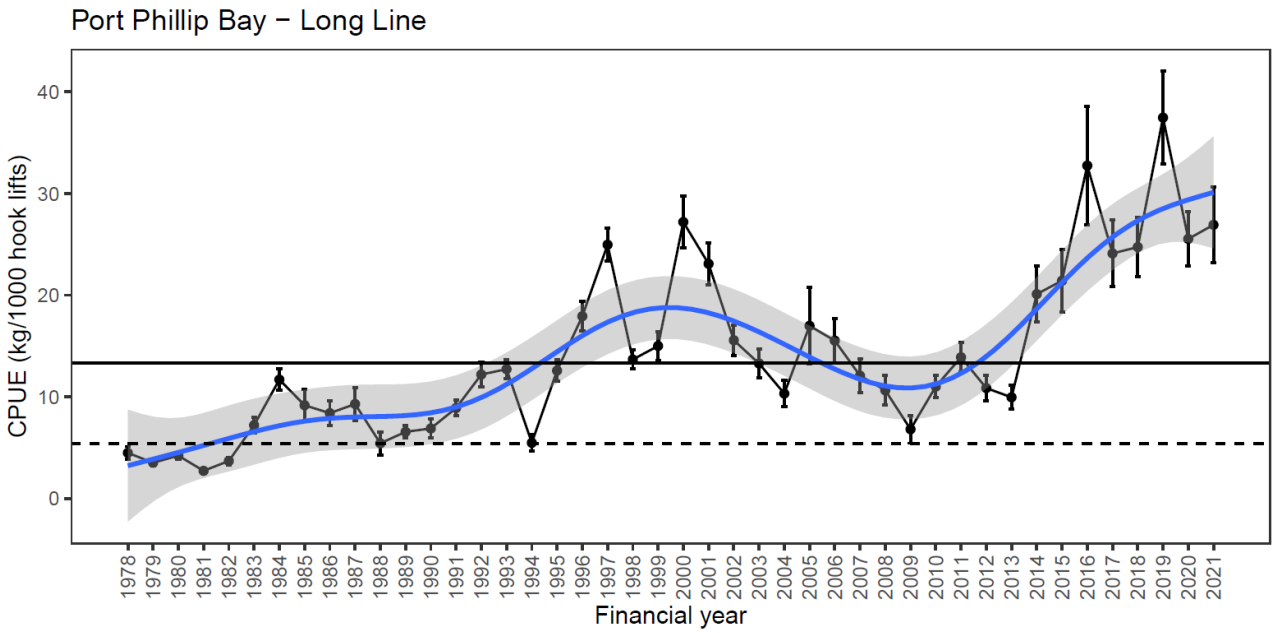

Figure 70 Nominal catch-per-unit-effort (CPUE) (±SE) of gummy shark by commercial longline fishers in Port Phillip Bay (1998–2021). Horizontal black line is the mean nominal CPUE during the reference period (1985–2015) and the dashed black line is the minimum standardised CPUE within the reference period. 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.

