

Logging the biodiversity and significance of sharks and rays in the Pacific

Sharks and rays are important to Pacific peoples. They are caught in coastal fisheries and in some places are used as meat and even for products made from their skin. For many more coastal fishers, shark fins are valuable products that provide important cash income. For the industrial tuna fisheries, sharks are important parts of fishery operations, either in terms of supplementary income as byproducts, or in the need to manage bycatch. Sharks and rays are also important as living resources to dive tourism, such as the famous bull shark dive at Shark Reef in Fiji, stingrays and sharks in Bora Bora and Moorea in French Polynesia, Palau's famous shark dives, or shark diving at Osprey Reef in the Coral Sea. And sharks also have value that goes beyond money or food. For some Pacific peoples, sharks are important parts of their culture and identity, and may have spiritual qualities.

However, scientific knowledge about sharks in the Pacific is still quite limited. While research has been done on some species (mainly species that interact with tuna fisheries), we know very little about most of the other sharks and rays in our Pacific waters. For example, then University of Papua New Guinea (UPNG) has a specimen of *Gogolia filewoodi*, the Gogol River shark, in its fish collection. There are only two known specimens of this species in the world, and everything we know about the species comes from those two specimens. More recently, scientists have found that *Neotrygon kublii* (Müller and Henle, 1841), the commonly seen banded maskray is actually a complex of *four* different species with three new species being described (Last et al. 2016). In November 2014, sharks thought to have been 'lost' from Papua New Guinea were rediscovered by researchers surveying catches in a village (White et al. 2015). Of course, the fishers knew these sharks, but with so few surveys being done, they had been unrecorded. Then in 2015, a National Geographic expedition found sharks swimming in the hot acidic waters of the Kavachi underwater volcano (Phillips et al. 2016). Later in 2015,

we received a photograph of a sawfish rostrum taken in the Solomon Islands in the 1960s. After checking with experts, this photo extended this species' range to the Solomon Islands. The more we look, the more we find.

A new project on sharks and rays in the Pacific

It is in this spirit of this discovery that a new project will be launched in March 2017. Shark Search Indo-Pacific (SSIP) is an independent project that aims to provide an accurate and scientifically verified checklist of the shark and ray diversity of every country and territory in the Western and Central Pacific by 2022. Each checklist will contain the up-to-date species names, data sources for each country, conservation information such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Western and Central Pacific Fisheries Commission (WCPFC) conservation information, as well as the IUCN Red List category. The checklist will also include basic life history information for each species, and an assessment of relative productivity. Each checklist will be accompanied by a brief synthesis report of the status and pressures on sharks and rays in each country.

While the checklists will be compiled through a desktop study, **Citizen Scientists** – underwater photographers and fishers from across the Pacific – are also being encouraged to get involved. Divers are being asked to check the Shark Search Indo-Pacific website (www.sharksearch-indopacific.org) to see if they have photos of sharks and rays that have not been listed for a specific country (there is a separate page for every country and territory in the Pacific). If a diver has photos of species that aren't already listed, they should send them to the project team. These photos are essential for verifying the presence of species in a country or location, especially for sharks and rays that don't turn up in fisheries catch records. Maybe one day these photos could be used to produce a field guide to the sharks and rays of the Pacific.



Gogolia filewoodi paratype specimen at UPNG (image: Andrew Chin).

Once each checklist is completed and verified, the checklist and the synthesis report is placed on the SSIP website so that it is freely accessible to anyone who needs this information. For checklists and synthesis reports that are published as scientific papers, these will be classed as open access to make sure people can freely download the information.

The SSIP checklist process

It is crucial that each checklist is scientifically accurate and robust, so a lot of attention is paid to quality checking each product. Each checklist project begins by gathering together a group of In-country Partners who will help make sure that the checklist contains the best information, and helps to inform people and agencies that may need the information about the checklist project. The In-country Partners would also help to review the draft checklist and synthesis to ensure they are correct. The checklist process also involves taxonomic experts who make sure that species are identified correctly and that taxonomic information is up-to-date. The taxonomists also check international museum databases to see if any sharks and rays have been collected from that country in previous years. This is a big job and most of the research is done by graduate students who use the checklist projects as a part of their Master's degree. Each student is assigned a specific country and, under supervision, will be responsible for putting the checklist together. In this way, a very big task is divided among many hands, and the students get experience in carrying out applied literature research and learn about Pacific fisheries and conservation and management tools such as WCPFC Conservation Management Measures, CITES and CMS.

The first checklist – Solomon Islands – has been completed and has been submitted as a scientific paper. The SSIP team hopes that this will be the first of many more checklists for the Pacific.

Looking forward

SSIP is starting off as a small, voluntary, student driven project. However, the long-term vision is that SSIP will provide the basic information that countries need to document their shark and ray resources, in order to meet reporting obligations under the Convention on Biological Diversity, or to help develop National Plans of Action under the FAO guidelines. Each checklist and synthesis will also provide a snapshot of the main trends and issues affecting shark and ray resources, and provide a starting



The SharkSearch Indo-Pacific website homepage (www.sharksearch-indopacific.org).

point that the project team and In-country Partners can use to plan future projects. SSIP focuses on collaboration and by working together, the project hopes to, piece-by-piece, build a more complete picture of the diversity, significance and status of sharks and rays across the Pacific.

References

- Last P.R., White W.T. and Seret B. 2016. Taxonomic status of maskrays of the *Neotrygon kuhlii* species complex (Myliobatoidei: Dasyatidae) with the description of three new species from the Indo-West Pacific. *Zootaxa* 4083:533–561.
- Phillips B.T, Dunbabin M., Henning B., Howell C., DeCiccio A., Flinders A., Kelley K.A., J. Scott J.J., Albert S., Carey S., Tsadok R. and Grinham A. 2016. Exploring the “Sharkcano”: Biogeochemical observations of the Kavachi submarine volcano (Solomon Islands). *Oceanography* 29, doi:<https://doi.org/10.5670/oceanog.2016.85>.
- White W.T., Appleyard S.A., Sabub B., Kyne P.M., Harris M., Lis R., Baje L., Usu T., Smart J., Corrigan S., Yang L. and Naylor G.J.P. 2015. Rediscovery of the threatened river sharks, *Glyphis garricki* and *G. glyphis*, in Papua New Guinea. *PLoS ONE* 10, e0140075, doi:[10.1371/journal.pone.0140075](https://doi.org/10.1371/journal.pone.0140075).

For more information:

Dr Andrew Chin
Centre for Sustainable Tropical Fisheries and
Aquaculture, James Cook University, Australia
sharksearch.indopacific@gmail.com