Theme: Fauna

The Gippsland Lakes is recognised as a Wetland of International Importance under the Ramsar Convention, largely due to its role in supporting fauna. The site meets seven of the current listing criteria, six of which are related to fauna:

- Supports threatened species
    - Australasian bittern (*Botaurus poiciloptilus*)
    - Australian fairy tern (*Sternula nereis nereis*)
    - Curlew sandpiper (*Calidris ferruginea*)
    - Eastern curlew (*Numenius madagascariensis*)
    - Hooded plover (*Thinornis rubricollis rubricollis*)
    - Green and golden bell frog (*Litoria aurea*)
    - Growling grass frog (*Litoria raniformis*)
    - Australian grayling (*Prototroctes maraena*)
- Supports animal species in critical life stages of breeding, migration and drought refuge
- Supports > 20,000 waterbirds
- Supports > 1% of the population of three waterbird species:
    - Australian fairy tern
    - Chestnut teal
    - Little tern
- Provides important habitat for native fish, including nursery areas
- Supports > 1% of the population of the Burrunan dolphin (*Tursiops australis*)

The fauna of the Gippsland Lakes provide social, cultural and economic benefits to a wide variety of people. The lakes are an important commercial fishery with 10 Gippsland Lakes Fishery Access Licences and a further nine Gippsland Lakes (Bait) Fishery Access Licence holders. The site is also an important recreational fishery. Tourism for the Gippsland Lakes and broader East Gippsland region is estimated at $267 million annually (Worley Parsons 2013).

Fish

Indicators and thresholds

Native fish abundance and diversity is critical to the ecological character of the Ramsar site and have been used as the indicators of condition. A recent assessment of fish stocks in the Gippsland Lakes derived thresholds for abundance as follows, and these have been adopted (Conron et al. 2020):

- Good = above average
- Fair = average
- Poor = below average

A quantitative RCT for native fish diversity has been established (EGCMA 2015):

- Maintain native fish species richness, with a minimum of 70 species recorded in the Deep and Shallow lakes over any five-year period (based on Warry and Hindell 2012).

Thresholds for condition have been derived based on the RCT:

- Good = 70 native fish species
- Fair = 50 to 70 native fish species
- Poor = < 50 native fish species.

Locations

Native fish are important throughout the Ramsar site, in both the main lakes and the fringing wetlands. Data, however, are limited to the main lakes.

Results

Summary

Indicator	Status and trends	Summary
	Unknown Poor Fair Good	
Fish abundance	Black bream and yellow-eye mullet  Tailor  Silver trevally  **Data quality:** Fair **Data custodian:** Fisheries Victoria	The Gippsland Lakes is a recognised important recreational fishery. The Lakes also support diversity of native fish, that are not associated with recreational fisheries, with a total of 180 species recorded. Data on abundance and populations, is however, limited to fisheries species based on catch rates. Recent assessments by Fisheries Victoria have indicated that populations of black bream are likely to be on a trajectory of decline, with the last large recruitment event nearly three decades ago in the late 1980s. Similarly, yellow-eye mullet was assessed as being depleted. Populations of silver trevally and tailor were assessed as being stable, above average numbers of silver trevally, average numbers of tailor in recent years.
Fish diversity	 **Data quality:** Fair **Data custodian:** East Gippsland CMA	The Gippsland Lakes support an abundance and diversity of native fish in addition to commercially and recreationally important species (Warry and Hindell 2012). Over 180 species of fish have been recorded within the Gippsland Lakes (Hindell, DELWP, unpublished data) spanning a wide range of life cycles. A more recent assessment of the fish community in Lake King by the Friends of Beware Reef (2017 to 2019) recorded over 100 species of fish indicative of a diverse marine and estuarine fish community. This is above the RCT and indicative of “good” condition. There is, however, no data to assess trend in fish diversity.

Status

Black bream is the most targeted species in the Gippsland Lakes by recreational fishers. Commercial fishing was removed from Gippsland Lakes in 2020. Whilst not current to today’s situation, the data from commercial fishing is still useful as an indicator of existing status. An assessment of stocks and catch rates indicates that catch per unit effort (CPUE) is highly variable over time but has remained below average for the past six years (Figure 1). This equates to a status of “poor”.