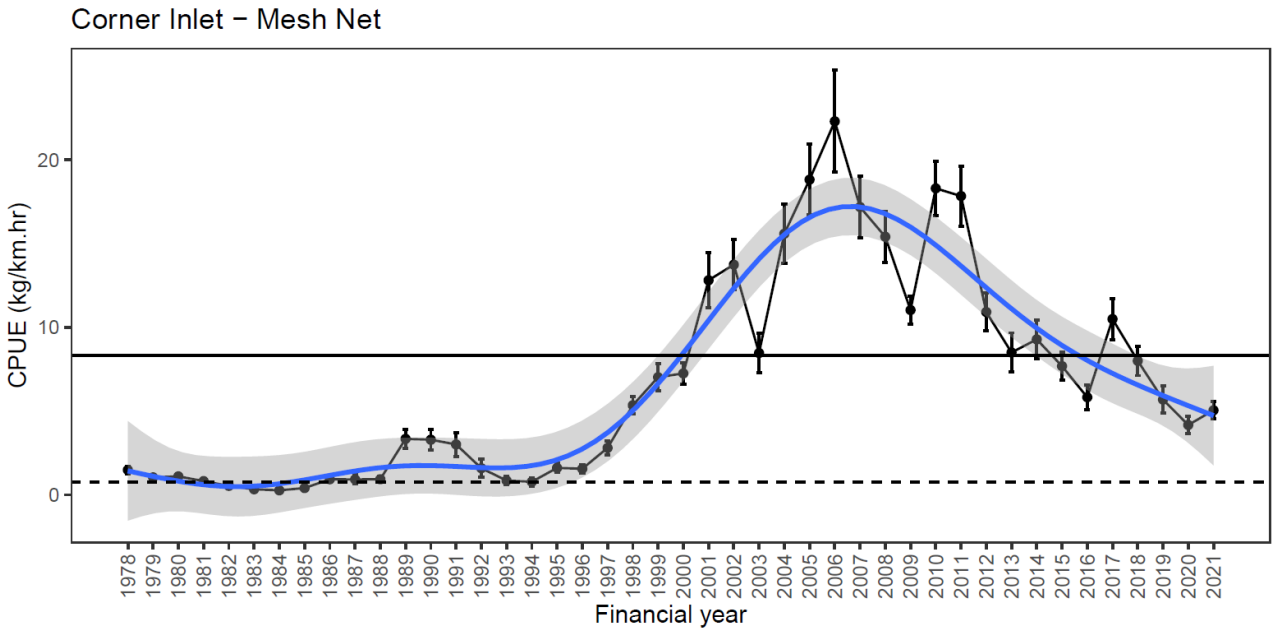

Figure 71 Nominal catch-per-unit-effort (CPUE) (±SE) of gummy shark by commercial mesh net for Corner Inlet (1998–2021). Horizontal black line is the mean nominal CPUE during the reference period (1985–2015) and the dashed black line is the minimum standardised CPUE within the reference period. Blue line is a generalised additive model (GAM) of the CPUE trend with the shaded grey area representing the 95% confidence interval of the GAM. Note: data prior to 1998 are not presented as catch rates were extremely low suggesting a lack of targeting gummy shark in this region of the fishery.

