

Global whale shark tourism: a “golden goose” of sustainable and lucrative income

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International trade in their high value meat poses a considerable threat to whale sharks. In 2002, the 12th meeting of the Conference of Parties to CITES listed the species on Appendix II in an attempt to ensure that international trade is not detrimental to their populations. The value of whale shark ecotourism, particularly for developing countries, was emphasised during the CoP12 debates.

The role of shark tourism

As management and conservation costs rise, wildlife is under pressure to pay for itself. Whale sharks *Rhincodon typus* have not escaped this expectation. Despite IUCN's Red List classification as “Vulnerable”,

(Eckert and Stewart 2001, Eckert *et al.* 2002, Graham 2003), tourism is lucky: whale sharks aggregate predictably near many coasts to feed, often on a seasonal basis (Taylor 1996, Clark and Nelson 1997, Colman 1997, Stevens *et al.* 1998, Heyman *et al.* 2001, Graham 2003). Such behaviour provides the accessibility and predictability that underpin tourism success (Taylor 1996, Davis *et al.* 2001, Newman *et al.* 2002, Alava *et al.* 2002, Graham 2003).

This predictable behaviour has also made whale sharks highly vulnerable to fisheries. Although caught incidentally in many countries, several target fisheries exist (Anon. 2002); these have proved unsustainable following dramatic declines in catch per unit effort over short time periods (Chen *et al.* 2002, Alava *et al.* 2002). Some countries have protected whale sharks (Philippines, India, USA, Mexico, Thailand, Maldives, Australia, Seychelles, Honduras) and conferred site-specific protection through establishing marine reserves that encompass predictable whale shark aggregation grounds (Ningaloo Reef, Australia; Gladden Spit, Belize; Holbox-Yucatan Peninsula, Mexico; and the Galapagos Islands, Ecuador). In many locations, enforcement of protective measures is poor with illegal fisheries taking place (Anon. 2002).



A juvenile male whale shark takes a close look at divers on the Belize Barrier Reef. Photo: Rachel T. Graham.

due in part to declines in both catch per unit effort and sightings in many areas, and the recent CITES Appendix II listing, some fisheries continue to target this threatened species (Fowler 2000, Anon. 2002). Consequently, tourism is viewed as an important means of providing States, particularly developing countries, with a sustainable source of revenue and endowing live whale sharks with value.

The rapid growth in popularity of “shark tourism” (Davis 1998, Anderson 2002) has raised awareness about sharks and has even led to some shark conservation measures being adopted (Graham 2003). Such changes in perceptions about sharks – from revulsion to fascination – coupled with increased measures for their protection are timely in light of the dramatic declines documented in global shark populations due to overfishing (Baum *et al.* 2003, Myers and Worm 2003).

Few sharks provide more emotional appeal than the whale shark. Unlike many other shark dives, viewing whale sharks does not involve baiting or feeding and is therefore closer to the “wild” experience sought by visitors. In addition to their impressive size (up to 20m long) and title of “Largest Fish in the Sea” (Chen *et al.* 1997), they have several important assets for shark encounter tourism: docile nature, planktivorous, surface feeding and relatively slow moving. Although global whale shark abundance remains unknown, and estimates hampered by their large-scale migrations

“A live shark is worth more than a dead one”

This oft repeated argument merits closer scrutiny for validation with respect to whale sharks. In Taiwan, Chen and Phipps (2002) documented whole whale sharks sold for US\$7,116 for a 2,000kg individual and US\$21,400 for a 10,000kg shark, with retail prices for meat ranging from US\$4.9–17.2kg⁻¹. By comparison, in Ningaloo Reef, Western Australia, Davis *et al.* (1997) estimated whale shark tourism revenues at Aus\$4.7 million (US\$3.1 million) for a two-month season and a more recent estimate (for 2002) is Aus\$12 million (US\$7.8 million) (W. Aus. Dept. of Cons. and Land Mngmt. pers. comm. 2003). From visitor surveys conducted in Belize in 2002, Graham

