



Anal Fin Guide

Using a secondary fin to
identify species occurring in
Western Caribbean shark fisheries

This guide was developed in collaboration with the shark fishers and Fisheries Department of Belize, Central America and published in conjunction with *Using fisher-contributed secondary fins to fill critical shark-fisheries data gaps.*

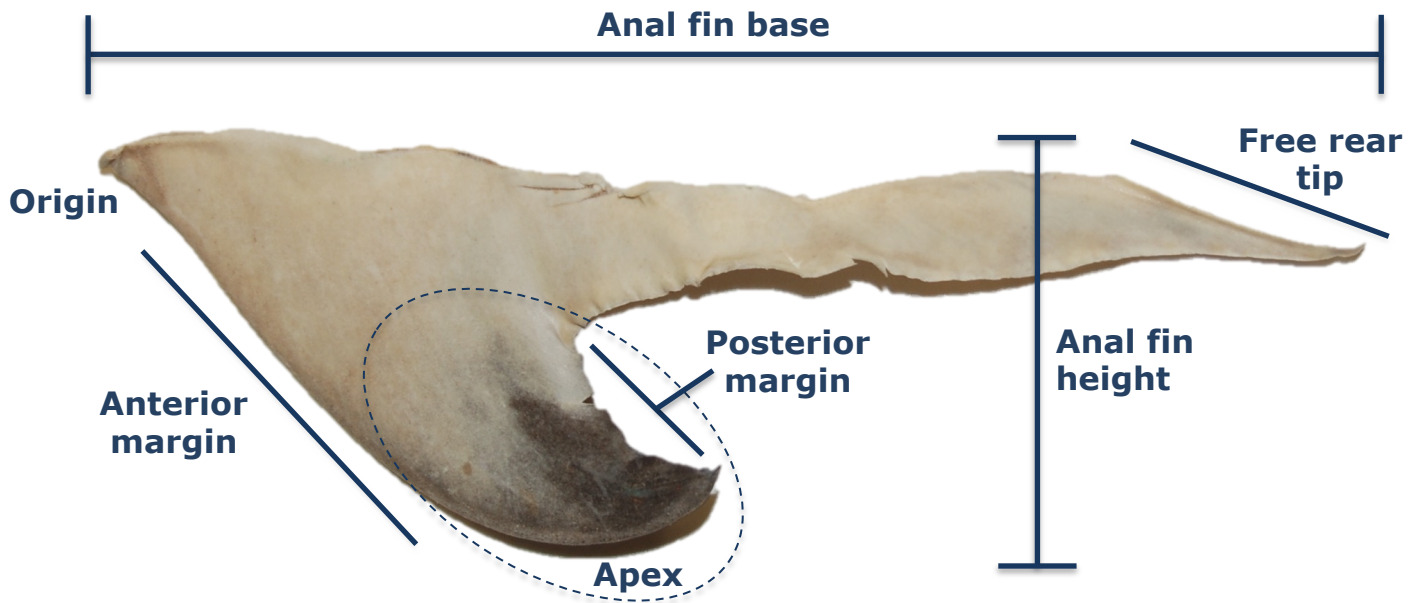
It is intended to aid shark fishery managers in the Western Caribbean to identify species occurring in their shark fishery, with only the use of the animal's anal fin. Collecting species-specific data for a fishery is paramount to begin managing it.

Authors:

Jessica Quinlan

Demian Chapman, Ph.D.

Anal Fin Diagram & Terminology



Origin: where the anal fin begins anteriorly on the shark's body

Anal fin base: distance from origin to the end of the free rear tip

Free rear tip: part of the anal fin not directly connected to the body

Anal fin height: straight line distance from base to most distant extension of the apex

Posterior margin: edge of the anal fin most posterior on the shark's body

Apex: extension of the anal fin distally

Anterior margin: edge of the anal fin most anterior on the shark's body

The anal fin is a single fin located on the ventral side of the shark, it is the last fin before the caudal.

Common species



Caribbean Reef (*Carcharhinus perezi*)

Apex: narrow, rounded
Height/Base ratio: approx. equal
Free rear tip: present
Color: brown to grey, transitioning to a noticeably dusky apex
Texture: smooth
Details: has distinct shimmer unlike any other species, smaller fins may be lighter in color but have the same pattern.



Blacktip/ Blacknose (*Carcharhinus limbatus*/ *C. acronotus*)

Apex: moderately broad, pointed
Height/Base ratio: approx. equal
Free rear tip: present
Color: white/ off-white
Texture: smooth
Details: occasionally fins will have pale grey speckles or patches. Small and large fins are alike.



