6th Edition
128 fish species
Images and videos

SharkCam Fishes

A Guide to Nekton at Frying Pan Tower

Erin J. Burge and Elle S. Harris

with contributions from Christopher E. O'Brien and jon-newbie

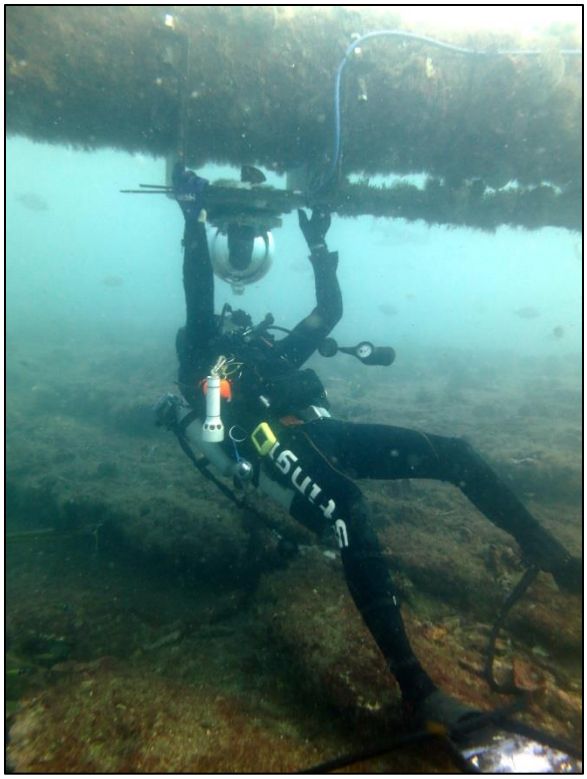
Trevor Mendelow, designer of SharkCam, on August 31, 2014, the day of the original SharkCam installation. Image credit: Erin Burge

Burge EJ, ES Harris. 2021. SharkCam Fishes. A Guide to Nekton at Frying Pan Tower. 6th edition. Los Angeles: Explore.org Ocean Frontiers. 230 pp. *Available online* http://explore.org/live-cams/player/shark-cam.

Guide version 6.0. 17 December 2021.

TABLE OF CONTENTS

FOREWORD AND INTRODUCTION



Jim Atack inspecting the new high definition SharkCam 3.0 on September 10, 2016. Image credit: Erin Burge

Frying Pan Tower on a calm day on the Atlantic. Image credit: Erin Burge

Welcome to our sixth edition of the guide to fishes seen on the Cape Fear SharkCam.[1] SharkCam is a solar-powered underwater camera installed 50 feet (15 meters) below the surface of the Atlantic Ocean. It live-streams on Explore.org, a project of the Annenberg Foundation.[2] The camera is mounted on the Frying Pan Tower,[3] a former U.S. Coast Guard Light Station located atop a natural hard bottom reef area approximately 35 miles (56 kilometers) off the coast of Cape Fear, North Carolina.[4] The area supports a huge diversity of marine life including, as the camera and guide's names suggest, sharks.

Our purpose in presenting this guide is to help viewers attach names to the many species of fish (and some non-fish) seen on SharkCam. We expect that learning the names of the fishes seen will enhance the viewer's appreciation for the ocean's denizens in two ways. First, it will make a more personal connection to them. It will no longer be just a fish; it will be that queen angelfish, nicknamed Dragon, with an unusual forehead notch. It won't be just a shark; it will be that sand tiger shark called Tippy. She's missing a part of her caudal fin. Second, the process of naming enables access to additional information about the amazing lives of animals beneath the waves and, ultimately, their connections to our own. Besides, we find it fun to be able to name the fish as we see them and we hope you will, too!

"We" are Dr. Erin J. Burge and Elle S. Harris (known as Pilotfish on the discussion forum for SharkCam). Erin is a Professor of Marine Science at Coastal Carolina University,[5] was an installer of the original and current SharkCam, and is the originator of this guide. Erin is a SharkCam Disqus moderator and frequent contributor to discussions on the SharkCam forum. Elle Harris has been a regular viewer of SharkCam since her freshman year of high school. A prospective marine biologist, she made a hobby of watching and identifying the fish on cam, as well as interacting on the forum. Over the last several years, Elle has become an expert on the fish that are or could be seen on SharkCam. She is responsible for many of the new species we have "discovered" over the last several years. She now attends the University of New England to study marine biology, with an interest in bony fish and sharks. Valuable contributions to earlier editions of this guide were made by Chris O'Brien when he was an undergraduate marine science major at CCU. Chris completed his honors thesis research on the fish diversity at Frying Pan Tower, and he was author of many profiles in early versions (2015–17) of the guide. Additionally, jon-newbie (an online pseudonym

[1] Watch the live feed from SharkCam at http://explore.org/live-cams/player/shark-cam.
[2] Learn more about Explore.org (https://explore.org/about-us) and the Annenberg Foundation (https://www.annenberg.org/)
[3] Frying Pan Tower is a private facility with a website located at https://fptower.org/.
[4] Google Maps location for Frying Pan Tower (https://goo.gl/maps/3HKBBnDQpuK2)
[5] More information about Coastal Carolina University is available at http://www.coastal.edu/.

for a past contributor to the SharkCam forum) authored many profiles, edited the first three editions of this guide, and contributed many of the early guide images and videos (2015–18). Other contributors to the guide include many additional undergraduates from Coastal Carolina University and SharkCam viewers. Appendix 1 lists specifics on contributions to this guide, as they are known. The authors very much appreciate all of the species discoveries and amazing screenshots submitted by SharkCam viewers.

Sand tiger sharks and round scad in association behavior. Image credit: Explore.org/Erin Burge

In addition to being useful for you, the viewers of SharkCam, this guide is also intended for use by undergraduate marine science students collecting data about the fishes that are found at Frying Pan Tower. In fact, the first peer-reviewed scientific publication that used video collected from SharkCam was completed in April 2021.[6] Nicholas Coleman, a recent graduate of the marine science program at CCU, and Erin, collected and analyzed data for over two years on the association behavior evident between sand tiger sharks, round scad, a common small fish, and mesopredators, a diverse group of medium-sized piscivores. Nick has moved on to the University of Maryland, Chesapeake Biological Laboratory, where he is now a graduate student working on sturgeon.

For more details on the funders of this project, the many people involved with the day-to-day operation and maintenance of SharkCam, and the history of the several SharkCams over the last seven years, see Appendix 2.

This guide is organized into three main sections. The Identification Images section contains pictures the reader can use to identify likely matches for a fish sighted on the streaming video. Each picture is an image taken from SharkCam[7] or archive footage,[8] unless otherwise credited, and is accompanied by the common and scientific names of the fish. The **scientific names in dark red** are hyperlinked to videos posted to YouTube for each species. We've also included images of some interesting non-fish passersby, like two species of sea turtles and even a diving bird! The Identification Images section is arranged into categories, or types, of fishes that are similar to each other in some important identification characteristics. The characteristics used are based heavily on the "Identification Groups" used in the book *Reef Fish Identification Florida Caribbean Bahamas*, by Paul Humann and Ned DeLoach.[9] Humann & DeLoach is one of the best commercial guides available for divers and fish watchers. Other guides that are particularly useful for identifying fishes seen on SharkCam include the illustrated book *A Field Guide to Coastal Fishes From Maine to Texas* by Val Kells and Kent Carpenter,[10] and online resources such as the photographic guide *Florent's Guide to the Tropical Reefs*, curated by Florent Charpin,[11] and a scientifically-focused technical guide from the Smithsonian Tropical Research Institute with numerous photographs and a smartphone app, Robertson and Van Tassell's *Shorefishes of the Greater Caribbean*.[12]

Readers of *SharkCam Fishes* that are familiar with the technical details of groups of fishes will note that the evolutionary relationships between species and families get a little jumbled using this type of categorization approach. For example, the category "Swims with Pectoral Fins/Obvious Scales" includes many small-bodied wrasse species (Family Labridae), but does not contain the large bodied hogfish or tautog, both wrasses. The latter examples

[6] Coleman NC, Burge EJ. 2021. Association behavior between sand tiger sharks and round scad is driven by mesopredators. PeerJ 9:e11164 https://doi.org/10.7717/peerj.11164

[7] See Appendix 1 for credits for images provided by SharkCam viewers.