(2003) estimated the value of a six week whale shark tourism season at US\$3.7 million nationally and US\$1.35 million to the five stakeholder communities of the Gladden Spit Marine Reserve. This site on the Belize Barrier Reef hosts a seasonal congregation of whale sharks that feed on the eggs of snappers (Heyman *et al.* 2001). There are at least 12 additional sites worldwide for predictable sightings of whale sharks, (Mexico-Baja, South Africa, Mozambique, Honduras, the Seychelles, Galapagos (Ecuador), Thailand, Maldives, India, Japan, Malaysia and Philippines). With land-based tours from US\$40–266 per day and luxury live-aboard tourism worth considerably more, global whale shark tourism could be worth conservatively at least US\$47.5 million annually¹. With the exception of Australia, the majority of this revenue is captured by developing countries and presents a considerable incentive to conserve whale sharks. Populations are broadly distributed throughout the world's tropical seas with encounters confirmed in at least 120 countries (Fowler 2000, CoP12 2002) and whale shark tourism is expanding: new sites are being discovered and established sites are experiencing rapid rises in tourism (J. Ketchum pers. comm. 2002, M.C. Garcia pers. comm. 2003, M. Alava pers. comm. 2002, Graham 2003).

¹ Estimating US\$ 3million site⁻¹ yr⁻¹ based on a quarter of Australia's yearly revenue as whale shark tourism at other sites is not as developed as Ningaloo Reef.



Ascertaining a value for an individual shark is complex, particularly if the population is unknown and the shark migrates between several tourism sites. In Belize, a minimum of 106 individuals have been photo-identified, and many travel throughout the Belize Barrier Reef returning yearly to feed (Graham 2003). Using the 2002 Belize whale shark tourism survey results, each shark is worth at least US\$34,906 annually. Anderson and Ahmed (1993) recorded a similar annual value of US\$33,500 for each grey reef shark *Carcharhinus amblyrhynchos* in the Maldives. If whale sharks live to at least 60 years old, as suggested by Pauly (2002), then an individual might be worth US\$2,094,340 over its lifetime providing it repeatedly visits the tourism site. Several whale sharks tagged in Belize have moved between Gladden Spit and tourism sites in Honduras and the Yucatan, Mexico (Graham 2003), therefore producing greater revenue. If each site generates as much as Gladden Spit, then a whale shark's value could effectively be tripled to give US\$104,718 individual⁻¹ yr⁻¹ for the Mesoamerican Barrier Reef. Immigration of new individuals to Gladden Spit yearly suggests that the regional population is larger, thereby decreasing the individual value of each shark. Nevertheless, the economic argument for protecting whale sharks is undeniable.

Strict regulation is required

Although revenue from tourism is providing economic support for non-consumptive use of high-profile wildlife such as whale sharks (Davies 1990, Graham 2003), tourism is not always the panacea of wildlife conservation, as it can negatively impact the animals (Olson *et al.* 1997, Butynski and Kalina 1998, Isaacs 2000, Orams 2000, 2002). Recent declines in whale shark sightings at Gladden Spit are perhaps linked to the increase in number of divers and boats at the aggregation site. Divers have been observed to affect the courtship and spawning behaviour of aggregating snapper, thus potentially affecting whale shark predictability (Graham 2003). In the Yucatan, Belize, Australia and Donsol (Philippines), access to whale shark sites is restricted through the exclusive use of trained local guides and/or by limiting visitation. Western Australia only permits 15 licensed tour operators to conduct whale shark tours (Davis 1998). In Belize, access is restricted: only 6 boats with 14 divers each are allowed into the aggregation site during any of the day's four two-hour slots. A better understanding of the demands and pressures of wildlife tourism on target species is needed to provide management and policy guidelines to help avoid negative impacts to whale sharks. This is of particular concern at aggregation sites located near large tourist destinations.

A whale shark's ability to "pay for itself" repeatedly through tourism is clear. Moreover, tourism benefits are sustainable and more widely distributed throughout communities and range nations than through fisheries. However, the application of strict management controls are necessary to foster the sustainability of whale shark tourism, and ensure that tourism does not destroy its resource base and kill the proverbial "golden goose".

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