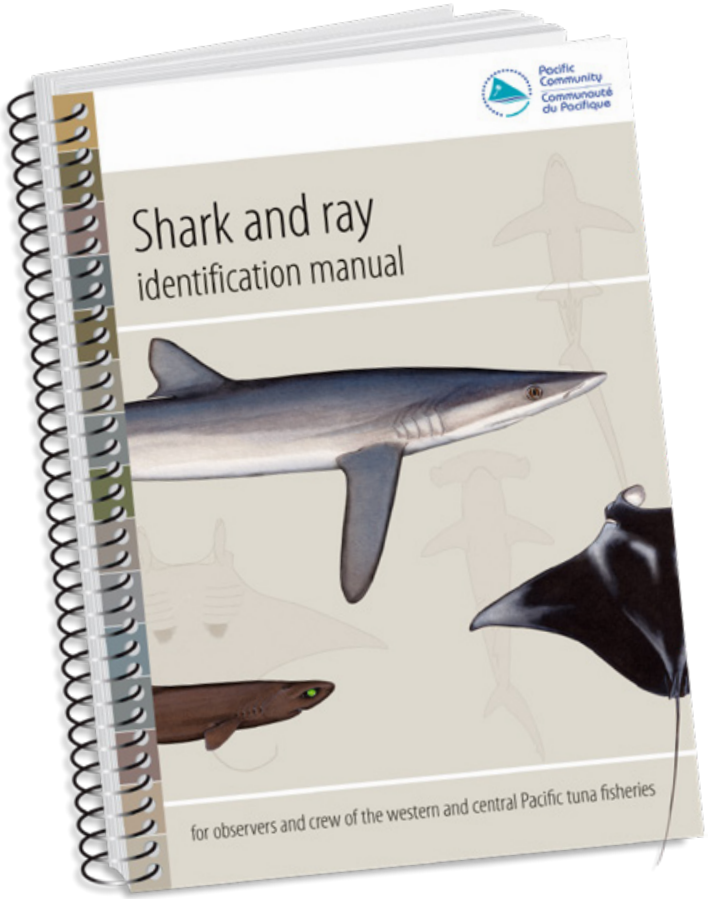
Release of new shark and ray identification manual

The Pacific Community (SPC) has just released a new shark and ray identification manual detailing 44 species of pelagic sharks and rays encountered in tropical tuna fisheries.[1] The manual features a completely new set of colour illustrations by renowned shark and ray scientist and scientific illustrator Dr Lindsay Gutteridge (née Marshall), of Stick Figure Fish fame. Lindsay's previous work includes 633 illustrations for the book "Rays of the World"[2] published by the Commonwealth Scientific and Industrial Research Organisation and over 1200 illustrations for the online "Chondrichthyan tree of life" project[3]. She also developed a fin morphology protocol for identifying shark species, and produced "Shark fin guide – Identifying sharks from their fins"[4] for the Food and Agriculture Organization of the United Nations.



Description of the manual

SPC's "Shark and ray identification manual" is intended to be used as a field guide for more accurate identification of shark species for Pacific Island fisheries observers and tuna vessel masters to improve their catch reporting.

The guide includes three main sections:

1. A dichotomous identification key that uses a series of steps of paired alternative anatomical descriptions with illustrations that identify or contrast a feature that is reliable (always found in live and dead forms and both sexes of the species), consistent (present throughout the year and across the range), and clear or measurable. Each couplet is a branch that either subdivides the remaining species into two groups or identifies one species from the remainder. Use of the key features should become a routine manner when identifying shark and ray species, and then confirmed with the detailed illustrations in the following section.

2. The 44 species of pelagic sharks and rays have been carefully illustrated to show the key features as well as their natural colours when alive, for use on board a vessel at the time of capture. The species are in the same order as they are identified in the identification key, with the most similar species placed on opposing pages to help with a visual comparison of characteristics, and are grouped into families.

Each page of these two sections also provides:

- the scientific and common English names of the species, and of the family it belongs to;
- a reference to the chain of specific keys used to identify the species;
- further obvious characteristic features that distinguish the most similar species;
- vernacular names in six other languages – Cantonese, French, Japanese, Korean, Mandarin and Spanish – to facilitate communication between observers, crew and other fisheries agency field staff; and
- a figure to compare the maximum known size of each species with that of a six-foot tall human as some similar looking species have significant size differences.

