SYMPATHY FOR THE DEVIL

EYES ON MANTAS AND MOBULAS

By Rachel Graham and Sarah Fowler

Mantas in Hanifaru Bay, a marine protected area in the Maldives and a core site in the recently established Baa Atoll UNESCO Biosphere Reserve

CLARK MILLER

Despite increasing public attention on the plight of sharks during the past decade, many people still forget the sharks' cousins: the rays. Perhaps it's no surprise that rays don't garner as much media attention as sharks, but they likewise lag behind sharks as both subjects of scientific research and beneficiaries of legal protections.

For divers, however, few sights are more breathtaking than the graceful and majestic underwater flight of the manta ray, which can reach the remarkable size of more than 20 feet across. This animal, which plies the world's tropical seas on large muscular wings, has been poorly understood until recently. Much of what we know about manta rays has been discovered within the past decade, and today divers can predictably encounter mantas at an increasing number of dive sites.

Devil rays (as they are commonly known due to the hornlike appearance of their cephalic fins) are under an ever brighter public and scientific spotlight. The three manta ray species and their nine lookalike cousins, the mobulas, are now highly sought after, both alive and dead. Wide-ranging *Manta birostris* is the largest of the mantas; *Manta alfredi* is a smaller, more coastal species that primarily occupies the Indo-Pacific and eastern Atlantic; the third (not yet fully described) species is found primarily in the Western Caribbean and Gulf of Mexico. These 12 large and highly migratory rays all subsist on

planktonic prey and share other common traits such as longevity, late maturation and low reproductive rates.

These characteristics, combined with predictable surface-swimming behavior while feeding, have made rays particularly vulnerable to overexploitation. They generally produce a single pup after a 12-month gestation, and there may be up to five years between gestations in some species. Their brains are large relative to their body size (the largest of all sharks and rays), which implies that they are as smart as an intelligent and sociable bird, a fact that won't surprise anyone who has had a protracted encounter with a manta. Their behavior is a key driver of the growing manta tourism industry, which generates an estimated $73 million in direct revenue annually.

Differences in the habitat preferences and life cycles of these migratory rays expose them to different but overlapping threats. Coastal mantas (*M. alfredi*) and some mobulas are threatened by small-scale artisanal fisheries that use nets and harpoons in countries such as Indonesia and Mozambique; oceanic mantas (*M. birostris*) and other mobula species are further threatened by pelagic tuna purse-seine fisheries. Fisheries that target mantas intentionally seek not the animal's meat but rather its breathing apparatus — the gill plates, which are dried and sold in Asia for their supposed medicinal properties.

Studies estimate that the mortality of mobulas captured and released from tuna purse-seine nets is close to 100 percent. Reducing the threat of purse-seine capture has been tackled by the Western and Central Pacific Fisheries Commission (WCPFC), which in 2015 proposed procedures for rapid and careful release of the animals from the nets. These measures have not yet been widely implemented, and the common practice of gaff-hooking rays caught in the nets further contributes to purse-seine mortality.

Several countries, including Mexico, Indonesia, Peru, Australia, Ecuador, Maldives, Seychelles and Yap, have now enacted legislation to protect mantas, in light of dramatic declines in their numbers following the growth of fisheries that target them. Yet the gulf between legislation and actual implementation of protective measures is wide. Unsustainable fishing of mantas continues, even in countries that have protections in place.

Additional measures to reduce threats from fisheries and trade have been recently implemented through two key international agreements: the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

CMS Appendix I requires parties to the treaty to protect CMS-listed species in their country, while the complementary Appendix II encourages range states — countries through which migratory species pass — to collaborate internationally for the conservation and management of species. An example of such collaboration is the 2010 Memorandum of Understanding (MOU) on the Conservation of Migratory Sharks, which originally listed a small number of shark species in its Annex 1. In 2011, the oceanic manta was listed in both CMS appendices. This listing was followed in 2014 by the addition of the coastal manta and all nine mobulas, partly in acknowledgement that the similar appearance of unprotected devil rays could thwart protection of the giant mantas. In February 2016, participants at the Second Meeting of the Signatories to the MOU on the Conservation of Migratory Sharks added all species of mantas and mobulas (and some more sharks) to Annex 1 and adopted a revised conservation plan (Annex 3) for 2016-18 that will improve our knowledge of both the species and the fisheries.

CITES prohibits commercial trade in species listed in its Appendix I (most endangered), establishes processes for ensuring that trade in its Appendix II species is sustainable and has the capacity to impose sanctions if parties fail to comply. CITES listed all mantas in Appendix II in 2013, recognizing that fisheries driven by international demand for gill plates caused stock depletion. CITES Appendix II requires exporting countries to confirm that exports of listed species were obtained legally (e.g., not taken from protected areas or using illegal fishing gear) and that the harvest from the wild population was sustainable, among other things. In September 2016, parties will debate adding all the mobulas to CITES Appendix II, partly because some species face the same threats and also because of "lookalike" issues, which can undermine the protection of the most threatened species if their products (i.e., gill plates) cannot be differentiated.

These international conservation measures are timely, providing hope that it will be possible to reverse declines in several known manta/mobula fisheries and mitigate threats from other not-yet-fully-described fisheries. Furthermore, the International Union for Conservation of Nature (IUCN) Global Devil and Manta Ray Conservation Strategy, developed by manta experts in Durban, South Africa, in 2014, will soon be released to guide research and conservation priorities and drive future conservation and collaborative efforts for all devil rays.

The considerable advances made worldwide in the research and conservation of mantas and mobulas are encouraging. It is clear that we are finally beginning to show much deserved sympathy to these devils of the sea. This is no time for resting on laurels, however; we need to move faster and more efficiently to mitigate the multiple threats to these magnificent marine icons so their populations may thrive once again. AD