

Brier Shark, *Deania calcea*

Report Card assessment	Recovering		
IUCN Red List Australian Assessment	Near Threatened	IUCN Red List Global Assessment	Near Threatened
Assessors	Finucci, B., Cheok, J., Cotton, C.F., Kulka, D.W., Neat, F.C., Pacoureaux, N., Rigby, C.L., Tanaka, S. & Walker, T.I.		
Australian Assessors	Kyne, P.M., Heupel, M.R., White, W.T. & Simpfendorfer, C.A. (Shark Action Plan)		
Report Card Remarks	Abundant in Australia, and regularly caught in fisheries; management measures are in place to protect deepwater sharks.		

Summary

The Brier Shark is one of the more abundant mid-slope species of deepwater dogfish. It is widespread but patchily distributed across the eastern and western Pacific, and eastern Atlantic. The species is mainly a bycatch species taken by trawl and hook, although with some limited targeting, for its flesh and liver oil. In Australia, it is taken the Southern and Eastern Scalefish and Shark Fishery (SESSF) and is the most commonly reported deepwater shark species landed in this fishery.



Source: CSIRO National Fish Collection. License: CC BY Attribution

Declines of 87% over 20 years to the mid-1990s have been recorded off New South Wales. This part of its range is still continually fished and there is no evidence that numbers have recovered on these fishing grounds. Following similar documented declines in other deepwater dogfish species in this area, management measures were implemented to promote recovery that included catch limits and spatial and depth closures. Therefore, the species is assessed as Near Threatened (IUCN) in Australia (Kyne et al. 2021) and Recovering (SAFS) as there is limited catch in much of its Australian range and management measures were implemented.

Distribution

The Brier Shark is found in the eastern Atlantic (Iceland to Southern Africa), eastern Pacific (Chile and Peru) and western Pacific (Japan, Australia and New Zealand). In Australia, it occurs between Coffs Harbour (New South Wales) and Green Head (Western Australia) (Long 1997, Last and Stevens 2009).

Stock structure and status

Some biomass estimates are available from New Zealand (Clark et al. 2000) and these show no evidence of a declining trend. Research surveys on the New South Wales slope over a 20 year period

showed a 87% decline in abundance for the related Longsnout Dogfish *Deania quadrispinosa* (Graham et al. 1997). Outside of this range there is no information on stock status, although given limited fishing it is likely that across its Australian range the decline is substantially less.

Fisheries

The Brier Shark is taken by trawl, hook and gillnet mostly as bycatch but also as a target for its liver oil and flesh. The livers are high in squalene comprising about 70% by weight (Bakes et al. 1995). Catch rates of up to 500 kg/h have been reported from Australia where catches increased during the early 2000s with relaxation of mercury laws and fishers looking for non-quota species in SESSF. However, more recently a basket quota was introduced for deepwater sharks and catches have declined with reduced effort targeting these species (AFMA 2023). The Brier Shark is the most commonly landed species in this basket of deepwater shark species. Due to sustainability concerns for deepwater species most commercial fishing banned below 700 m depth (Last and Stevens 2009) providing some refuge from fishing at depth for this species.

Habitat and biology

The Brier Shark occurs on the outer continental slopes at depths of 60–1,490m, most commonly from 750–800 m (Ebert and Stehmann 2013). Maximum size is 122 cm total length (TL) and estimated maximum age is 35 years (Clarke et al. 2002). Males mature at 81–94 cm TL and 17 years and females at 99–106 cm TL and 25 years (Ebert and Stehmann 2013). It may occur in large groups and appears to segregate by size, sex, and maturity status (Moura et al. 2014). Their diet suggests that they feed at some height above the bottom (Daley et al. 2002), which may reduce their susceptibility to demersal trawl gear. Gestation may take up to two years and litters range from one to 17 pups.

Longevity and maximum size	Longevity: estimated 35 years Max size: 122 cm TL
Age and/or size at maturity (50%)	Males: 17 years, 81–94 cm TL Females: 25 years, 99–106 cm TL

CAAB Code: 37 020003

Link to IUCN Page: <https://www.iucnredlist.org/species/41798/68619155>

Link to page at Shark References: <http://www.shark-references.com/species/view/Deania-calcea>

References

- AFMA 2023. *Southern and Eastern Scalefish and Shark Fishery (SESSF) Species Summaries 2021*. AFMA, Canberra
- Bakes, M.J. and Nichols, P.D. 1995. Lipid, fatty acid and squalene composition of liver oil from six species of deep-water sharks collected in southern Australian waters. *Comparative Biochemistry and Physiology* 110B (1): 267–275.
- Clark, M.R., Anderson, O.F., Francis, R.I.C.C. and Tracey, D.M. 2000. The effects of commercial exploitation on orange roughy (*Haplostethus atlanticus*) from the continental slope of the Chatham Rise, New Zealand, from 1979 to 1997. *Fisheries Research* 45: 217–238.
- Clarke, M.W., Connolly, P.L. and Bracken, J.J. 2002. Catch, discarding, age estimation, growth and maturity of the squalid shark *Deania calcea* west and north of Ireland. *Fisheries Research* 56: 139–153
- Daley, R., Stevens, J. and Graham, K. 2002. *Catch analysis and productivity of the deepwater dogfish resource in southern Australia*. Report by CSIRO Marine Research and NSW Fisheries to the Fisheries Research and Development Corporation. FRDC Project 1998/108.
- Ebert, D.A. and Stehmann, M.F.W. 2013. *Sharks, batoids, and chimaeras of the North Atlantic*. *FAO Species Catalogue for Fishery Purposes No. 7*. Food and Agricultural Organization of the United Nations (FAO). FAO, Rome.
- Graham, K.J., Wood, B.R. and Andrew, N.L. 1997. *The 1996-97 survey of upper slope trawling grounds between Sydney and Gabo Island (and comparisons with the 1976-77 survey)*. Kapala Cruise Report No. 117, December 1997. NSW Fisheries, Cronulla, 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
- Last, P.R. and Stevens, J.D. 2009. *Sharks and Rays of Australia*. Second Edition. CSIRO Publishing, Collingwood.
- Long, D.J. 1997. First account of the birdbeak dogfish shark, *Deania calcea*, (Chondrichthyes: Squalidae) from the northern coast of Peru. *Review Biological Tropical* 45 (2): 937.

- Moura, T., Jones, E., Clarke, M.W., Cotton, C.F., Crozier, P., Daley, R.K., Diez, G., Dobby, H., Dyb, J.E., Fossen, I., Irvine, S.B., Jakobsdottir, K., Lopez-Abellan, L.J., Lorange, P., Pascual-Alayon, P., Severino, R.B. and Figueiredo, I. 2014. Large-scale distribution of three deep-water squaloid sharks: Integrating data on sex, maturity and environment. *Fisheries Research* 157: 47–61.
- Ruiz-Pico, S., Velasco, F., Baldó, F., Rodríguez-Cabello, C. and Fernández-Zapico, O. 2014. *Results on main elasmobranch species captured during the 2001-2013 Porcupine Bank (NE Atlantic) bottom trawl surveys*. Working Document of the Working Group on Elasmobranch Fishes (WGEF), June 2014. International Council for the Exploration of the Sea (ICES), Denmark.