[8] Archive footage is harvested as part of the project that produced this guide. Until fall 2018 archive video was also flagged and posted from screenshots taken with the Snapshot tool directly from the Explore.org interface for SharkCam. Snapshots are accessible from https://explore.org/snapshots/shark-cam/ and a rewind of the current 12 hours of footage is available.

[9] Humann P, DeLoach N, 2014. Reef Fish Identification - Florida Caribbean Bahamas. 4th ed. New World Publications, Inc., Jacksonville, Florida, 548 pp. ISBN-13: 9781878348579

[10] Kells VA, Carpenter K, 2011. A Field Guide to Coastal Fishes from Maine to Texas. Johns Hopkins University Press. 448 pp. ISBN-13: 9780801898389

[11] Available online at http://reefguide.org/home.html.

[12] Robertson DR, Van Tassell J. 2019. Shorefishes of the Greater Caribbean: online information system. Version 2.0. Smithsonian Tropical Research Institute, Balboa, Panamá. https://biogeodb.stri.si.edu/caribbean/en/pages

have been grouped with many of the groupers and sea basses in "Heavy Bodies/Large Lips." We feel that this approach works well for the casual viewer or interested layperson, but less well for a technical specialist. Despite this, we attempt to incorporate the most current taxonomic classifications represented in the peer-reviewed scientific literature and in compendia of taxonomy focused on fishes. These include the Integrated Taxonomic Information System, FishBase, *Shorefishes of the Greater Caribbean* and Eschmeyer's Catalog of Fishes. We welcome input on changes in classification (and associated scientific literature) from specialists who may also be SharkCam viewers and guide users.

We do need to include a little "technicalish" information to help viewers make their identifications. For example, the coloration of many fish seen on SharkCam may not match images seen in publications and on websites. This is because those images are from above the surface of the water, or in shallower water, or in deeper water using artificial lighting, or are an artist's rendering using such images. Water at the depth of SharkCam (50 feet or 15 meters) has filtered out most of the longer wavelengths of visible light, including nearly all of the red and much of the orange, leaving primarily shorter wavelengths in yellow, green, and blue. The camera "sees" the color of fishes based on the color spectrum available to illuminate them. For example, a vermillion snapper got its name from the brilliant red color it shows above or just under the water's surface, but on camera it often appears washed out or pinkish. The current SharkCam video stream is partially color corrected to more closely match natural sunlight illumination. Older images in this guide were created before color correcting was enabled, while more recent images (and newly discovered species) will appear more "true color." This is why some images in this guide are dominated by blues and green, while some orange and red may be obvious in more recent images.

The Species Profiles section contains detailed profiles of **128 fish species** and 14 other animals grouped into the identification categories mentioned previously. Each category grouping also briefly lists the representatives by taxonomic family. Each profile describes characteristics that help the reader distinguish the profiled species from other species seen on SharkCam. For the 9 "typical" species of sharks, four amberjack species, and six slender wrasses special entries[13] detail the more subtle characteristics that can be used with confidence to differentiate species that are often difficult to tell apart. Each species entry contains information about the relative likelihood of seeing a given species during a viewing of SharkCam. These categories, and the values they represent, are based on the review of 1,159 video segments of 20 minutes each completed by undergraduate students. Certain species are likely to be more (or less) frequently seen on seasonal or year-to-year bases.

Relative frequency of occurrence

● ● ● ● ●	**Common = seen often, greater than 50%**
● ● ● ●	**Frequent = seen in 50% to 20% of visits**
● ● ●	**Occasional = seen in 10% to 20% of visits**
● ●	**Uncommon = seen in 1% to 10% of visits**
●	**Rare = seen in less than 1% of**

Relative frequency of occurrence describes the likelihood of sighting a given species during a 20 minute viewing interval. Categories are based on the review of 1,159 video segments of 20 minutes in length. Note that seasonal and daily patterns of behavior may alter these likelihoods. Frequency of sightings on SharkCam does not necessarily reflect the actual abundance of fishes at FPT. Some species are much more (or less) likely to be seen than their actual abundance.

Relative size

○ ○ ○ ○ ○	**Very large (>1 m or >39 in)**
○ ○ ○ ○ ◌	**Large to Very large**
○ ○ ○ ○	**Large (0.5–1 m or 20–39 in)**
○ ○ ○ ◌	**Medium to Large**
○ ○ ○	**Medium (20 cm–0.5 m or 8–20 in)**
○ ○ ◌	**Small to Medium**
○ ○	**Small (10–20 cm or 4–8 in)**
○ ◌	**Very small to Small**
○	**Very small (<10 cm or 4 in)**

Relative size is based on *in situ* observations and reported average sizes. Exceptional individuals may not conform to the expected relative size categories.

Table explaining relative frequency of occurrence and relative size categories as listed in Identification Images and Species Profiles.

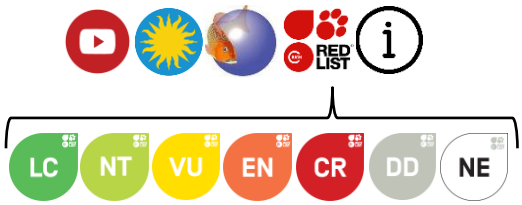
The third section, Appendix 1, contains additional information, including web links to online resources that contain a wealth of images, and scientific and non-scientific information. For almost all species we have SharkCam video clips that illustrate distinguishing characteristics, and we have included links to these on YouTube.[14] We encourage

[13] Positive identification of SharkCam shark species, Positive identification of SharkCam amberjack species, and Positive identification of SharkCam wrasse species

[14] SharkCam video clips of most species are on the Youtube channel at Cape Fear SharkCam Fishes https://www.youtube.com/c/CapeFearSharkCamFishes.

you to investigate these species further using these and other resources you discover. Ideally, you will use this guide as a gateway to greater appreciation of all of the life the oceans harbor.

Guide users will notice that the guide is extensively hyperlinked as indicated by underlined text and icons. Links under each Identification Image can be clicked from the common name to go to the Species Profile to check for a match with your observations from SharkCam, while **scientific names in dark red** and YouTube icons are linked to videos from SharkCam showing the fish of interest. Icons link out to entries in the Smithsonian Tropical Research Institute's information system, Robertson and Van Tassell's *Shorefishes of the Greater Caribbean*, and each entry contains a very useful synthesis of technical information, distribution maps, and identification photographs for fishes. Additionally, icons are included for FishBase, a thorough online database of fish species information, and the International Union for Conservation of Nature's Red List of Threatened Species (IUCN Red List) as appropriate within Species Profiles. Each profile also contains an information icon link that will take you to the Additional Information appendix. From there, hyperlinks out to the web will help you confirm that you have correctly identified your "mystery" fish. If you find that a profile and its images aren't confirming your identification, there are links to the major sections of the guide available at the bottom of each page. Failure to find a match for your fish might mean that it is a new SharkCam species!



Clickable icon links used in *SharkCam Fishes* include (1st row, left to right), YouTube, STRI *Shorefishes of the Greater Caribbean*, FishBase, IUCN Red List, and the internal Additional Information appendix. IUCN Red List icons (2nd row, left to right) represent Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered, Data Deficient, and Not Evaluated, respectively.

A new species means that you can help us improve this guide! In addition to letting us know via the SharkCam forum about new species, you can always contact us by e-mail to Erin Burge. Additionally, you will see we do not have crisp, clean images for many of the fishes identified so far. If you get a nice snapshot or video of a fish that would help others and improve the guide, please share it with us.

SharkCam is a real-time glimpse into a world that is largely foreign to most of us. Remember that the oceans are an incredibly dynamic, ever-changing environment. For example, frequent viewers will periodically see the water turn green or brown on SharkCam, reducing water clarity and limiting the number of fish seen. Green water is due to natural increases in the amount of microscopic algae, or phytoplankton, in the water. While the turbidity might be a minor irritation to viewers because of the diminished visibility, the algae feeds zooplankton and small fish, and they feed larger fish, and so on all the way up to the sharks. Be patient; an algal bloom will typically clear within a few days, visibility will return, and the fish will have greatly benefited from the additional food. Brown water is primarily due to sediments stirred up from the sea bottom, as after large storms and high waves, and will also clear up shortly.

