



Sharks on the reef

Background reading for teachers

This reading gives you the science behind each slide, with sources you can check. The big idea of the lesson is connection: every animal on a reef depends on others, and losing one can affect many.

Residents and visitors

Over the last ten years, MCP volunteers have helped record a big increase in sightings of sharks and rays on the reefs around Zamboanguita. Bamboo sharks have been seen five or more times at Latason and Lutoban marine protected areas, and are probably the same two resident animals. Because resident species like bamboo sharks don't travel far, their return is a good sign for the local reef. Whale sharks and manta rays are travellers, so more sightings of them may say more about changes in the wider ocean, including warming, than about the reef itself.¹

Food chains and webs

Producers (seagrass, algae and the plant plankton) make their own food using sunlight. Grazers eat producers, predators eat other animals, and top predators have few or no natural enemies. A food web is many food chains joined together. The species cards are simplified, but every link on them is a real feeding relationship.

Sharks and rays have different jobs

Tiger sharks are top predators that eat almost anything, including sea turtles. Blacktip reef sharks chase small fish in the shallows. Brownbanded bamboo sharks hide in reef crevices by day and hunt crabs and small fish at night.⁸ Whale sharks and manta rays are filter feeders. Stingrays feed on animals buried in sand.

The Shark Bay story

Since 1997, the Shark Bay Ecosystem Research Project in Western Australia has studied tiger sharks and their prey in one of the least disturbed seagrass systems in the world. Tiger sharks prefer to cruise the shallow seagrass beds, so dugongs, turtles and other prey avoid these areas and don't make full use of the food there.² The researchers found that tiger sharks affect where their prey go and how they feed, mostly through fear rather than by eating them, and they are testing whether these effects reach down to the seagrass.³ In Bermuda, where tiger sharks have declined sharply, observations suggest turtle numbers may be growing fast enough to damage seagrass. The researchers' conclusion is that protecting turtles and other grazers works best alongside protecting their predators.²

What about coral reefs?

The Global FinPrint survey used underwater cameras at 371 reefs in 58 countries. Sharks were not seen on nearly 20% of them, which the scientists describe as functionally extinct: too rare to play their normal role. The biggest cause was overfishing, especially with longlines and gillnets. Places with more sharks tended to be well governed and either banned shark fishing or had strong, science-based catch limits.⁴ A

follow-up study found that five common reef shark species had declined by 60 to 73% worldwide, and that rays have begun to take over where sharks have gone.⁵ What losing sharks does to coral itself is still being studied, so the lesson presents it as an open question.

When scientists change their minds

A 2007 study linked the overfishing of large sharks off the US east coast to a boom in cownose rays and the collapse of a scallop fishery.⁶ It became a famous textbook example. In 2016, a re-examination found that the timing of the shark declines and the ray increases did not match, and that the evidence for the chain of events was missing.⁷ It is a useful example of science correcting itself.

The quiz species

Red List status, from the IUCN Red List:^{8, 9} whale shark, Endangered. Tiger shark, Near Threatened. Brownbanded bamboo shark, Near Threatened. Scalloped hammerhead, Critically Endangered since 2019. Reef manta ray, Vulnerable (a female usually has one pup every two to three years).¹⁰ Blacktip reef shark, Vulnerable.

Sources

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