

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this conservation advice on 01/10/2015

Conservation Advice

Rhincodon typus

whale shark

Conservation Status

Rhincodon typus (whale shark) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is also listed as Vulnerable on the IUCN Red List of Threatened Species (IUCN, 2013).

International fishing pressure led to a significant decline in the single, globally connected population of this species, which supported the Vulnerable listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2001 (TSSC, 2001). Ongoing threats to whale sharks, together with life history characteristics; including slow growth, late maturation and extended longevity (Colman, 1997); means the whale shark remains susceptible to declines across its international range.

Description

The whale shark is the only member of the family Rhincodontidae and the world's largest fish; the largest known whale shark measured 20 m and weighed 34 tonnes (Chen, et al., 1997; cited in Chen & Phipps, 2002). It is the only member of the family Rhincodontidae and one of only three filter-feeding shark species – the other two being the basking shark (*Cetorhinus maximus*) and the megamouth (*Megachasma pelagios*).

The whale shark is characterised by a streamlined body with a flattened, broad head. It has a very large and wide mouth, positioned at the front of the head, with approximately 300 very small teeth in each jaw (Last & Stevens, 2009). The first dorsal fin is much larger than the second. Whale sharks are greyish, bluish or brownish above, with a distinctive chequered pattern of creamy white spots between pale vertical and horizontal stripes (Martins & Knickle, 2004). The whale shark has three prominent ridges along its flanks and a spiracle (small round hole) behind each eye (Taylor, 1994; Last & Stevens, 2009). This species has five large gill-slits, which are modified to function as filtering screens as well as to extract oxygen from the water (Taylor, 1994; Last & Stevens, 2009).

Distribution

Whale sharks have global distribution in tropical and warm temperate waters. In Australia, whale sharks occur mainly off the Northern Territory, Queensland, and northern Western Australia. Isolated records exist of whale sharks off New South Wales, Victoria and South Australia (Last & Stevens, 2009).

Whale sharks form seasonal aggregations at Ningaloo Reef, Western Australia (March – July); off the coastal waters off Christmas Island (December – January); and in the Coral Sea (November – December). These seasonal aggregations are thought to be linked to localised seasonal 'pulses' of food productivity. These aggregations are all considered biologically important areas for whale sharks.

The 200 m isobath along the northern part of the Western Australian coast is an important migration route, with migration occurring mainly between July and November.

Threats

The most significant threat to whale sharks is intentional and unintentional mortality from fishing outside of Australian waters. In Australian waters, threats to the recovery of the species include boat strike from large vessels and habitat disruption from mineral exploration, production and transportation. Other less important threats include disturbance from domestic tourism operations, marine debris and climate change. Limited subsistence hunting of whale sharks still occurs in some parts of the world. Eco-tourism in these regions could provide an alternate income, which would give these communities the means to stop hunting and a reason to conserve the species.

Conservation Actions

Conservation and Management Actions

- Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations (Ningaloo Reef, Christmas Island and the Coral Sea) and along the northward migration route that follows the northern Western Australian coastline along the 200 m isobath (as set out in the Conservation Values Atlas, DotE, 2014).
- Management of all domestic tourism industry interactions with whale sharks in accordance with the *Western Australian 'Whale Shark Management with particular reference to Ningaloo Reef' Wildlife Management Program No. 57*.
- Continued advocacy of threat mitigation actions for whale sharks in international fora including, but not limited to, regional fishery management organisations.
- Support for the development of eco-tourism industries in areas where traditional hunting of whale sharks occurs.

Survey and Monitoring Priorities

- Monitoring of the Ningaloo Reef, Christmas Island and Coral Sea aggregations, and collation and dissemination of data to support analysis of population trajectory.
- Habitat critical to the survival of whale sharks in waters off Christmas Island further assessed and mapped.
- Further research on migration routes for whale sharks from Ningaloo Reef to Christmas Island.

Information and Research Priorities

- Develop greater scientific certainty around migration, habitat use, emerging threats, and population trends in Australian waters.
- Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts.
- Conduct further research into the impacts of boat strike on whale sharks to determine the significance of the threat. Consider possible mitigation actions (collision avoidance systems) if required.
- Assess environmental variables that determine whale shark presence. These can then be used to provide advice to shipping to help avoid boat strike (Lewison et al., 2015).
- Consider the implications of climate change on whale shark distribution in Australian waters (possibly through the Range Extension Database Mapping Project [REDMAP]).

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