Spot-Tail Shark (2020)

Carcharhinus sorrah

Michael Usher: Department of Industry, Tourism and Trade, Northern Territory Government, **Matias Braccini**: Department of Primary Industries and Regional Development, Western Australia, **Anthony Roelofs**: Department of Agriculture and Fisheries, Queensland

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia, Northern Territory, Queensland	Northern Australia	Sustainable	Biomass, fishing mortality, catch, catch rate

STOCK STRUCTURE

Spot-tail Shark (*Carcharhinus sorrah*) are medium-sized Whalers that are common over open areas on the shallow continental and insular shelves in northern Australian and Indo-West Pacific waters [Last and Stevens 2009]. Spot-tail Shark form discrete populations across deep water boundaries, with the Australian population thought to be distinct [Giles et al. 2014, Naylor et al. 2012]. While stock differentiation between Australia and other regions is well established, population structure within Australia is less clear. Genetic studies have found low to no genetic structuring within Australia waters [Giles et al. 2014, Lavery and Shaklee 1989, Ovenden et al. 2007] and tag release research has shown that Spot-tail Shark display movements that would provide sufficient gene flow to prevent genetic stock differentiation [Stevens et al. 2000].

Here, assessment of the stock status for Spot-tail Sharks is presented at the biological stock level—Northern Australia.

STOCK STATUS

Northern Australia

The Northern Australian biological stock straddles three jurisdictions: Western Australia, The Northern Territory (NT) and Queensland.

Spot-tail Sharks are relatively easily distinguished from other blacktip shark species and have been recorded to species level in NT commercial logbooks since 2000. In the Northern Territory Spot-tail Shark is primarily taken in the Offshore Net and Line Fishery (ONLF) under a species specific total allowable catch limit, which is managed through an individual transferable quota system. NT commercial catches from this stock have declined to relatively low levels since 2012, averaging 15 t a year from 2013 to 2019, compared to an average of 109 t a year over the preceding six years. This decrease in catch was largely

driven by changing operational practises in the NT ONLF [Northern Territory Government 2017].

In Queensland, Spot-tail Sharks are harvested in the East Coast Inshore Fin Fish Fishery and the Gulf of Carpentaria Inshore Fin Fish Fishery. Since 2000, the estimated total annual commercial and recreational catch has ranged from 19–99 t on the east coast and 71–147 t in the Gulf of Carpentaria. In 2019, the estimated combined catch on the east coast was 19 t (ten year average of 56 t) and in the Gulf of Carpentaria 76 t (ten year average of 113 t). In 2009 Queensland introduced a 600 t annual total allowable commercial catch (TACC) limit (species combined), applying to all sharks and rays retained for sale on the Queensland east coast. This TACC was introduced in conjunction with an 'S' fishing symbol that significantly reduced the number of licences permitted to target sharks in high quantities. Recreational harvest in Queensland is limited to one shark in possession and maximum legal size of 1.5 m total length.

An assessment was undertaken for the Northern Australian biological stock utilising a stock reduction analysis model. CPUE from the pelagic gillnet component of the ONLF was used as the abundance indicator for this assessment. The results estimate that biomass in 2019 was 91 per cent of the unfished levels and that fishing mortality in 2019 was 14 per cent of that required to reach maximum sustainable yield [Usher et al. 2020]. The results of this assessment are consistent with mark-recapture studies undertaken on all species of Blacktip Shark in Northern Territory waters [Bradshaw et al. 2013], a previous assessment undertaken for the Northern Territory and West Australian portion of this stock [Grubert et al. 2013] and an assessment that demonstrates that Spot-tail Shark are being fished within sustainable limits on the east coast of Australia [Leigh 2015].

Although there is uncertainty regarding species composition and the magnitude of historical catches of Blacktip Sharks from Western Australia, commercial harvests of Spot-tail Shark in this jurisdiction have been negligible since April 2009 [Molony et al. 2013], allowing the biomass to increase. In addition, recreational catches are negligible [Ryan et al 2019].

