

## Plain Maskray, *Neotrygon annotata*

Report Card assessment	Sustainable		
IUCN Red List Australian Assessment	Near Threatened	IUCN Red List Global Assessment	Near Threatened
Global Assessors	Jacobsen, I.P., Kyne, P.M. & Last, P.R.		
Australian Assessors	Kyne, P.M., Heupel, M.R., White, W.T., Simpfendorfer, C.A. (Shark Action Plan) & Rigby, C.L.		
Report Card Remarks	Heavily fished historically, relatively restricted range with limited refuge and low biological productivity yet now sustainably fished in northern Australia.		

### Summary

The Plain Maskray is a small continental shelf ray that occurs across tropical northern Australia and in eastern Indonesia and southern Papua New Guinea (PNG). It is captured incidentally across its range by trawl fisheries and may be retained for its meat in PNG and is released in Australia where it is now prohibited from retention, and although post-release mortality unknown it is suspected to be high. It was historically subject to intense fishing pressure

across northern Australia until the 1990s. It is taken in the Northern Prawn Fishery (NPF), the Northern Territory Demersal Fishery, and the Western Australian Kimberley Prawn Fishery (KPF). Risk assessments estimate it is not being overfished in the NPF and catch is currently estimated as minimal in the KPF. However, the species has been heavily fished historically and has limited biological productivity alongside a relatively restricted distribution with most of its spatial and depth range fished; in some parts of its range it accounts for a significant proportion of the elasmobranch bycatch. It is suspected that the population has undergone a population decline though not to levels where it would be threatened. Therefore, the Plain Maskray is assessed as globally and in Australia as Near Threatened (IUCN) (Kyne et al. 2021) and in Australia, Sustainable (SAFS).



### Distribution

The Plain Maskray occurs in tropical waters of northern Australia, eastern Indonesia and southern Papua New Guinea (Last et al. 2016, Kyne et al. 2021). In Australia, it ranges from the Wellesley Islands in the Gulf of Carpentaria (Queensland) to the Bonaparte Archipelago (Western Australia) (Last and Stevens 2009).

### Stock structure and status

There is currently no information on population size, structure, or trend for the species.

## Fisheries

The Plain Maskray was historically subject to high fishing pressure over three decades till the early 1990s (Jacobsen et al. 2015). It is incidentally caught by trawl fisheries and is considered at medium risk from the Gulf of Papua Prawn Fishery (Papua New Guinea) (Baje et al. 2021). In Australia, it is mainly caught in the Commonwealth Northern Prawn Fishery (NPF) and likely in the Northern Territory Demersal Fishery (DF) and the Western Australian Kimberley Prawn Fishery (KPF). It was one of the most abundant elasmobranch bycatch species in the Joseph Bonaparte Gulf (JBG) sector of the NPF (Tonks et al. 2008). It is released as ray retention is now prohibited, though post-release survival may be low as found for *Neotrygon* species in trawl nets in Papua New Guinea and capture-induced parturition has been reported for other *Neotrygon* species and dasyatids (Jacobsen et al. 2015, Adams et al. 2018, White et al. 2019). Although bycatch reduction devices (BRDs) have been mandatory since 2000, their effectiveness is limited at excluding small rays such as this species (Griffiths et al. 2006). The Plain Maskray was considered at low risk of overfishing in the JBG and across the whole NPF; in the JBG due to low effort and spatial overlap of the species and fishery during the 2010–2013 assessment, and in the NPF due to estimated fishing mortality being below levels leading to population reduction (Zhou and Griffiths 2008, Zhou et al. 2015). The DF uses demersal trawls with limited effort and mandated BRDs, though catch levels of the Plain Maskray are unknown (NTG 2019). Catches in the KPF are likely minimal as negligible bycatch has been reported in recent years (Gaughan and Santoro 2021).

## Habitat and biology

The Plain Maskray is demersal on the continental shelf at depths of 10–60 m (Last et al. 2016). Maximum size is 30 cm disc width (DW) and at least 45 cm total length (TL) (Last et al. 2016, Baje et al. 2021). Maximum age estimated as 9 years for males and 13 years for females (Jacobsen et al. 2015). Males are estimated to mature at 4 years and 20 cm DW and females at 3–4 years and 19 cm DW (Jacobsen and Bennet 2010). Litter size is 1–3 pups (Jacobsen and Bennet 2010).