Because of the water's effect on SharkCam fish colors, periodic turbidity, and the fact that many fish can change colors and patterns almost at will, our guide relies heavily on fish shape and color tone (e.g., light, dark) rather than true color. It also doesn't use fish size much. Everyone knows how big a mailbox or car is, so here on the surface it has meaning to say a thing is bigger or smaller than a mailbox or car. Underwater, there are no such familiar frames of reference. In addition, the camera is only one "eye," so depth perception is difficult. Saying a fish gets to be 6 or 36 inches long doesn't help much. Is it a big fish far away or a little fish close up? On SharkCam, they can appear to be the same size. To help with this, we have included relative size estimations for each species. These are based on *in situ* observations and personal experience of the authors. Some individual fish will not conform to these categorizations, but generally speaking, you, the viewers of SharkCam, should begin to incorporate the relative sizes of fish into your identifications.

So, sit back, watch SharkCam, use the guide, and enjoy. You are guaranteed to see something interesting, and maybe you will be the first to catch a glimpse of a new species that we can add to this guide!

IDENTIFICATION IMAGES

Sharks and Rays

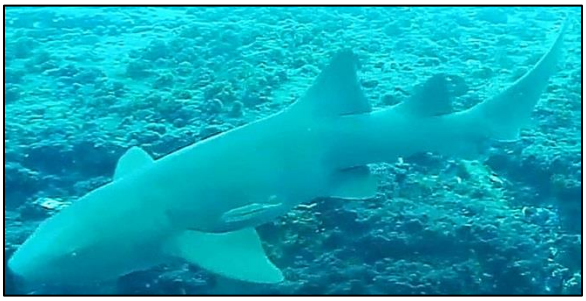
Atlantic Sharpnose Shark ●
Rhizoprionodon terraenovae ○○○○

Bull Shark ● *Carcharhinus leucas* ○○○○○

Great Hammerhead ●
Sphyrna mokarran ○○○○○

Great White Shark ●
Carcharodon carcharias ○○○○○

Lemon Shark ●
Negaprion brevirostris ○○○○○



Nurse Shark ● ●
Ginglymostoma cirratum ○○○○○

Sand Tiger Shark ● ● ● ●
Carcharias taurus ○○○○○

Sandbar Shark ● ● ●
Carcharhinus plumbeus ○○○○

Spinner Shark ●
Carcharhinus brevipinna ○○○○

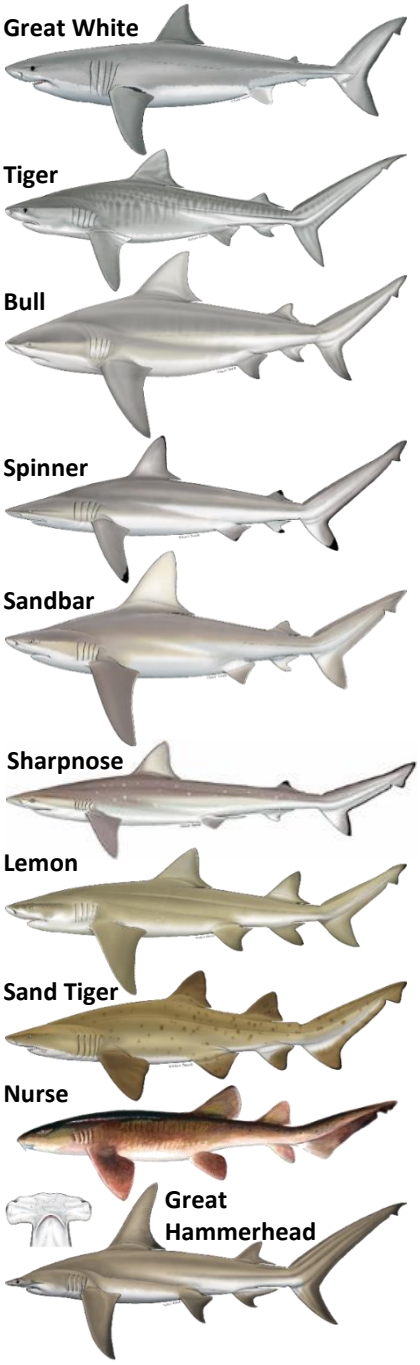
SharkCam Fishes

Tiger Shark ●
Galeocerdo cuvier ○○○○○

Giant Manta ● *Mobula birostris* ○○○○○

Spotted Eagle Ray ●
Aetobatus narinari ○○○○○

Southern Stingray ● ● ●
Hypanus americanus ○○○○◌



Illustrations by Marc Dando from *Shark Biology and Conservation, DC Abel and RD Grubbs. 2020. John Hopkins University Press.*
https://jhupbooks.press.jhu.edu/title/shark-biology-and-conservation

SharkCam Fishes

Silvery Fishes

African Pompano ● ● *Alectis ciliaris* ○ ○ ○ ○

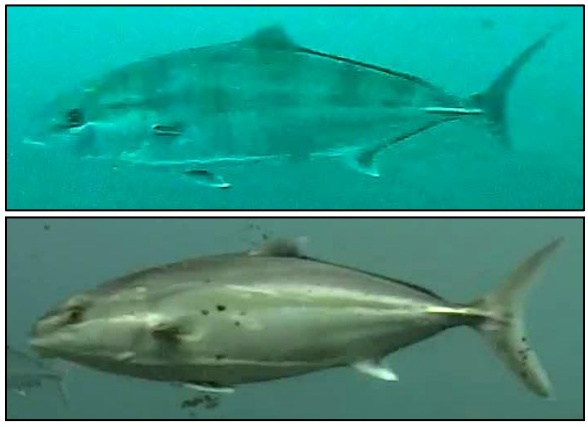
Crevalle Jack ● ● ● *Caranx hippos* ○ ○ ○ ○ ○

Permit ● ● ● *Trachinotus falcatus* ○ ○ ○ ○

Palometa ● *Trachinotus goodei* ○ ○ ○

Greater Amberjack ● ● ● ● ●
Seriola dumerili ○ ○ ○ ○ ○

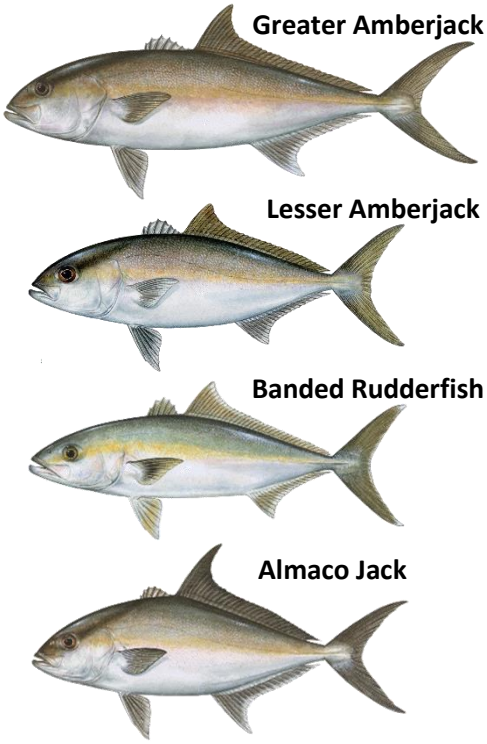
Lesser Amberjack ● *Seriola fasciata* ○ ○ ○ ○



Banded Rudderfish ● *Seriola zonata* ○ ○ ○ ○

Almaco Jack ● ● ● ● *Seriola rivoliana* ○ ○ ○ ○

SharkCam Fishes



Illustrations of SharkCam amberjacks
© Diane Rome Peebles

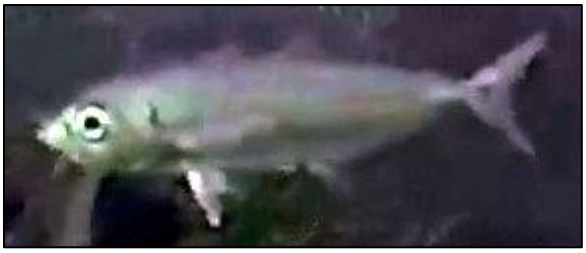
Horse-eye Jack ● ***Caranx latus*** ○ ○ ○ ○

