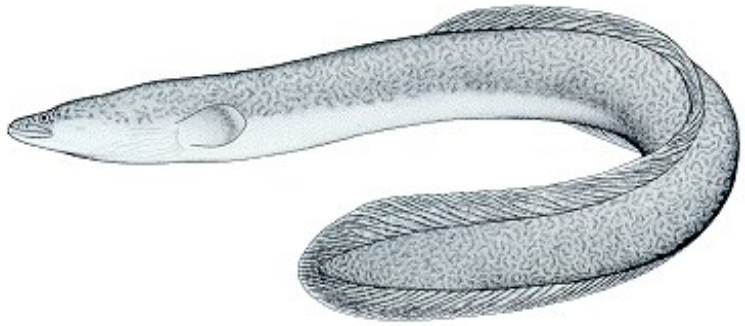
Longfin Eel (*Anguilla reinhardtii*)



Stock Structure and Biology

Longfin Eel (*Anguilla australis*) occur in coastal streams from the Jardine River in northern Queensland to rivers east of Melbourne in Victoria (FIG), as well as northern and eastern Tasmania, New Caledonia and New Zealand (Cadwallader and Backhouse 1983, Beumer 1996). Spatial and temporal population genetic analysis of Longfin Eels in from east Australia indicate that populations are panmictic (Shen and Tzeng 2007). Longfin Eels reach a size of up to 1.65 m and 22 kg for females, and 0.65 m and 0.0.6 kg for males (Beumer 1996). Longfin Eels, as with other Anguilla species, are catadromous, spending much of their life cycle in estuaries or fresh water, before returning to the ocean to reproduce and die. Longfin Eels are relatively slow-growing and long-lived with estimates of maturity ages up to 52 years for females and 22 years for males being reported (Walsh 2004). Australian eel species are thought to spawn in the Coral Sea region of the West Pacific Ocean and small Longfin Eel (12.4, 12.5 mm) leptocephali have been collected south of the Solomon Islands (Kuroki et al. 2020). Following hatching, larvae (leptocephali) are transported toward the eastern Australian coastline by the South Equatorial Current, and then along the coast by the East Australian Current. Larvae metamorphose to glass eels, which actively swim toward and into the embayments and estuaries of the eastern Australian continent. Based on its life history and migration patterns, the Longfin Eel is thought to constitute single biological stock across its range.

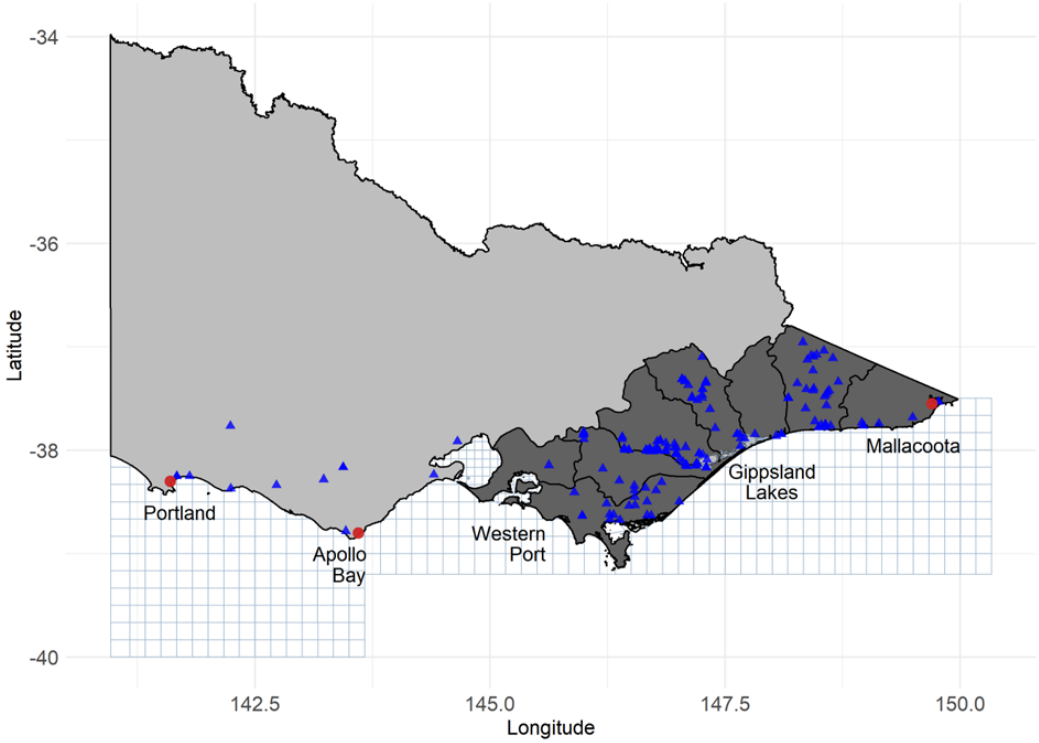


Figure 138 Longfin Eel distribution in Victoria (Dark shaded area = coastal river basins. Blue triangle = catch records from fisheries surveys).