Sharpnose (*Rhizoprionodon spp.*)

Apex: broad, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: white, dusky apex (not always present)
Texture: smooth
Details: small and large fins are alike.

Bonnethead
(*Sphyrna cf. tiburo*)



Apex: broad, pointed
Height/Base ratio: height < base
Free rear tip: present
Color: white
Texture: smooth
Details: point on apex can be inconspicuous in smaller fins, small and large fins alike.

Great/ Scalloped Hammerhead
(*Sphyrna mokarran/ Sphyrna lewini*)



Apex: narrow, strongly falcate (hook shaped)
Height/Base ratio: height < base
Free rear tip: present
Color: variable
Texture: smooth
Details: color changes between species and among sizes within each species; not a reliable character. The only 2 species with a strongly falcate apex.

Tiger
(*Galeocerdo cuvier*)



Apex: narrow, pointed
Height/Base ratio: approx. equal
Free rear tip: present
Color: brown to grey, sometimes mottled
Texture: very rough
Details: Small and large fins are alike.



Lemon
(*Negaprion brevirostris*)

Apex: moderately narrow, rounded
Height/Base ratio: approx. equal
Free rear tip: present
Color: yellow around base, transitioning to brown on the apex
Texture: smooth
Details: apex and posterior margin generally have uneven scalloped edge, very smooth and shiny along anterior margin. Small and large fins are alike.



Silky
(*Carcharhinus falciformis*)

Apex: narrow, very rounded (almost oval)
Height/Base ratio: height < base
Free rear tip: present
Color: grey to dark grey, very dark apex
Texture: smooth
Details: free rear tip is present and very long. Small and large fins are alike.



Bull
(*Carcharhinus leucas*)

Apex: moderately narrow, rounded
Height/Base ratio: approx. equal
Free rear tip: present
Color: grey
Texture: rough
Details: larger fins are very smooth and shiny along anterior margin. Smaller fins are white/pale at base and progress to dark grey at apex.

Rare species



Atlantic sixgill
(*Hexanchus vitulus*)

Apex: broad, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: white to grey
Texture: very smooth
Details:



Night
(*Carcharhinus signatus*)

Apex: moderately broad, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: pale grey
Texture: smooth
Details: can look similar to blacktip/blacknose, but will be fully pale grey, not speckled.



Shortfin mako
(*Isurus oxyrinchus*)

Apex: moderately broad, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: pale grey to light brown, can have white patches
Texture: smooth
Details:

Spinner
(*Carcharhinus brevipinna*)



Apex: narrow, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: white, with sharply demarcated black apex
Texture: smooth
Details:

Dogfish
(*Mustelus spp.*)



Apex: moderately broad, rounded
Height/Base ratio: height < base
Free rear tip: present
Color: white to pale grey
Texture: very smooth
Details: glossy texture, unlike any other genus.

Regression Equations

Species-specific regression equations allow users to convert anal fin base measurements (mm) to inferred total lengths (cm). It is important to note that when applying the regression equations, the anal fin measurements must be in millimeters (mm) and the output will produce a total length in centimeters (cm). Species-specific regression equations should only be applied to their intended species. The accompanying *Anal Fin Monitoring Program User Manual* outlines how to correctly apply the species-specific regression equations to anal fins that should be included in the analysis. Furthermore, it also outlines how to correctly collect the measurements needed to develop a species-specific regression equation for species which do not already have one.

The Anal Fin Monitoring Program is intended to be a collaborative effort where measurements and regressions are collected and developed uniformly and can be shared amongst users. This guide should be used in combination with the *Anal Fin Monitoring Program User Guide*.

As more data are collected, the *Anal Fin Guide* and species-specific regression equations are continuously updated. To ensure you are using the most up to date materials, please contact: Jessica Quinlan, email: Fins4Science@gmail.com

Table: Species-specific regression equations

Species	Equation	r ² value	n	Date modified
C. perezi	$y = 1.2472x + 11.148$	0.93	87	3/16/2022
C. limbatus	$y = 1.1153x + 6.9452$	0.93	80	3/16/2022
Rhizoprionodon spp.	$y = 1.0088x + 12.754$	0.80	115	3/16/2022
S. tiburo	$y = 0.8249x + 11.125$	0.88	93	3/16/2022
C. falciformis	$y = 1.2011x + 17.646$	0.92	36	3/16/2022