Blue Runner ● ● ● ● ***Caranx crysos*** ○ ○ ○

Rainbow Runner ● ●
Elagatis bipinnulata ○ ○ ○ ◌

Yellow Jack ● ●
Carangoides bartholomaei ○ ○ ○

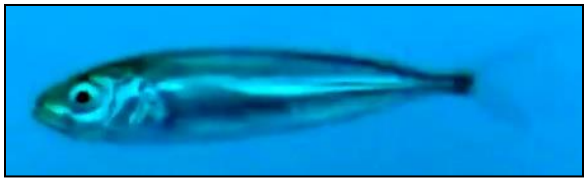
Bar Jack ● ● ● ● ***Carangoides ruber*** ○ ○ ◌



Bigeye Scad ● ●
Selar crumenophthalmus ○ ◌

Round Scad ● ● ● ● ●
Decapterus punctatus ○ ○

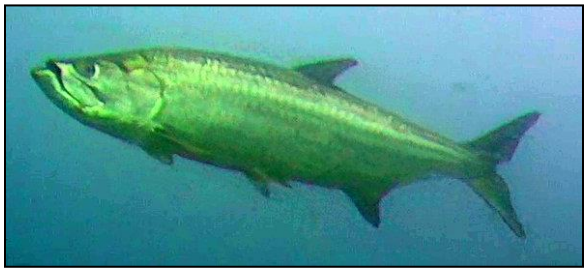
SharkCam Fishes



Scaled Herring ● *Harengula jaguana* ○ ○

Northern Sennet ● *Sphyraena borealis* ○ ○

Bluefish ● ● *Pomatomus saltatrix* ○ ○ ○



Tarpon ● *Megalops atlanticus* ○ ○ ○ ○ ○

Great Barracuda ● ● ● ● ●
Sphyraena barracuda ○ ○ ○ ○ ○

King Mackerel ●
Scomberomorus cavalla ○ ○ ○ ○ ○

Atlantic Bonito ● ● *Sarda sarda* ○ ○ ○

Little Tunny ● ●
Euthynnus alletteratus ○ ○ ○ ○

Atlantic Spadefish ● ● ● ●
Chaetodipterus faber ○ ○ ○

SharkCam Fishes

Bermuda Chub ● ● ● ● ●
Kyphosus sectatrix ○ ○ ○

Colorful Ovals

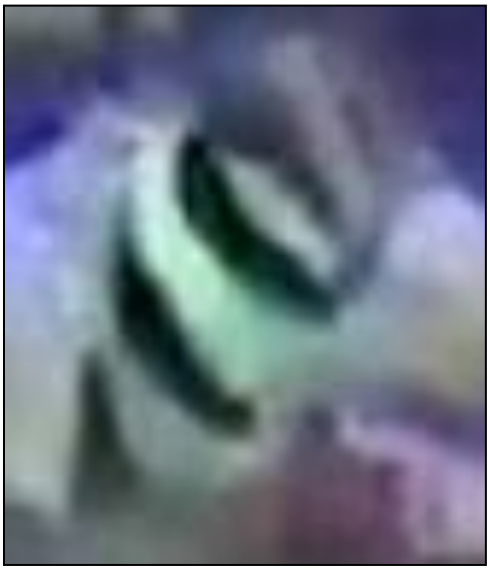
Blue Angelfish ● ● ● ● ●
Holacanthus bermudensis ○ ○ ○

Queen Angelfish ● ● ● ● ●
Holacanthus ciliaris ○ ○ ○

Rock Beauty ● ***Holacanthus tricolor*** ○ ○

French Angelfish ● ***Pomacanthus paru*** ○ ○ ○

Gray Angelfish ● ***Pomacanthus arcuatus*** ○ ○ ○



Banded Butterflyfish ● ***Chaetodon striatus*** ○ ○

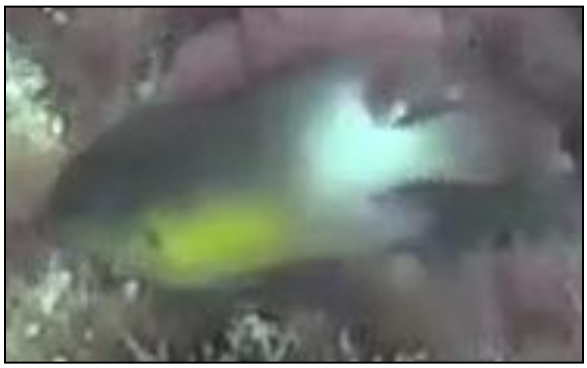
SharkCam Fishes

Reef Butterflyfish ● *Chaetodon sedentarius* ○ ○

Cocoa Damselfish ● ● ● ● ●
Stegastes xanthurus ○

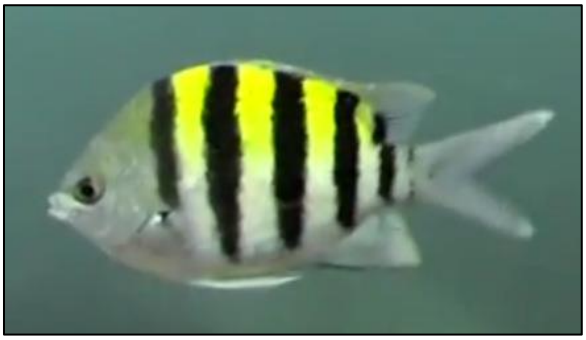
Spotfin Butterflyfish ● *Chaetodon ocellatus* ○ ○

Purple Reeffish ● ● ● ● *Chromis scotti* ○



Bicolor Damselfish ● ● ● *Stegastes partitus* ○

Blue Chromis ● ● *Chromis cyanea* ○



Sergeant Major ● ● ● ● *Abudefduf saxatilis* ○

SharkCam Fishes

Blue Tang (juvenile ● ● ● ●, adult ●)
Acanthurus coeruleus (juvenile ○ ◌, adult ○ ○)

Doctorfish ● ● ***Acanthurus chirurgus*** ○ ○

Ocean Surgeon ● ***Acanthurus tractus*** ○ ○

Surgeonfishes ● ● ●***Acanthurus* spp.** ○ ○

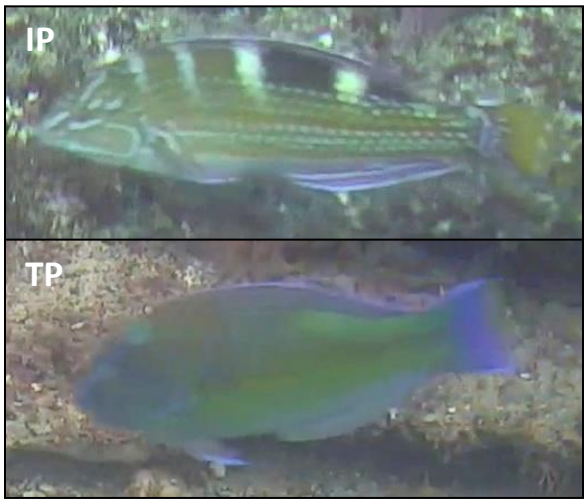
Swim with Pectoral Fins/Obvious Scales

Spanish Hogfish ● ● ● ● ● ***Bodianus rufus*** ○ ○ ◌

SharkCam Fishes

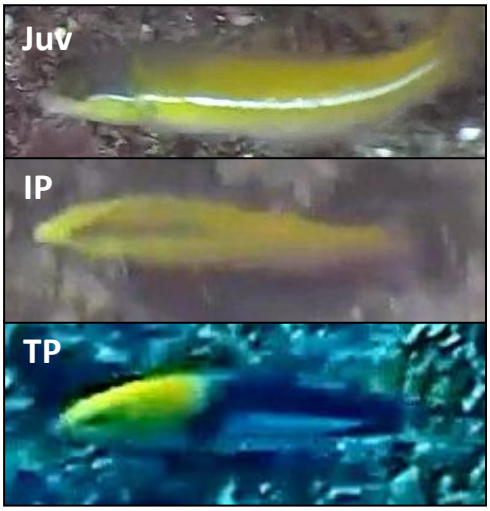
Spotfin Hogfish ● ● ***Bodianus pulchellus*** ○ ○ ◌