Assessment Summary

The Victorian Eel Fishery is comprised of both Longfin Eel and Southern Shortfin Eel, which have different but overlapping distributions in estuarine and freshwaters east and south of the Great Dividing Range. Commercial fishing is generally confined to lower and estuarine reaches of waters that are open to fishing and predominantly targets migrating eels. The Victorian Longfin Eel Fishery, which is managed as one stock, supports both recreational and commercial fisheries.

The status of Longfin Eel was evaluated using:

- Available harvest information for the commercial eel fishery
- Nominal catch per unit effort (CPUE) for the commercial eel fishery fishing with fyke-nets.

This assessment found:

- *Fishing pressure* – The Victorian Longfin Eel Fishery is managed using a range of input controls and at least thirty per cent of all connected rivers, creeks and streams with a common opening to the sea are closed to commercial fishing (Victorian Fisheries Authority 2017). From 1979/80, annual catch increased to a peak of 59 t in 2004/05 (Figure 139). The Millennium Drought (2001–11) affected Longfin Eel catch less than that of Southern Shortfin Eel. Fishing pressure (effort) increased dramatically in the late 1990s but declined into the early 2000s, after which it was variable from year-to-year. Since the Millennium Drought annual catch has been variable, ranging 2.7–17.8 t (Figure 139).

  There is no long-term estimate of recreational harvest but it is believed to be very low. In recent surveys of recreational fishing licence holders, <0.4 per cent of anglers fishing in rivers and lakes preferred to catch eels and just 2.6 per cent indicated their favourite fish in inland waters to catch was eel (Australian Survey Research 2012, 2018).

  Eel is an important resource for some Aboriginal communities. The use of fish traps, channels and aquaculture systems (ponds and dam walls) in western Victoria dates back tens of thousands of years (Head 1989, Richards 2011). However, no quantitative estimates of the Aboriginal harvest of eels from Victorian waters are available.

- *Biomass* –Between 1979/80 and 2000/01 nominal average annual CPUE was 1.6-18.8 kg per net-day (mean 10.3 kg per net-day). Throughout the Millennium Drought CPUE declined, reaching its lowest value of 0.24 kg per net-day in 2011-12. Since then, however, CPUE has been slowly but steadily increasing to an annual average of 0.5–1.09 in the last three years (Figure 140).

  Juvenile and undersized eels (elvers and “snigs”), known as “restock”, are netted from coastal rivers and relocated into designated culture lakes (confined lakes and impoundments) in inland western Victoria for on-growing to market size under an Aquaculture Licence. This practice, which commenced in the 1960s, is dependent on access to restock eels. Productivity from culture lakes is highly susceptible to short and long term and seasonal environmental variations, particularly drought (Victorian Fisheries Authority 2017).

Stock status summary: Despite strong environmental drivers that can severely reduce productivity, the Victorian Longfin Eel fishery is well-managed using a range of input controls and at least thirty per cent of all connected rivers, creeks and streams with a common opening to the sea are closed to commercial fishing. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. The above evidence also indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired. On the basis of the evidence described above, Longfin Eel in Victoria is classified as a sustainable stock.