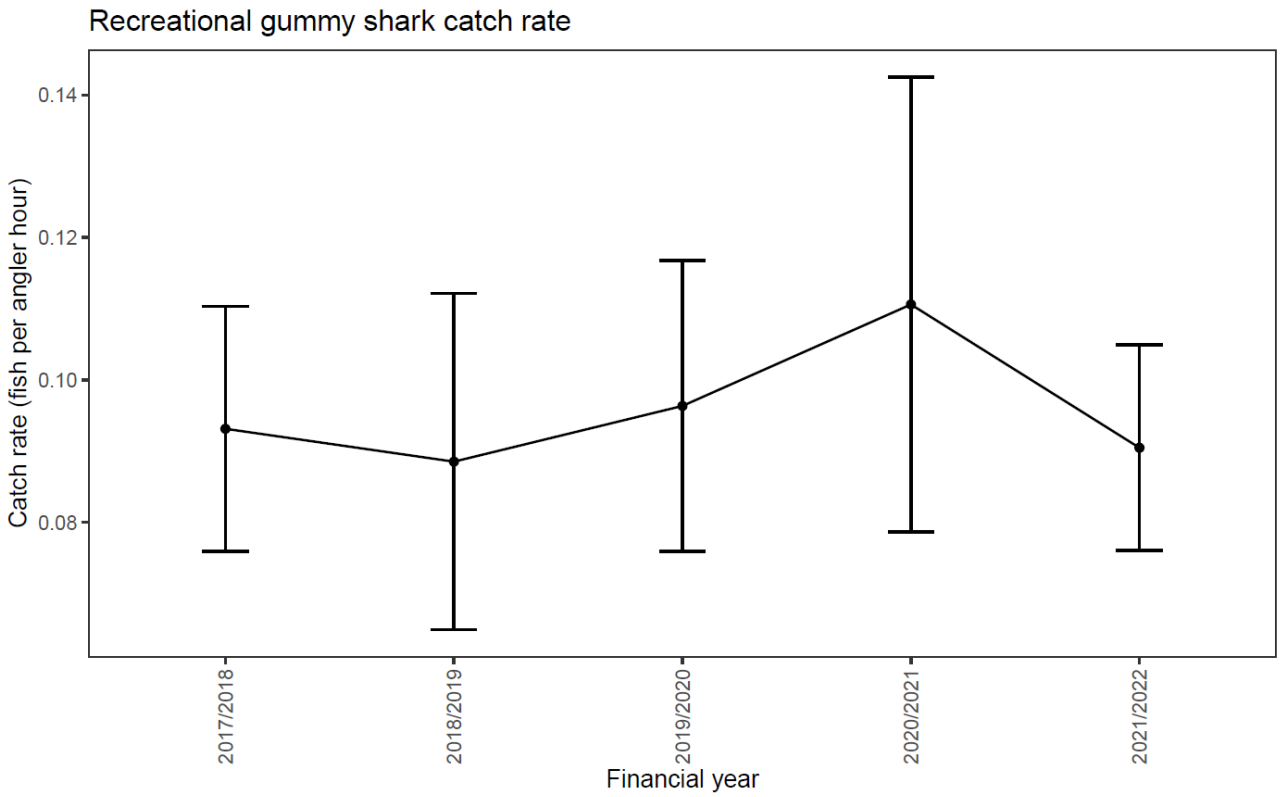

Figure 72 Catch-per-unit-effort (CPUE) of gummy shark by recreational anglers interviewed in creel surveys undertaken in Corner Inlet (CI) from 2017/18–2021/22 financial years.