Creole Wrasse ● ● ***Clepticus parrae*** ○ ○ ◌

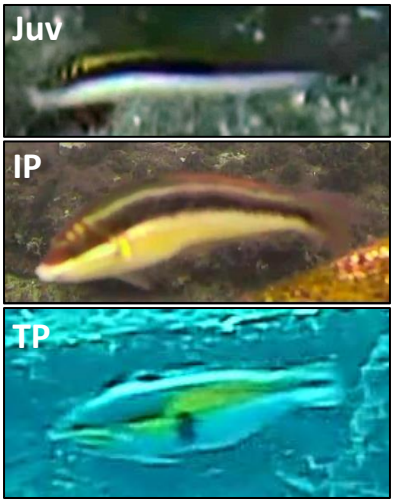


Puddingwife ● ● ***Halichoeres radiatus*** ○ ○

Painted Wrasse ● ***Halichoeres caudalis*** ○



Yellowhead Wrasse ● ●
Halichoeres garnoti ○ ○



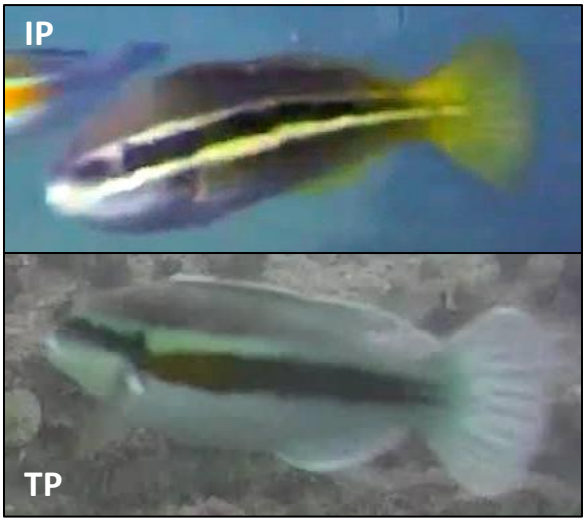
Clown Wrasse ● ● ●
Halichoeres maculipinna ○ ○

Slippery Dick ● ● ● ●
Halichoeres bivittatus ○ ○

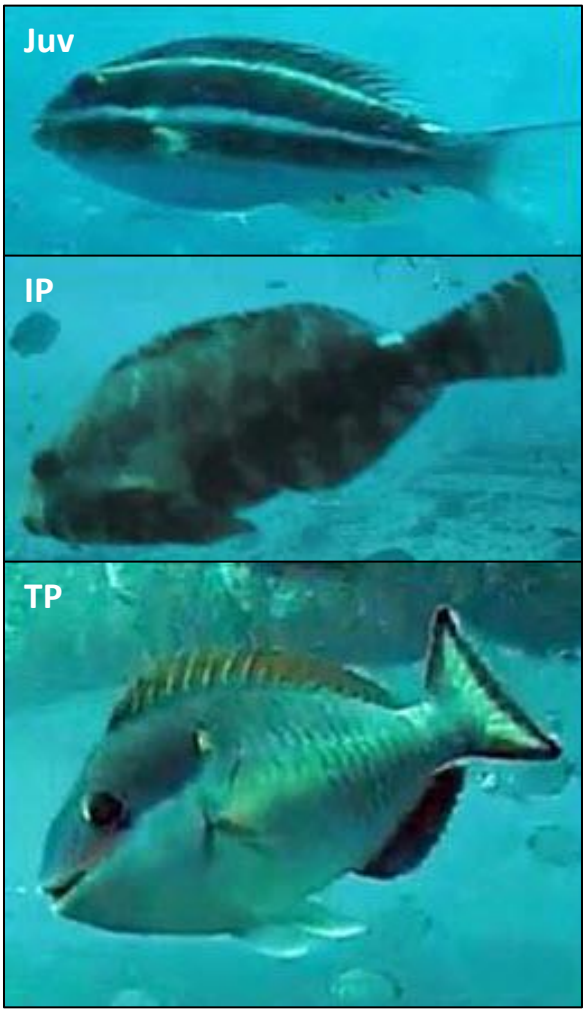
SharkCam Fishes

Bluehead ● ● ● ● ●
Thalassoma bifasciatum ○

Princess Parrotfish ● ***Scarus taeniopterus*** ○ ○ ◌



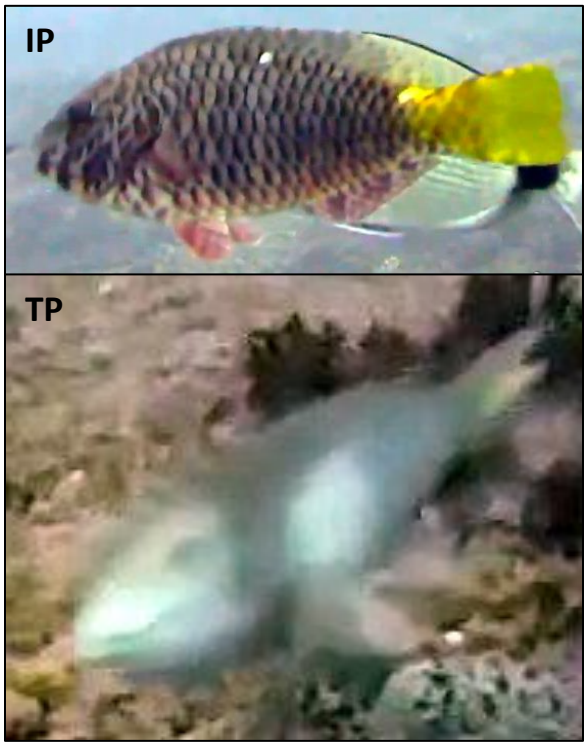
Striped Parrotfish ● ***Scarus iseri*** ○ ○ ◌



Redband Parrotfish ● ●
Sparisoma aurofrenatum ○ ○ ○

SharkCam Fishes

Stoplight Parrotfish ● ● *Sparisoma viride* ○ ○ ○



Yellowtail Parrotfish ● ●
Sparisoma rubripinne ○ ○ ◌

Heavy Bodies/Large Lips

Gag ● ● ● ● *Mycteroperca microlepis* ○ ○ ○ ○

Black Grouper ● *Mycteroperca bonaci* ○ ○ ○ ◌

Goliath Grouper ●
Epinephelus itajara ○ ○ ○ ○ ○

Graysby ● *Cephalopholis cruentata* ○ ○ ○

Scamp ● ● ● *Mycteroperca phenax* ○ ○ ○ ◌
(top, dark phase; bottom, cat's paw phase)

SharkCam Fishes

Black Sea Bass ● ● ● ●
Centropristis striata ○ ○ ○

Whitespotted Soapfish ● ●
Rypticus maculatus ○ ○ ◌

Greater Soapfish ● ***Rypticus saponaceus*** ○ ○ ○

Tautog ● ● ***Tautoga onitis*** ○ ○ ○ ◌

Cobia ● ● ***Rachycentron canadum*** ○ ○ ○ ○ ◌

Hogfish ● ● ***Lachnolaimus maximus*** ○ ○ ○ ◌

Sloping Heads and Tapered Bodies

Cubera Snapper ● ●
Lutjanus cyanopterus ○ ○ ○ ○

Gray Snapper ● ● ● ***Lutjanus griseus*** ○ ○ ○

Yellowtail Snapper ● ● ●
Ocyurus chrysurus ○ ○ ○

Vermilion Snapper ● ● ● ●
Rhomboplites aurorubens ○ ○ ○

Knobbed Porgy ● ● ***Calamus nodosus*** ○ ○ ○

Red Porgy ● ***Pagrus pagrus*** ○ ○ ○

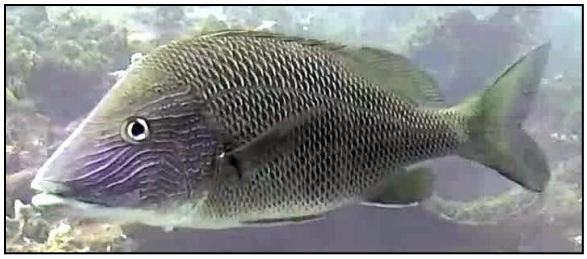
Saucereye Porgy ● ●
Calamus calamus ○ ○ ○