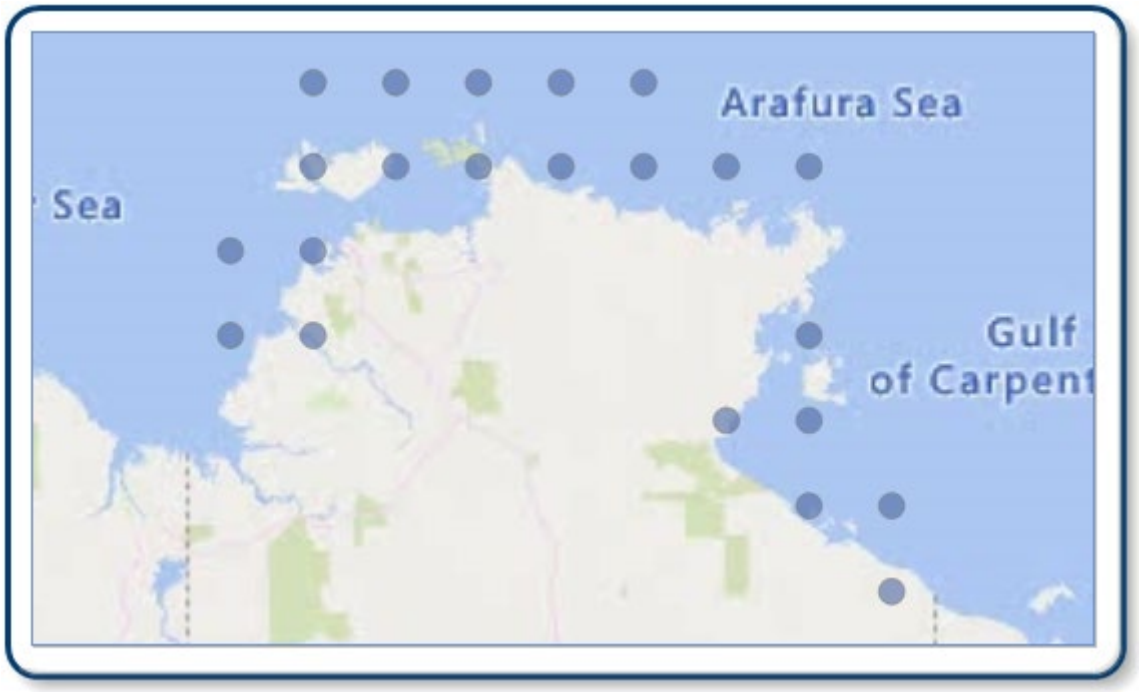
On the basis of the evidence provided above, the Northern Australian biological stock is classified as a **sustainable stock**.

BIOLOGY

[Harry 2011, Last and Stevens 2009].

Species	Longevity / Maximum Size	Maturity (50 per cent)
Spot-Tail Shark	Females 14 years, males 9 years, 1 600 mm TL	2-3 years, both sexes 900-950 mm TL

DISTRIBUTION



.

TABLES

Fishing methods			
	Northern Territory	Queensland	Western Australia
Charter			
Hook and Line	✓		
Commercial			
Gillnet	✓		
Line		✓	
Longline (Unspecified)	✓		
Net		✓	
Recreational			
Handline			✓
Hook and Line	✓	✓	

Management Methods			
	Northern Territory	Queensland	Western Australia
Charter			
Bag limits			✓
Gear restrictions	✓		
Licence (boat-based sector)			✓

Possession limit	✓		
Spatial closures	✓		✓
Commercial			
Catch limits			✓
Effort limits (individual transferable effort)			✓
Gear restrictions	✓	✓	✓
Limited entry			✓
Limited entry (licensing)		✓	
Maximum size limit		✓	
Possession limit		✓	
Processing restrictions	✓		
Quota	✓		
Spatial closures	✓	✓	✓
Total allowable catch	✓	✓	
Recreational			
Bag limits			✓
Gear restrictions	✓		✓
Licence (boat-based sector)			✓
Maximum size limit		✓	
Possession limit	✓	✓	
Spatial closures	✓		✓

Catch			
	Northern Territory	**Queensland**	**Western Australia**
Charter	Unknown		
Commercial	23.1269 t	19.7821 t	0 t
Indigenous	Unknown	Unknown	Unknwon
Recreational	Unknown	Unknown	No Spot-Tail Shark caught from boats

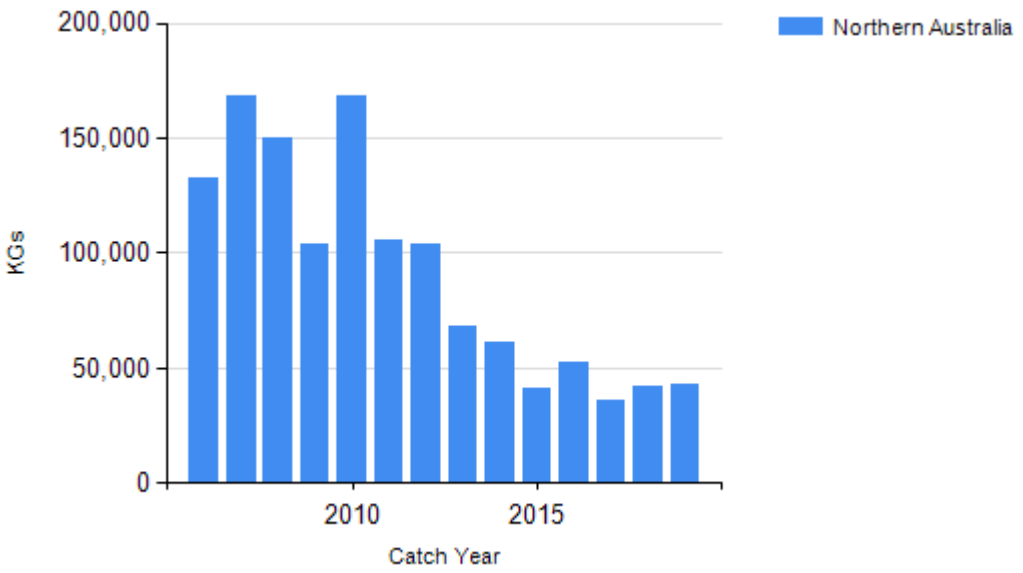
			[Ryan et al. 2019], shore-based catches are undetermined

Northern Territory – Charter (management methods) In the Northern Territory, charter operators are regulated through the same management methods as the recreational sector but are subject to additional limits on license and passenger numbers.

