



## New data collection and management tools for sharks and rays

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*A lack of basic information on sharks and rays, and on practical approaches to limit their catches, remains an ongoing issue for fisheries managers in many Pacific Island fisheries and beyond. In response, James Cook University and the World Wide Fund for Nature have recently released a rapid assessment toolkit, and a guide to spatial protection, specifically designed for sharks and rays. These tools aim to support the development of sustainable fisheries management, and the conservation of threatened species.*

Twenty years have passed since the launch of the International Plan of Action for Conservation and Management of Sharks.<sup>2</sup> While there has been considerable progress since then, many fisheries that take sharks – whether targeted or as bycatch – lack basic data and species-specific management. The situation is complicated by the great diversity of species and associated life-histories, with 507 species of sharks and 646 species of skates and rays now recognised.

Global catches of sharks and rays peaked in 2003,<sup>3</sup> and have generally declined since then. A landmark 2014 study found that one out of four species were threatened with extinction,<sup>4</sup> with many populations continuing to decline. The status of the shortfin mako shark has recently been downgraded to ‘endangered’ by the International Union for Conservation of Nature’s Red List, while giant guitarfishes and wedgefishes are now more threatened with extinction than

sawfishes.<sup>5</sup> The latest Western and Central Pacific Fisheries Commission stock assessment for oceanic whitetip shark found that the spawning biomass had likely declined more than 95%.<sup>6</sup>

While the ecological roles of many elasmobranchs are not fully understood, it is clear that some are apex predators, and collectively they provide a diverse array of ecosystem functions. Conserving them is key to enhancing an ecosystem’s resilience to climate change. Losing these species deprives coastal communities in many countries of livelihood, food and tourism opportunities.

Effective spatial protection of critical habitats is one of the most practical and enforceable ways of reducing fishing mortality of elasmobranchs. It can also provide substantial benefits for sustainable fisheries management at national

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<sup>2</sup> See: <http://www.fao.org/ipoa-sharks/en/>

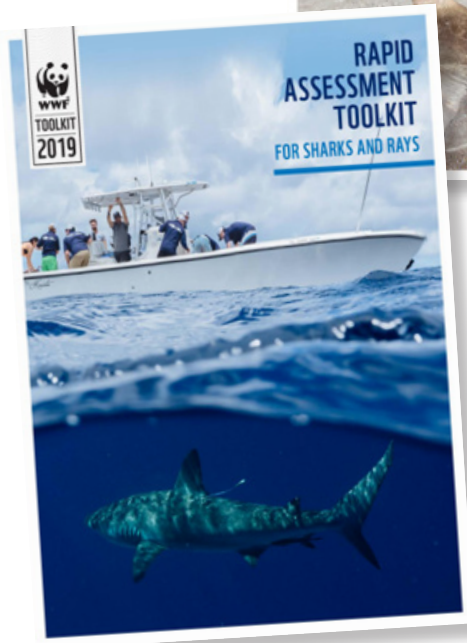
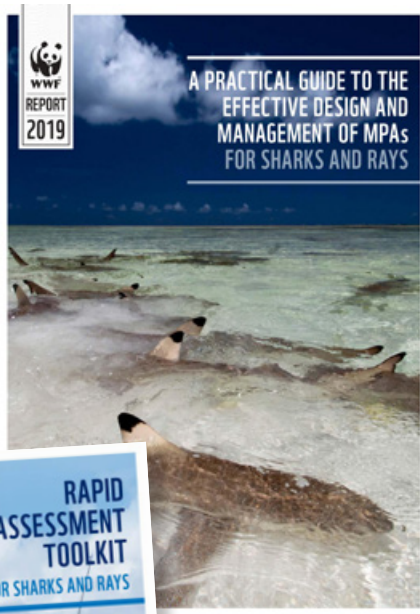
<sup>3</sup> <https://elifesciences.org/articles/00590>

<sup>4</sup> <https://elifesciences.org/articles/00590>

<sup>5</sup> <https://www.iucnssg.org/press.html>

<sup>6</sup> <https://www.wcpfc.int/node/42932>

and regional levels as well as for biodiversity conservation. With only 38 shark protection areas globally as of 2018, and thousands of fisheries taking sharks with little or no shark-specific management, there is great potential for spatial protection to be more routinely employed. One particular area ripe for growth is the use of spatial protection in conjunction with bycatch mitigation and other approaches to move fisheries that take sharks towards sustainability.



