

Maugean Skate, *Zearaja maugeana*

Report Card assessment	Depleted		
IUCN Red List Australian Assessment	Endangered (Endemic to Australia)	IUCN Red List Global Assessment	Endangered
Global Assessors	Last, P.R., Gledhill, D.C. & Sherman, C.S.		
Australian Assessors	Kyne, P.M., Heupel, M.R., White, W.T., Simpfendorfer, C.A. (Shark Action Plan) & Rigby, C.L.		
Report Card Remarks	Uniquely brackish estuarine species, highly restricted range, historically only recorded from two locations, inferred continuing decline in range (now know from only one location) and habitat quality. Listed on EPBC Act (Endangered).		

Summary

The Maugean Skate is a medium-sized rare ray endemic to a highly restricted area of temperate western Tasmania, only ever being recorded in two estuarine harbours. It is the only skate to occur entirely within brackish estuarine waters and evidence suggests high site fidelity. The two harbours represent two separate subpopulations with the population size of Macquarie Harbour estimated as 3,200 individuals in 2014 and continuing to decline. The population of Bathurst Harbour may be locally extinct or extremely small as no individuals have been observed for 20 years despite dedicated surveys and eDNA surveys that have produced negative results (Moreno et al. 2022). The species is incidentally caught in Macquarie Harbour by recreational fishers and occasionally by commercial gillnet fisheries some post-release mortality occurs and it was assessed as at high risk from gillnetting. Water quality in Macquarie Harbour is negatively impacted by mining pollution, unnatural flow regimens created by hydroelectricity power generating schemes, and salmon aquaculture with the historical expansion in the latter coinciding with extreme hypoxic conditions particularly at egg deposition depths. This may severely reduce breeding success and have a catastrophic impact on the subpopulation. The species is highly vulnerable to climate change. The IUCN status is not due to overfishing but rather a continuing decline in both the highly restricted range and habitat quality. The Maugean Skate is assessed globally and in Australia as Endangered (IUCN) (Kyne et al. 2021), and Depleted (SAFS).



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Distribution

The Maugean Skate is endemic to western Tasmania where it occurs in temperate waters in a highly restricted range of only two estuarine locations, Macquarie and Bathurst Harbours (Last et al. 2016). The area of occupancy (AOO) is <math><300\text{ km}^2</math> and the extent of occurrence (EOO) is <math><1,900\text{ km}^2</math> (Last et al. 2016).

Stock structure and status

The two locations represent two subpopulations with the Macquarie Harbour subpopulation relatively abundant and estimated as approximately 3,200 individuals though this is highly uncertain (Bell et al. 2016, Awruch et al. 2021). The Bathurst Harbour subpopulation may be extremely small or locally extinct as no individuals have been seen since 1992 despite targeted surveys (Treloar et al. 2017, Awruch et al. 2021). The highly restricted range is inferred to continue to decline along with habitat quality which leads to an Endangered status.

Fisheries

The Maugean Skate is incidentally caught regularly in Macquarie Harbour by recreational fishers and occasionally by commercial gillnet fishers (Lyle et al. 2014). It is normally be released as it is a protected species under the *Environment Protection and Biodiversity Conservation Act 1999* (listed as Endangered in 2004) and under the *Tasmanian Threatened Species Protection Act 1995*. Macquarie Harbour is facing increasing human activity and is subject to water quality pressure from pollution from mining operations, hydroelectricity generation, and historically expanded salmonid aquaculture which coincided with extreme hypoxic conditions beyond 15 m depth (Bell et al. 2016a, Last et al. 2016). These depths are used for egg case deposition and the continuing hypoxic habitat could severely reduce embryo survival and thus breeding success and be catastrophic for the subpopulation (Last et al. 2016, Moreno et al. 2020, Kyne et al. 2021). Since 2012, a reduction in the relative abundance of juvenile and sub-adults and an increase in size of adults has been observed; this may be linked to a recent recruitment decline coupled with adult growth (Moreno et al. 2020). It has been assessed as at high risk from the gillnetting, although catches are only occasional and most survive release, any mortality of this species is said to justify a high risk ranking (Bell et al. 2016b). Bathurst Harbour is within the Tasmanian Wilderness World Heritage area which is a no-take marine protected area and offers some protection (Awruch et al. 2021). However, it is also subject to increased human activity that could degrade water quality. The Maugean Skate was assessed as highly vulnerable to climate change and moderately vulnerable to fishing (Walker et al. 2021).

Habitat and biology

The Maugean Skate is demersal at depths of 0–55 m and the only skate restricted to brackish estuarine and almost freshwaters (Bell et al. 2016, Last et al. 2016, Moreno et al. 2020). It has a high site fidelity mainly occurs in 5–15 m depths but lays egg cases at depths of 2–52 m (Treloar et al. 2017, Moreno et al. 2020). Maximum size is 87 cm total length (TL) and maximum age estimated at 10–15 years (Bell et al. 2016, Treloar et al. 2017, Awruch et al. 2021). Males and females likely mature at 4–6 years and males at 60–64 cm TL and females at 66–68 cm TL (Bell et al. 2016, Awruch et al. 2021).

Longevity and maximum size	Longevity: estimated at 10–15 years Max size: 87 cm TL
Age and/or size at maturity (50%)	Males: 4–6 years, approximately 60–64 cm TL Females: 4–6 years, 66–68 cm TL

CAAB Code: 37 031037

Link to IUCN Page: <https://www.iucnredlist.org/species/64442/68650404>

Link to page at Shark References: <https://shark-references.com/species/view/Zearaja-maugeana>

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