Northern Territory – Indigenous (management methods) The *Fisheries Act* 1988 (NT), specifies that "…without derogating from any other law in force in the Territory, nothing in a provision of this Act or an instrument of a judicial or administrative character made under it limits the right of Aboriginals who have traditionally used the resources of an area of land or water in a traditional manner from continuing to use those resources in that area in that manner".

Queensland – Indigenous (management methods) for more information see https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing

CATCH CHART



.

References

Ovenden et al. 2007	Ovenden, J.R., Street, R., Broderick, D., Kashiwagi, T. and Salini, J. (2007) Genetic population structure of Black-tip Sharks (Carcharhinus tilstoni and C. sorrah) in northern Australia, in J Salini, R McAuley, S Blaber, RC Buckworth, J Chidlow, N Gribble, JR Ovenden, S Peverell, R Pillans, JD Stevens, I Stobutzki, C Tarca and TI Walker (eds), Northern Australian sharks and rays: the sustainability of target and bycatch species, phase 2, Fisheries Research and Development Corporation, Cleveland, Queensland.
Ryan et al. 2019	Ryan, K.L., Hall, N. G., Lai, E. K., Smallwood, C. B., Tate, A., Taylor, S. M. and Wise, B. S. (2019) Statewide survey of boat-based recreational fishing in Western Australia 2017/18. Fisheries Research Report No. 297, Department of Primary Industries and Regional Development, Western Australia.

Molony et al. 2013	Molony, B, McAuley, R and Rowland, F (2013) Northern shark fisheries status report: Statistics only, in WJ Fletcher and K Santoro (eds), Status Reports of the Fisheries and Aquatic Resources of Western Australia 2012/13: The State of the Fisheries, Western Australian Department of Fisheries, Perth, 216–217.
Stevens et al. 2000	Stevens J.D., West G.J. and McLoughlin K.J. (2000) Movements, recapture patterns, and factors affecting the return rate of carcharhinid and other sharks tagged off northern Australia. Marine and Freshwater Research 51: 127-41
Last and Stevens 2009	Last P.R. and Stevens J.D. (2009) Sharks and Rays of Australia. 2nd ed. Australia: CSIRO Publishing
Harry 2011	Harry A.V. (2011) Life histories of commercially important tropical sharks from the Great Barrier Reef World Heritage Area, PhD thesis, James Cook University, Townsville.
Laverly and Shaklee 1989	Laverly and Shaklee (1989) Population genetics of two tropical sharks, Carcharhinus tilstoni and C. sorrah, in northern Australia. Australian Journal of Marine and Freshwater Research 40: 541-57
Northern Territory Government 2017	Northern Territory Government (2017) Status of key Northern Territory fish stocks report 2015, Fishery report 118, Department of Primary Industry and Fisheries, Darwin.
Bradshaw et al. 2013	Bradshaw, CJ.A., Field, I.C., McMahon, C.R., Johnson, G.J., Meekan, M.G. and Buckworth, R.C. (2013) More analytical bite in estimating targets for shark harvest. Marine Ecology Progress Series, 488: 221–232.
Grubert et al. 2013	Grubert, MA, Saunders, TM, Martin, JM, Lee, HS and Walters, CJ (2013) Stock assessments of selected Northern Territory fishes, Fishery report 110, Northern Territory Government, Darwin.
Usher et al. 2020	Usher, M, Saunders, T, Braccini, M and Roelofs, A (2020) Stock status summary - 2020 Spot-tail Shark (Carcharhinus sorrah) North Australian Stock stochastic stock reduction analysis. Unpublished Fishery Report
QFISH 2020	QFish, Department of Agriculture and Fisheries, www.qfish.gov.au
Leigh 2015	Leigh, GM, 2015, Stock assessment of whaler and hammerhead sharks (Carcharhinidae and Sphyrinidae) in Queensland, Agri-Science Queensland, Department of Agriculture and Fisheries, Brisbane.
Giles et al. 2014	Giles, JL, Ovenden, JR, Dharmadi, AlMojil, D, Garvilles, E, Khampetch, K, Manjebrayakath, H, and Riginos, C (2014), Extensive genetic population structure in the Indo–West Pacific spot-tail shark, Carcharhinus sorrah, Bulletin of Marine Science 90, 427–454.
Naylor et al. 2012	Naylor GJP, Caira J, Jensen K, Rosana KAM, White WT and Last PR. (2012), A DNA sequence-based approach to the identification of shark and ray species and its implications for global elasmobranch diversity and parasitology. Bulletin of the American Museum of Natural History. 367.