SharkCam Fishes

Scup ● ***Stenotomus chrysops*** ○ ○

Sheepshead ● ● ● ●
Archosargus probatocephalus ○ ○ ○

Spottail Pinfish ● ● ● ● ●
Diplodus holbrookii ○ ○



White Grunt ● ● ● ● ***Haemulon plumierii*** ○ ○ ○

White Margate ● ***Haemulon album*** ○ ○ ○

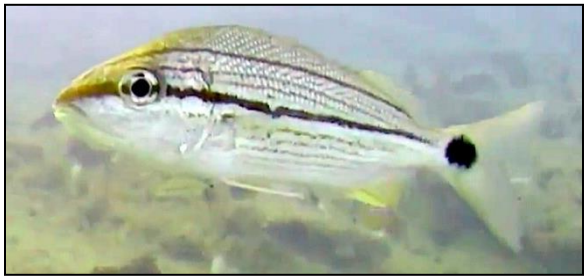
Black Margate ●
Anisotremus surinamensis ○ ○ ○

Porkfish ● ***Anisotremus virginicus*** ○ ○ ◌

Striped Grunt ● ● ***Haemulon striatum*** ○ ○

SharkCam Fishes

Boga ● ***Haemulon vittatum*** ○ ○



Tomtate ● ● ● ● ● ***Haemulon aurolineatum*** ○ ○

Spot ● ***Leiostomus xanthurus*** ○ ○ ◌

Red Drum ● ***Sciaenops ocellatus*** ○ ○ ○ ○

Oddly-shaped Swimmers

Gray Triggerfish ● ● ***Balistes capriscus*** ○ ○ ○

Ocean Triggerfish ●
Canthidermis sufflamen ○ ○ ○

Orangespotted Filefish ● ●
Cantherhines pullus ○ ○

Orange Filefish ● ***Aluterus schoepfii*** ○ ○ ○
(top, male; bottom, female)

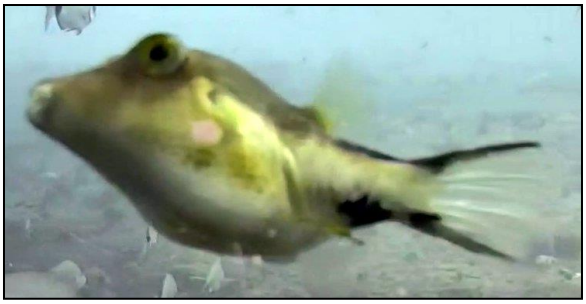
SharkCam Fishes

Planehead Filefish ● ***Stephanolepis hispidus*** ○ ○ ○

Scrawled Filefish ● ● ***Aluterus scriptus*** ○ ○ ○
(top, typical coloration; bottom, blue phase)

Bandtail Puffer ● ***Sphoeroides spengleri*** ○ ◌

Spot-fin Porcupinefish ● ***Diodon hystrix*** ○ ○ ○



Sharpnose Puffer ● ***Canthigaster rostrata*** ○

Scrawled Cowfish ●
Acanthostracion quadricornis ○ ○

Spotted Trunkfish ● ***Lactophrys bicaudalis*** ○ ○

Pilotfish ● ***Naucrates ductor*** ○ ○

SharkCam Fishes

Sharksucker ● ● ***Echeneis naucrates*** ○ ○ ○

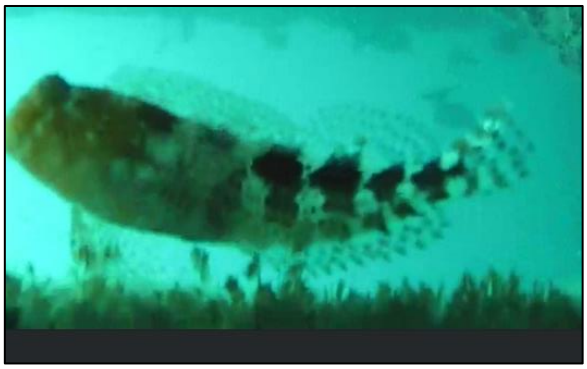
Whitefin Sharksucker ● ●
Echeneis neucratoides ○ ○ ◌

Trumpetfish ● ***Aulostomus maculatus*** ○ ○ ○

Bottom Fishes

Belted Sandfish ● ● ***Serranus subligarius*** ○

Harlequin Bass ● ● ***Serranus tigrinus*** ○ ○



Saddled Blenny ● ●
Malacoctenus triangulatus ○

Seaweed Blenny ● ●
Parablennius marmoreus ○

Cubbyu ● ● ***Pareques umbrosus*** ○ ○ ◌

SharkCam Fishes

Squirrelfish ● ● ***Holocentrus adscensionis*** ○ ○ ○

Red Lionfish ● ***Pterois volitans*** ○ ○ ◌
(non-native species)

Spotted Scorpionfish ●
Scorpaena plumieri ○ ○ ○

Oyster Toadfish ● ***Opsanus tau*** ○ ○ ○

Spotted Goatfish ●
Pseudupeneus maculatus ○ ○ ◌

Yellow Goatfish ●
Mulloidichthys martinicus ○ ○ ◌

Southern Flounder ●
Paralichthys lethostigma ○ ○ ○

SharkCam Fishes

Purplemouth Moray ●
Gymnothorax vicinus ○○○○○

Spotted Moray ●
Gymnothorax moringa ○○○○

Sharptail Eel ● ***Myrichthys breviceps*** ○○○○

Not Fishes

Human Freediver ●
Homo sapiens aquaticus ○○○○○

Human Scuba Diver ●
Homo sapiens scubica ○○○○○

Common Loon ● ***Gavia immer*** ○○○

Loggerhead Sea Turtle ●
Caretta caretta ○○○○○

Green Sea Turtle ● ***Chelonia mydas*** ○○○○○

SharkCam Fishes

West Indian Sea Egg ● ●
Tripneustes ventricosus ○

Jonah Crab ● ***Cancer borealis*** ○ ○

Blotched Swimming Crab ●
Achelous spinimanus ○

Caribbean Spiny Lobster ●
Panulirus argus ○ ○ ○ ◌

Inshore Squids (Longfin Inshore SquidE and Slender Inshore Squid) ●
Doryteuthis pealeii and ***D. pleii*** ○ ○ ◌

Atlantic Longarm Octopus ●
Macrotritopus defilippi ○ ◌

Common Octopus ● ***Octopus vulgaris*** ○ ○ ○

SharkCam Fishes

Warty Comb Jelly ● ***Mnemiopsis leidyi*** ○

Sea Wasp ● ***Alatina alata*** ○ ○

Moon Jelly ● ***Aurelia aurita*** ○ ○ ○

SPECIES PROFILES (# SPECIES IN GROUP); TOTAL NUMBER OF FISH SPECIES = 128

SHARKS AND RAYS (13)

1. NEW Atlantic Sharpnose Shark
2. Bull Shark
3. Giant Manta
4. Great Hammerhead
5. Great White Shark
6. Lemon Shark
7. Nurse Shark
8. Sand Tiger Shark
9. Sandbar Shark
10. Southern Stingray
11. NEW Spinner Shark
12. Spotted Eagle Ray
13. Tiger Shark

POSITIVE IDENTIFICATION OF SHARKCAM SHARK SPECIES

SILVERY FISHES (25)

14. African Pompano
15. Almaco Jack
16. Atlantic Bonito
17. Atlantic Spadefish
18. Banded Rudderfish
19. Bar Jack
20. Bermuda Chub
21. Bigeye Scad
22. Blue Runner
23. Bluefish
24. Crevalle Jack
25. Great Barracuda
26. Greater Amberjack
27. Horse-eye Jack
28. King Mackerel
29. NEW Lesser Amberjack
30. Little Tunny
31. Northern Sennet
32. NEW Palometa
33. Permit
34. Rainbow Runner
35. Round Scad
36. Scaled Herring
37. Tarpon
38. Yellow Jack

POSITIVE IDENTIFICATION OF SHARKCAM AMBERJACK SPECIES

COLORFUL OVALS (16)

39. Banded Butterflyfish
40. Bicolor Damselfish
41. Blue Angelfish
42. Blue Chromis
43. Blue Tang
44. Cocoa Damselfish
45. Doctorfish
46. French Angelfish
47. NEW Gray Angelfish
48. Ocean Surgeon
49. Purple Reeffish
50. Queen Angelfish
51. NEW Reef Butterflyfish
52. Rock Beauty
53. Sergeant Major
54. Spotfin Butterflyfish

Surgeonfishes (Blue Tang, Doctorfish, Ocean Surgeon)

SWIM WITH PECTORAL FINS/OBVIOUS SCALES (14)