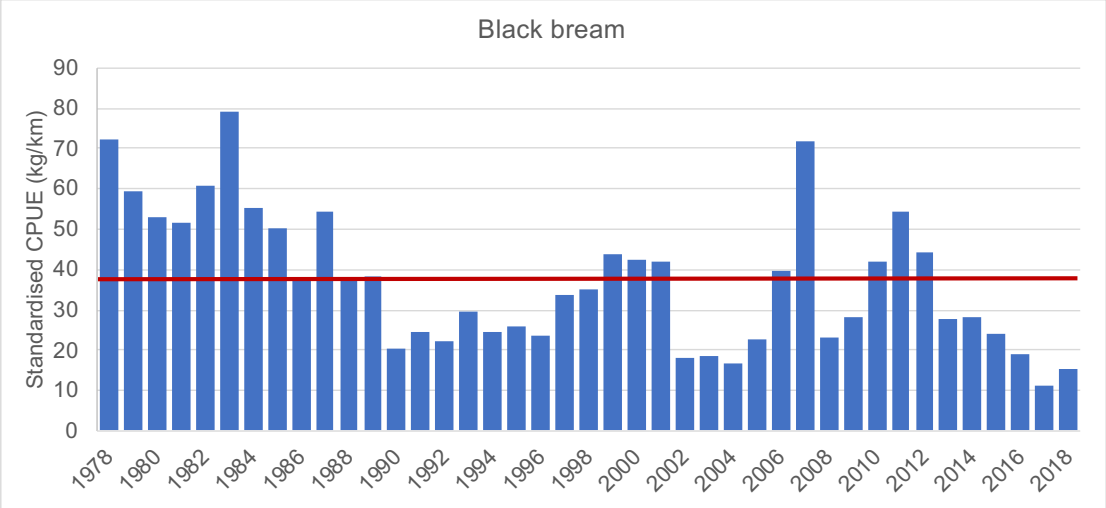

Figure 1: Standardised catch per unit effort (kg/km) for black bream from the Gippsland Lakes by mesh net from 1978/79 to 2018/19 (Conron et al. 2020). Red line is the reference period (1985 to 2015) average.

Data on abundance of the next three most common fishery species is provided in Table 1. This indicates that yellow-eye mullet was below average, indicating "poor" status; tailor was average, indicating fair status and silver trevally was above average indicating "good" status.

Table 1: Stock status determinations using catch per unit effort (kg/km/hr) for key species of the Gippsland Lakes commercial fishery (Conron et al. 2020).

Measure	Yellow-eye mullet	Tailor	Silver trevally
Long term average	39	2.6	21
Recent five year average	27	38	54
Trend in recent five years	Decreasing	Stable	Stable
Status	Below average	Average	Above average

The Gippsland Lakes support an abundance and diversity of native fish in addition to commercially and recreationally important species (Warry and Hindell 2012). Over 180 species of fish have been recorded within the Gippsland Lakes (Hindell, DELWP, unpublished data) spanning a wide range of life cycles. A more recent assessment of the fish community in Lake King by the Friends of Beware Reef (2017 to 2019) recorded over 100 species of fish indicative of a diverse marine and estuarine fish community. This is above the RCT and indicative of "good" condition.

Trend

The trend in abundance of indicator commercial fish species as provided by the fisheries stock assessment (Conron et al. 2020) was for decreasing populations of black bream and yellow-eye mullet, but stable trends for tailor and silver trevally. The catch rates of all these species are highly variable and with the cessation of commercial fishing in the Gippsland Lakes from April 2020, ongoing trends will need to be evaluated from recreational fishing data.

Influencing factors and threats

Fish species within the Gippsland Lakes Ramsar site are distributed according to their salinity tolerances, availability of structural habitat and productivity. A number of freshwater native fish species occur in the freshwater and fresher areas of the variably saline fringing wetlands as well as the lower reaches of the rivers within the Ramsar site. This includes resident species that spend their entire lives within freshwater environments such as river blackfish (*Gadopsis marmoratus*); but more common are species that rely on the connection between

freshwater and estuarine or marine environments to complete parts of their life cycles. This includes species such as shortfin (*Anguilla australis*) and longfin (*Anguilla reinhardtii*) eels which live the majority of their lives in freshwater environments before migrating to the sea to breed and die, with young returning to freshwater; and species such as pouched lamprey (*Geotria australis*) that live the majority of their lives in marine environments, migrating to freshwater environments to breed.

There are a small number of estuarine resident fish species within the Gippsland Lakes such as river garfish (*Hyporhamphus regularis*), estuary perch (*Macquaria colonorum*) and black bream (*Acanthopagrus butcheri*) that reside in the estuarine areas of the site (including the large coastal lagoons). Salinity regimes are important for successful spawning and recruitment of these species, especially the recreationally important black bream (Hindell et al. 2008).

The majority of species are either estuarine opportunists or marine stragglers. These species stay in the lower to mid zones of the lakes (utilising marine habitats such as seagrass) until conditions become too fresh. Their use of the lakes is largely dependent on the extent of higher salinity conditions and the extent of seagrass habitats and these species will be displaced from the lakes during high freshwater inflows. This group includes conservation significant species groups such as pipefish, seahorses and dragons as well as larger species such as wrasse, cod and dory.

References

Conron, S., Bell, J.D., Ingram, B., and Gorfine, H. (2020). Review of key Victorian fish stocks — 2019. State of Victoria, Queenscliff, Victoria.

Hindell, J.S., Jenkins, G.P., and Womersley, B. (2008). Habitat utilisation and movement of black bream Acanthopagrus butcheri (Sparidae) in an Australian estuary. Marine Ecology Progress Series **366**: 219–229.

Warry, F.Y. and Hindell, J.S. (2012). Fish Assemblages and Seagrass Condition of the Gippsland Lakes. Arthur Rylah Institute for Environmental Research, Heidelberg, Victoria.

Worley Parsons. (2013). Assessing the value of Coastal Resources in Victoria. Victorian Coastal Council, Melbourne.