*A practical guide to the effective design and management of MPAs for sharks and rays (image: naturepl.com, Cheryl-Samantha Owen / WWF), and the Rapid assessment toolkit for sharks and rays (image: Beneath the Waves / Diego Camejo).*

To assist marine resource managers, the Centre for Sustainable Tropical Fisheries and Aquaculture (CSTFA) at Australia's James Cook University, and WWF have collaborated to produce 'A practical guide to the effective design and management of MPAs for sharks and rays' (MPA Guide)<sup>7</sup> as well as a 'Rapid assessment toolkit for sharks and rays' (RAT Toolkit).<sup>8</sup>

A practical guide to the effective design and management of MPAs for sharks and rays (image: naturepl.com, Cheryl-Samantha Owen/WWF), and the Rapid assessment toolkit for sharks and rays (image: Beneath the Waves/Diego Camejo).

The MPA Guide builds on the most comprehensive global analysis to date of the effectiveness of shark-focused protected areas by the James Cook team. The guide also incorporates known information on the movement patterns of different shark species. Advice included in the guide can be retrofitted into already existing protected zones, or used when designing new spatial protection from scratch. The guide specifically advises on the best ways of:

- involving local stakeholders,
- monitoring and evaluation,
- accounting for shark and ray movement patterns,
- protecting critical habitats, and
- reducing fishing-related mortality.

As the research shows, the effectiveness of spatial protection for sharks and rays depends on the overlap between the protected area, the animals' movements, and critical habitats. As these vary widely by species, spatial protection proves to be more effective for some shark and ray species than others.

For highly mobile, pelagic species, dynamic spatial and temporal protection might be more appropriate, leaving room for greater management flexibility. Although spatial protection has rarely been applied to high-seas management, it could be a useful approach for pelagic fisheries where bans on capture and retention, combined with safe handling and release practices, are not sufficient to prevent ongoing population declines, such as with oceanic whitetip sharks.

Another key factor for the success of spatial protection is taking into account socioeconomic and cultural factors; that is, ensuring that all relevant stakeholders, particularly local communities, are included in the conservation and management plans from as early on as possible. It is essential to engage them to build trust, respect and support, and to ensure that local communities benefit from these fishery management and conservation measures – only then can spatial protection be successful for both people and sharks.

With nearly 50% of all described elasmobranchs lacking population and conservation status data, the RAT Toolkit aims to address the issue and help plug this gap by offering

<sup>7</sup> MPA Guide (download pdf): <https://sharks.panda.org/tools-publications/marine-protected-areas>

<sup>8</sup> RAT Toolkit (download pdf): <https://sharks.panda.org/tools-publications/rapid-assessment-toolkit>





Waisomo villagers prepare to drop anchor for a buoy marking Fiji's first shark-focused marine protected area. (Image: Meg Gawler / WWF)



A baited remote underwater video (BRUV) system being prepared, Pacific Harbour, Viti Levu, Fiji. BRUV is a method of monitoring the marine environment by using bait to attract fish into the field of view of a video camera. (Image: Marcel Keurntjes / WWF-Netherlands)

simple and practical tips for collecting scientific data. The absence of basic information continues to hinder better management, with many coastal fisheries lacking the necessary data to protect declining shark and ray populations and manage fisheries sustainably.

The RAT Toolkit allows for the selection of appropriate tools, depending on the knowledge gap of the particular waters where it may be used. Six tools developed for this publication consist of 'how-to' guidance written by respected experts in the fields of taxonomy, genetics, creel and market surveys, baited remote underwater video systems (BRUVS), tagging and tracking, and citizen science.

Data can be gathered quickly and easily thanks to these tools, which can help fishery managers and national authorities accurately determine the true state of their coastal environments and subsequently conserve and manage shark and ray populations sustainably.

Quality species-specific data collected by applying the tools can be used to produce Shark Assessment Reports and National Plans of Action (NPOA-Sharks) as well as Non-Detriment Findings (NDFs) for sharks and rays listed on CITES Appendix II. Many shark and ray populations face an uncertain future. With a growing urgency to develop NPOA-Sharks by shark fishing nations, and trade controls already in place for a number of species, our RAT Toolkit will help fishery managers and authorities to easily gather all the data needed to manage and conserve elasmobranchs sustainably.

Soft copies of both publications can be found on WWF Sharks website at:

<https://sharks.panda.org/tools-publications>.

**For more information and to request hard copies:**

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