55. Bluehead
56. Creole Wrasse
57. Clown Wrasse
58. NEW Painted Wrasse
59. Princess Parrotfish
60. Puddingwife
61. Redband Parrotfish
62. Slippery Dick
63. Spanish Hogfish
64. Spotfin Hogfish
65. Stoplight Parrotfish
66. Striped Parrotfish
67. Yellowhead Wrasse
68. Yellowtail Parrotfish

POSITIVE IDENTIFICATION OF SHARKCAM WRASSE SPECIES

HEAVY BODIES/LARGE LIPS (11)

69. Black Grouper
70. Black Sea Bass
71. Cobia
72. Gag
73. Goliath Grouper
74. Graysby
75. Greater Soapfish
76. Hogfish
77. Scamp
78. Tautog
79. Whitespotted Soapfish

SLOPING HEADS AND TAPERED BODIES (19)

80. NEW Boga
81. Black Margate
82. Cubera Snapper
83. Gray Snapper
84. Knobbed Porgy
85. Porkfish
86. Red Drum
87. Red Porgy
88. Saucereye Porgy
89. Scup
90. Sheepshead
91. NEW Spot
92. Spottail Pinfish
93. Striped Grunt
94. Tomtate
95. Vermilion Snapper
96. White Grunt
97. NEW White Margate
98. Yellowtail Snapper

ODDLY-SHAPED SWIMMERS (15)

99. Bandtail Puffer
100. Gray Triggerfish
101. NEW Ocean Triggerfish
102. Orange Filefish
103. Orangespotted Filefish
104. Pilotfish
105. Planehead Filefish
106. Scrawled Cowfish
107. Scrawled Filefish
108. Sharksucker
109. Sharpnose Puffer
110. Spot-fin Porcupinefish
111. Spotted Trunkfish
112. Trumpetfish
113. Whitefin Sharksucker

BOTTOM FISHES (15)

114. Belted Sandfish
115. Cubbyu
116. Harlequin Bass
117. NEW Oyster Toadfish
118. Purplemouth Moray
119. Red Lionfish
120. Saddled Blenny
121. Seaweed Blenny
122. Sharptail Eel
123. Southern Flounder
124. Spotted Goatfish
125. Spotted Moray
126. Spotted Scorpionfish
127. Squirrelfish
128. Yellow Goatfish

NOT FISHES (14)

NEW Atlantic Longarm Octopus
Blotched Swimming Crab
Caribbean Spiny Lobster
Common Loon
Common Octopus
Green Sea Turtle
Human (Freediver and Scuba Diver)
NEW Jonah Crab
Loggerhead Sea Turtle
NEW Inshore Squids (Longfin and Slender Inshore Squids)
Moon Jelly
NEW Sea Wasp
Warty Comb Jelly
West Indian Sea Egg

SHARKS AND RAYS (13)

Positive identification of SharkCam sharks

Requiem Sharks–Carcharhinidae
- Atlantic Sharpnose Shark
- Bull Shark
- Lemon Shark
- Sandbar Shark
- Spinner Shark
- Tiger Shark

Whiptail Stingrays–Dasyatidae
- Southern Stingray

Nurse Sharks–Ginglymostomatidae
- Nurse Shark

Mackerel and White Sharks–Lamnidae
- Great White Shark

Eagle Rays–Myliobatidae
- Spotted Eagle Ray

Manta Rays and Devilfishes–Mobulidae
- Giant Manta

Ragged-tooth Sharks–Odontaspididae
- Sand Tiger Shark

Hammerhead Sharks–Sphyrnidae
- Great Hammerhead

Apparently yawns are contagious among sharks. Here, two sand tiger sharks *Carcharias taurus* cruise by SharkCam in need of a nap. Image credit: Explore.org/CamOp Scout

Sharks, like this sandbar *Carcharhinus plumbeus*, are often accompanied by smaller fish. This behavior may be a way to be close at hand to grab tidbits from a shark's meal, to discourage in-between-sized predators from attacking, and/or make it easier for them to travel to other locations (like drafting behind another vehicle). In this image, a sandbar shark is shadowed by a school of round scad *Decapterus punctatus*, a few blue runners *Caranx crysos* , and a yellow jack *Carangoides bartholomaei*. Image credit: Explore.org/Erin Burge

Atlantic Sharpnose Shark

***Rhizoprionodon terraenovae* (Richardson, 1836)**
Carcharhinidae (Class Chondrichthyes)

Distinguishing characteristics:
The Atlantic sharpnose shark is thin and streamlined with a pointed snout. In terms of adult size, it is perhaps the smallest shark seen on SharkCam to date. The first dorsal fin is generally triangular and no taller than the body is deep. The second dorsal fin is short despite its wide base and is positioned noticeably closer to the tail than the anal fin. A few white spots may be visible scattered along the sharpnose shark's flank.

NOTE: A sharpnose shark was seen with nighttime lighting on 25 August 2021 at 8:58PM EDT. Identification as Atlantic sharpnose shark is tentative, for two reasons. Identification as a sharpnose is based partially on a process of elimination of other carcharhinid species, and another species of sharpnose, the Caribbean sharpnose shark (*R. porosus*), is visually indistinguishable from the Atlantic sharpnose. Both species overlap geographically near SharkCam. See Davis et al. (2018) for additional information.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive Identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Bull Shark

***Carcharhinus leucas* (Müller and Henle, 1839)**
Carcharhinidae (Class Chondrichthyes)





Distinguishing characteristics:
Bull sharks are large, stout sharks with a short, bluntly rounded snout, and relatively small eyes. The first dorsal fin is moderately tall, triangular, and slopes back. Its height is less than the depth of the body and originates over the pectoral fins. The second dorsal fin is approximately half the size of the first. Pectoral fins are long with an angular rear margin. Color on SharkCam has been gray and light brown, with the underside of the snout and chin lighter-cream to white.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Bull sharks have only been seen a few times on SharkCam. A bull shark, likely the same individual, was seen on SharkCam late in the day on 28 August and early in the morning on 29 August 2018. Another was spotted twice with the nighttime light on 1 September 2021, at 9:16 and 9:19PM EDT.

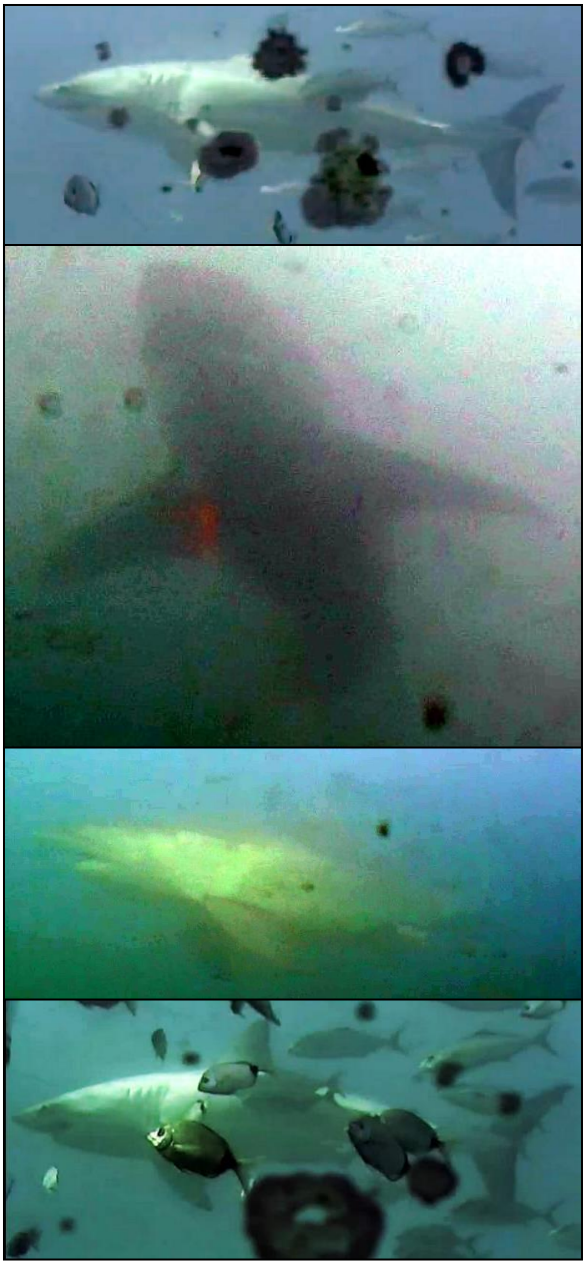
Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Great White Shark