[1] https://coastfish.spc.int/en/component/content/article/44-handbooks-a-manuals/507-shark-and-ray-identification-manual
[2] https://www.nhbs.com/rays-of-the-world-book
[3] https://sharksrays.org/
[4] http://www.fao.org/3/a-i5445e.pdf

3. Shark and ray handling guidelines, with illustrations, to inform crew and observers of best-practice handling methods recommended by the Western and Central Pacific Fisheries Commission (WCPFC) for the release of sharks and rays to minimise injury to sharks, rays and crew. This will also assist observers reporting on the fate, condition and method of release for the key shark species.

There is also a glossary of terms and an illustrated glossary to define terms used in the identification key.

Why do we need a new "Shark and ray identification manual"?

Bycatch species are those species of marine animals that are not targeted to be caught for sale but may be incidentally caught. Bycatch species that are discarded because they are unwanted or regulated as protected species tend to be poorly reported in catch logs so their actual regional catch is not well documented. Sharks and rays are a significant part of tuna fisheries' discarded bycatch and some shark and ray populations appear to be significantly impacted by tuna fisheries. This impact is exacerbated in species with traits of being apex predators or having a long life span and low fecundity, which makes large shark and ray populations vulnerable to fishing.

Fisheries scientists require accurate and timely data on catch and fishing operations to accurately assess the state of a species' population status. Fundamental to accurate shark and ray catch estimates is the reliable identification of their species.

SPC's previous shark identification guide comprised 30 species of sharks and rays, the new manual comprises 44 shark and ray species that are impacted by tuna fisheries. The additional species are included to further improve their identification and refine shark identification accuracy. Some of