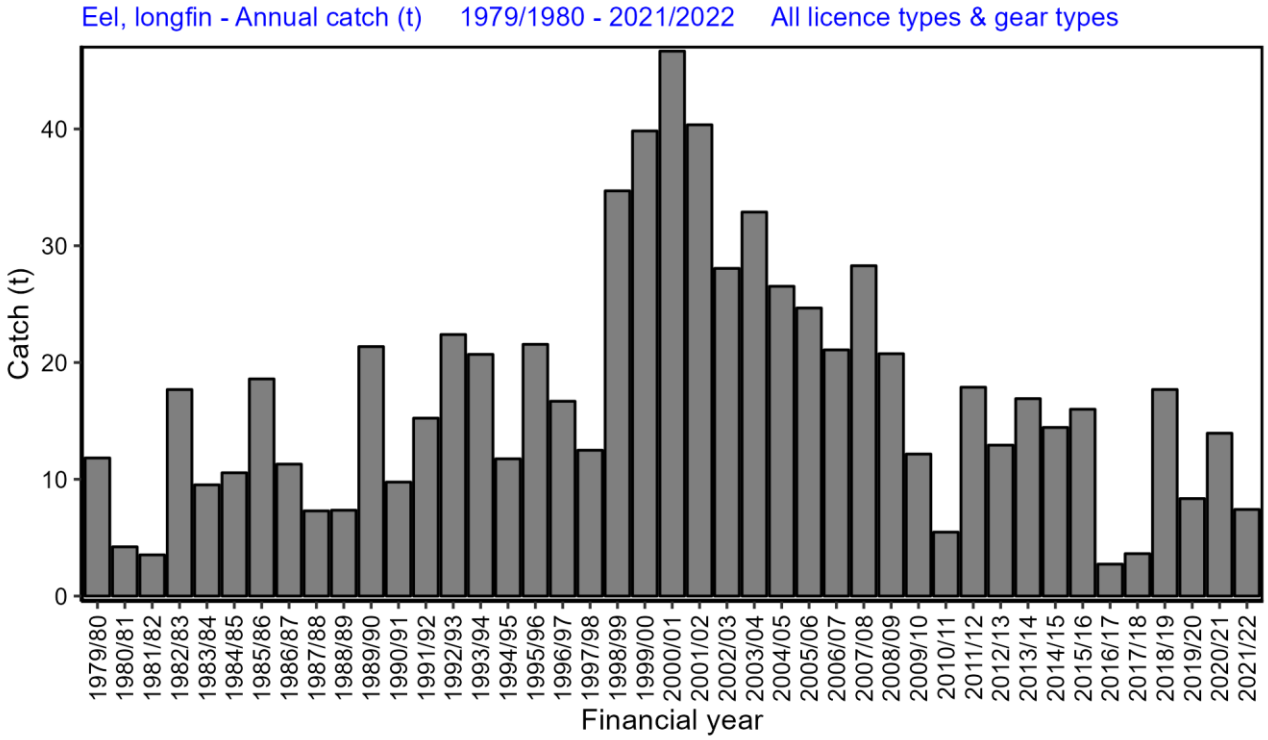


Figure 139 Longfin Eel harvest by Victorian licenced commercial operators during financial years 1979/79–2021/22.

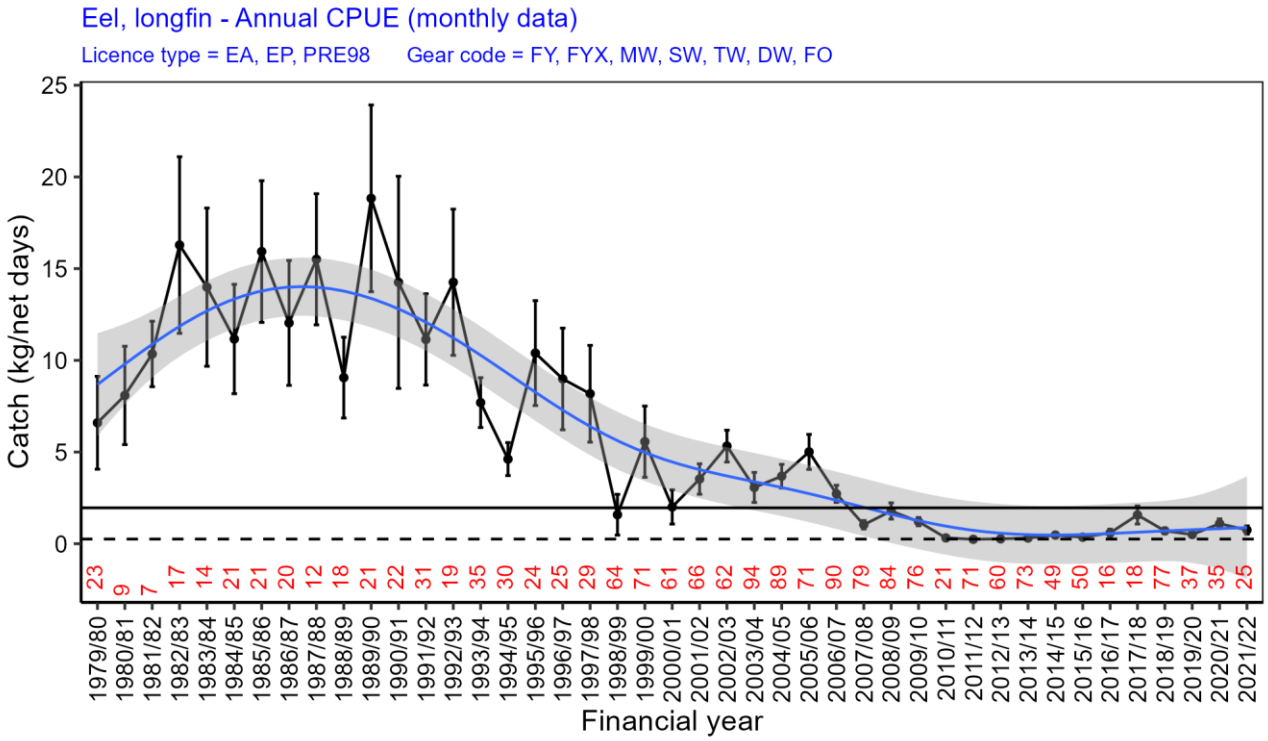


Figure 140 Nominal catch-per-unit-effort (CPUE) for commercial fyke net catches of Longfin Eels during 1979/80 – 2020/21.