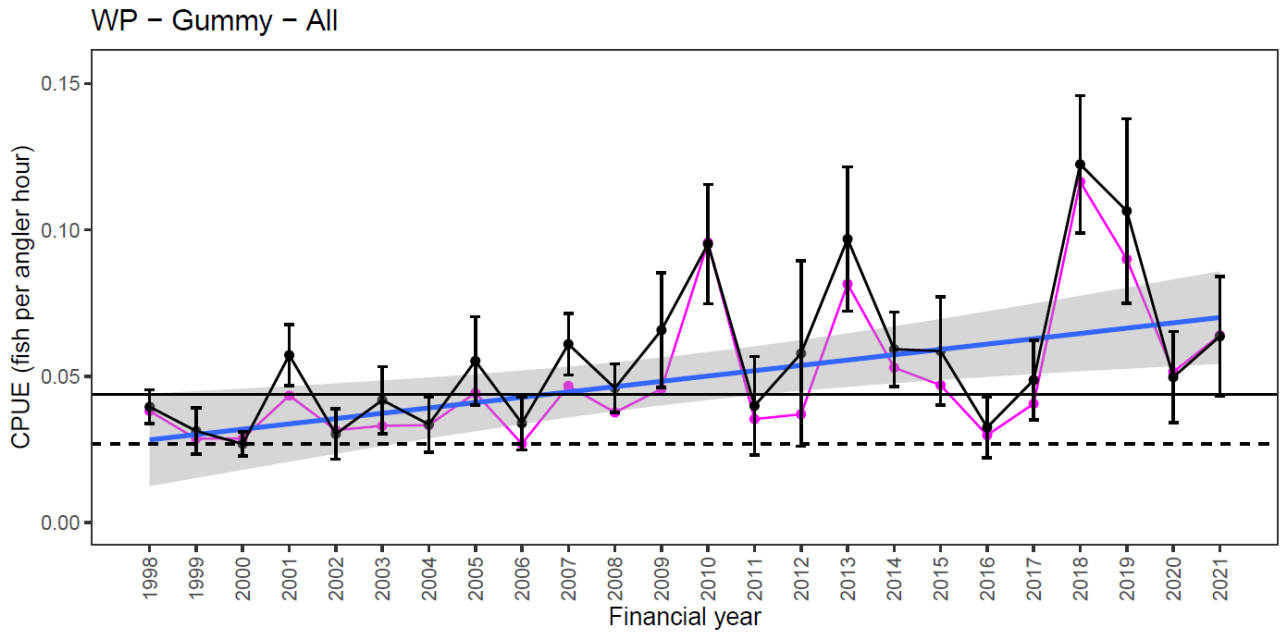

Figure 73 Catch-per-unit-effort (CPUE) of gummy shark by recreational anglers interviewed in creel surveys undertaken in Western Port (WP) from 1998–2021 financial years. Black line is nominal CPUE (±SE), magenta line is standardised CPUE, blue line is a generalised additive model (GAM) of the standardised 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 and the dashed black line is the minimum standardised CPUE within the reference period.

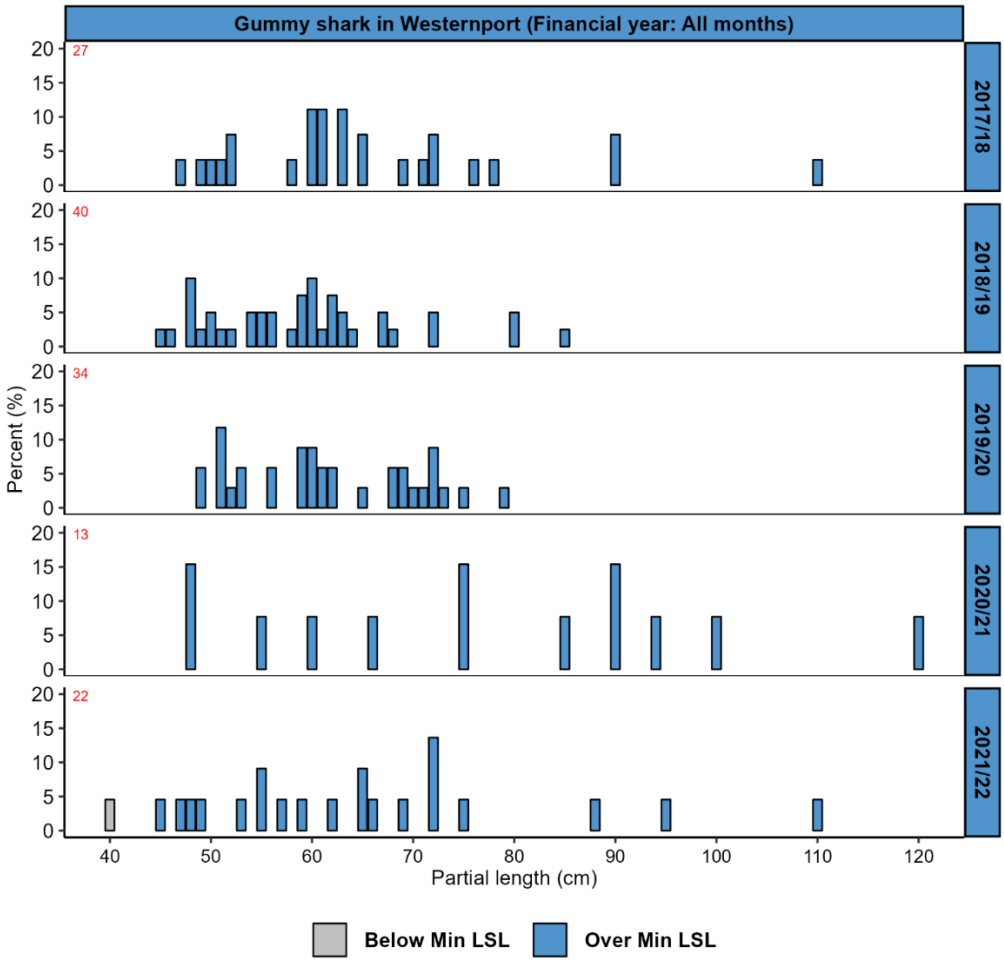

Figure 74 Frequency histograms of Corner Inlet length composition of gummy shark by fiscal years 2017/18 to 2021/22.