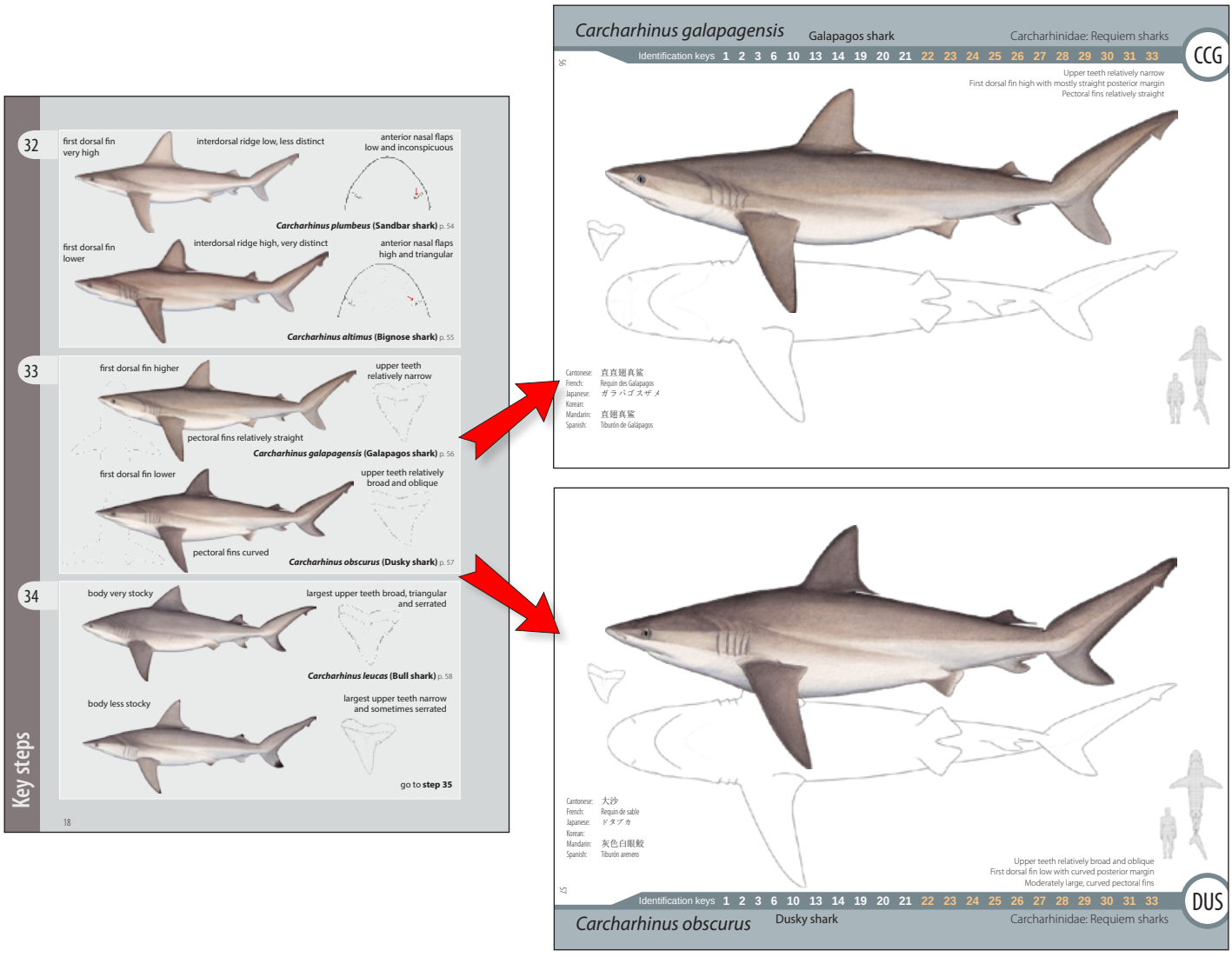


Figure 1. Following the key steps (left) allows the user to properly identify 44 species of tropical shark and ray species.

these have also recently become regulated species by the WCPFC, requiring further reporting of catch by species.

This manual features a completely new set of improved illustrations with more accurate anatomy and colour detail, and ventral line illustrations showing otherwise "hidden" features. This is a significant improvement over the illustrations used in the previous pocketsize guide produced in 2005 by SPC, titled "Shark identification in tropical offshore fisheries".[5]

What is featured?

The 44 shark and ray species in this manual include species with adaptations to being pinnacle predators, huge planktonic feeders or small parasitic predators of large pelagic fish and mammals. These species are included because they are impacted by the tuna fishery when they are caught incidentally, or are set on because of their association with tuna, or interact through depredation (feeding on) of the target catch in the western and central Pacific Ocean (WCPO) pelagic tuna fisheries.

Importance and special designation

Owing to the impact of tuna fisheries on pelagic shark and ray populations, WCPFC has designated 14 shark species and six mobulid species as key shark species (for data provision). Vessels fishing in the WCPO and fisheries observers are required to report their catch for each of these 14 key shark species.

Furthermore, some of these key shark species have been designated as Species of Special Interest. The shark and ray species that are of special interest are the oceanic whitetip shark, the silky shark, the whale shark and six species of mobulid rays (manta and devil rays). These are regulated as no-catch species (oceanic whitetip and silky sharks), no-intentional-set-on by purse-seine vessels (whale shark), and all require that specific data be collected by observers, including location, length, sex, fate and condition. Observers should also record their interactions with the primary fishing gear (line or net).

How will the manual be used?

SPC's "Shark and ray identification manual" will be used for observer training. In particular, the use of an identification key as a tool is a new method for species identification by Pacific Island Regional Fisheries Observers. Introducing the identification key process in observer training will standardise the process and improve transparency of species identification by observers. The identification process and best practice handling guidelines will, hopefully, become adopted with the distribution of the guide and advice of flag-state agencies

When will it be distributed?

The "Shark and ray identification manual" will be printed and distributed in early 2020. Distribution will initially be to national and regional fisheries agencies and fishing companies operating in the WCPO.

Acknowledgements

Verification of species names, the identification key, and accuracy of the illustrations were provided independently by Dr William White (Commonwealth Scientific and Industrial Research Organisation, Australia) and Dr Malcolm Francis (National Institute of Water and Atmospheric Research, New Zealand).

Translations of commonly used vernacular names were provided by Dr Nan Yao, (Cantonese and Mandarin), Dr Yukio Tekeuchi and Dr Ken Okaji (Japanese), Dr Seonjae Hwang (Korean) and extracted from the FAO AFSIS list of species (English, French and Spanish).

The manual was compiled by SPC staff: Tim Park (Observer Programme Advisor), Aymeric Desurmont (Fisheries Information Specialist), Boris Colas (Technical Assistant – Graphic Design) and Neville Smith (Director, Division of Fisheries, Aquaculture and Marine Ecosystems).

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Renown Australian artist Dr Lindsay Gutteridge (née Marshall) painting a shark species.

[5] http://www.spc.int/coastfish/index.php?option=com_content&Itemid=30&id=354