Longevity and maximum size	Longevity: estimated males 9 years and females 13 years Max size: 30 cm DW and 45 cm TL
Age and/or size at maturity (50%)	Males: 4 years, 20 cm DW Females: 3–4 years, 19 cm DW

**CAAB Code:** 37 035012

**Link to IUCN Page:** <https://www.iucnredlist.org/species/60150/68636040>

**Link to page at Shark References:** <https://shark-references.com/species/view/Neotrygon-annotata>

## References

- Adams, K.R., Fetterplace, L.C., Davis, A.R., Taylor, M.D. and Knott, N.A. 2018. Sharks, rays and abortion: The prevalence of capture-induced parturition in elasmobranchs. *Biological Conservation* 217, 11–27.
- Baje, L., Chin, A., White, W.T., and Simpfendorfer, C.A. Ecological risk assessment of elasmobranchs caught in the Gulf of Papua prawn fishery. *Aquatic Conservation: Marine and Freshwater Ecosystems* n/a(n/a). doi: <https://doi.org/10.1002/aqc.3692>
- Gaughan, D.J. and Santoro, K. (eds). 2021. *Status Reports of the Fisheries and Aquatic Resources of Western Australia 2019/20: The State of the Fisheries*. Department of Primary Industries and Regional Development, Western Australia.
- Griffiths, S. P., Brewer, D. T., Heales, D. S., Milton, D. A. and Stobutzki, I. C. 2006. Validating ecological risk assessments for fisheries: assessing the impacts of turtle excluder devices on elasmobranch bycatch populations in an Australian trawl fishery. *Marine and Freshwater Research* 57: 395–401.
- Jacobsen, I.P. and Bennett, M.B. 2010. Age and growth of *Neotrygon picta*, *Neotrygon annotata* and *Neotrygon kuhlii* from north-east Australia, with notes on their reproductive biology. *Journal of Fish Biology* 77: 2405–2422.
- Jacobsen, I.P., Kyne, P.M. and Last, P.R. 2015. *Neotrygon annotata*. The IUCN Red List of Threatened Species 2015: e.T60150A68636040.
- Kyne, P.M., Heupel, M.R., White, W.T. and Simpfendorfer, C.A. 2021. *The Action Plan for Australian Sharks and Rays 2021*. National Environmental Science Program, Marine Biodiversity Hub, Hobart.
- Last, P.R. and Stevens, J.D. 2009. *Sharks and Rays of Australia*. Second Edition. CSIRO Publishing, Collingwood, Australia.

- Last, P., White, W., Carvalho, M.R. de, Séret, B., Stehmann, M. and Naylor, G.J.P. 2016. *Rays of the World*. CSIRO Publishing, Clayton, Victoria, Australia.
- Kyne, P.M., Heupel, M.R., White, W.T. and Simpfendorfer, C.A. 2021. *The Action Plan for Australian Sharks and Rays 2021*. National Environmental Science Program, Marine Biodiversity Hub, Hobart.
- Northern Territory Government (NTG) 2019. Application for reassessment under the EPBC Act of the Northern Territory Demersal Fishery. Northern Territory Government.
- Tonks, M.L., Griffiths, S.P., Heales, D.S., Brewer, D.T. and Dell, Q. 2008. Species composition and temporal variation of prawn trawl bycatch in the Joseph Bonaparte Gulf, northwestern Australia. *Fisheries Research* 89(3), 276–293.
- White, W.T., Baje, L., Simpfendorfer, C.A., Appleyard, S., Chin, A., Sabub, B., Rochel, E. and Naylor, G.J.P. 2019. Elasmobranch bycatch in the demersal prawn trawl fishery in the Gulf of Papua, Papua New Guinea. *Scientific Reports* 9: 1–16.
- Zhou, S.J. and Griffiths, S.P. 2008. Sustainability Assessment for Fishing Effects (SAFE): A new quantitative ecological risk assessment method and its application to elasmobranch bycatch in an Australian trawl fishery. *Fisheries Research* 91: 56–68
- Zhou, S., Buckworth, R.C., Miller, M. and Jarrett, A. 2015. *A SAFE analysis of bycatch in the Joseph Bonaparte Gulf fishery for Red-legged Banana Prawns*. CSIRO Oceans and Atmosphere Flagship, Brisbane, Australia.