***Carcharodon carcharias* (Linnaeus, 1758)**
Lamnidae (Class Chondrichthyes)



Distinguishing characteristics:
A great white shark is massive and stout with a conical snout. The mouth and eyes are large and dark. The first dorsal fin is tall and triangular. It begins at or just behind the rear of the long pointed pectoral fins. The second dorsal fin is very small. From underneath, the pectoral fins have black tips. The caudal fin is very tall, strongly crescent-shaped (lunate), and has equal-sized top and bottom lobes (homocercal). From the side, the great white is dark above with an abrupt transition to a white belly. A caudal keel, stretching from the tail to the rear of the second dorsal fin, is present. This keel is a thickened ridge of skin on the sides of the body that is visible as the shark swims. Among SharkCam sharks, a caudal keel is only present on white and tiger sharks.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: White sharks have been seen on SharkCam twice. A great white was seen on 9 January 2019 twice, at 12:42PM and 4:34PM EST. The second visit occurred 8 December 2020, and the individual was seen at least eight times.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Lemon Shark

***Negaprion brevirostris* (Poey, 1868)**
Carcharhinidae (Class Chondrichthyes)

Distinguishing characteristics:
Lemon sharks are large, stocky, and yellow to brown sharks with triangular dorsal fins of approximately equal size. The first dorsal fin originates behind the pectoral fins. The pectoral fins are large with a straight to slightly curved rear margin. The snout is blunt and shorter than the width of the mouth, which has been described as having a "gummy" appearance.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Lemon sharks are late summer visitors to Carolinian waters. They are much more common in Florida and the Caribbean where they are often important predators in shallow waters.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Nurse Shark

***Ginglymostoma cirratum* (Bonnaterre, 1788)**
Ginglymostomatidae (Class Chondrichthyes)

Distinguishing characteristics:
Nurse sharks are long, moderately slender sharks with a snakelike, sinuous style of swimming. They have rounded, blunt snouts when viewed from the side or above. Both dorsal fins are located relatively far back on the body towards the tail. The first dorsal fin typically begins at or behind the body mid-line and it is slightly taller than the second dorsal fin. The dorsal fins are moderately sized, about the same size as its pelvic and anal fins. Pelvic fins are located below the first dorsal fin. Coloration tends to be a shade of brown. Close up, two barbels ("whiskers") can be seen hanging from the shark's upper lip.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits

NOTE: Due to the nurse shark's tendency to take up short-term residency in areas before moving on, more frequent sightings over a short period of time could be of a single individual.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Sand Tiger Shark

***Carcharias taurus* Rafinesque, 1810**
Odontaspididae (Class Chondrichthyes)

Distinguishing characteristics:
The sand tiger shark is the only shark seen on SharkCam that often hangs motionless or moves very slowly. It has a thick torso and a long head that tapers to a strongly pointed snout. Its two dorsal fins sit rather far back on its body, towards the tail, and are roughly the same moderate size as its anal and pelvic fins. Its pelvic fins are located below the space between the dorsal fins. On a clear close-up, dark blotches can be seen scattered about on the body and fins.

NOTE: The dark blotches form a pattern that is unique to each individual. The authors are contributing images from SharkCam to the Spot-A-Shark USA program, in partnership with the conservation program of the North Carolina Aquariums.

The sand tiger is the only SharkCam shark that tends to swim with an open mouth and sometimes visible teeth. Many sand tigers seen on SharkCam are large females.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits

NOTE: Sand tiger sharks are migratory, moving north for the warmer months and south for the cooler ones.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Sandbar Shark

***Carcharhinus plumbeus* (Nardo, 1827)**
Carcharhinidae (Class Chondrichthyes)

Distinguishing characteristics:
The sandbar shark looks like what people think of when they think of sharks. It has a thick torso and a long head that tapers to a pointed snout. Its first dorsal fin starts above the midline of its pectoral fins and is tall, generally as tall as its body is deep. Its second dorsal fin sits far to the back by the tail and is small. Sandbar shark body coloration is brownish-gray in good light and individuals will be constantly swimming or gliding on SharkCam.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits

NOTE: Most sandbar sharks seen on SharkCam are female. Some individuals show high site fidelity at Frying Pan Tower and are seen repeatedly, including across multiple years. These sandbars are identifiable because of unique characteristics.

Relative size: O O O O O Very large (>1 m or >39 in)

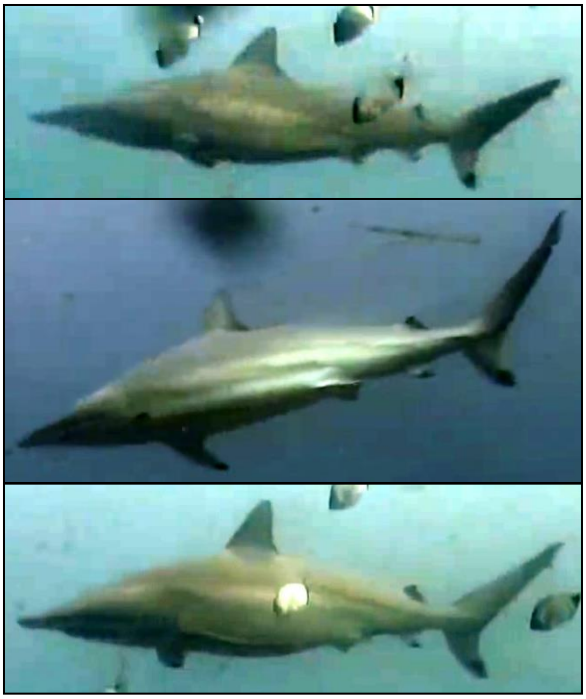
Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Image: Explore.org Barracuda Cam/Pilotfish

Spinner Shark

***Carcharhinus brevipinna* (Müller & Henle, 1839)**
Carcharhinidae (Class Chondrichthyes)



Distinguishing characteristics:
The spinner shark looks like what people think of when they think of sharks. Its body is torpedo-shaped, with a round midsection that distinctly tapers toward the ends. The snout is long, thin, triangular, and sharply pointed. Its first dorsal fin is small, less than half the body depth, and starts behind the pectoral fins, while the second dorsal fin is very small and close to the tail. The tips of the lower tail lobe, pectoral, and anal fins are black. Spinner sharks are constantly swimming or gliding on SharkCam.

NOTE: A spinner shark, likely the same individual, was seen repeatedly on 29 April and 2 May 2021 in the company of several similarly-sized sandbar sharks. Its common name refers to the spinning leaps it makes as part of its feeding activity or when hooked.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Tiger Shark (*Galeocerdo cuvier*)

See Positive Identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

Tiger Shark

***Galeocerdo cuvier* (Péron and Lesueur in Lesueur, 1822) Carcharhinidae (Class Chondrichthyes)**

Distinguishing characteristics:
Tiger sharks are thick-bodied, especially from the snout to mid-body, and the body tapers strongly to a narrow caudal peduncle with a tall caudal fin. The height of the first dorsal fin is approximately half of the body depth and located mid-body. The second dorsal fin is just forward of the caudal peduncle and relatively small. Tiger sharks are named for the presence of dark blotches and "tiger striped" bars that are distinct in younger individuals, and join and fade with increasing size. The best distinguishing characters for the tiger shark are a large head with a noticeably blunt snout and large eyes. They also have a strong longitudinal keel that begins on the caudal peduncle and crosses it onto the tail. This keel is a thickened ridge of skin on the sides of the body that is visible as the shark swims. Among SharkCam sharks, a caudal keel is only present on white and tiger sharks.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Only one tiger shark has been definitively identified from SharkCam, and the angle of viewing does not show the blunt nose and large eyes well. It does, however, show the presence of the longitudinal keel, a feature shared only with the great white shark, among SharkCam sharks. The individual seen in the images was recorded on 27 June 2016 (https://youtu.be/nz_-HZ7CVvs). Frying Pan Tower volunteer UWStig recorded a video (https://youtu.be/Cv9HlFe13hY) on site at Frying Pan Tower the afternoon of 27 June that also is clearly of a tiger shark, likely the same individual.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

The top image was taken from a video by UWStig filmed at Frying Pan Tower on 27 June 2016, the same date as the SharkCam images (bottom three).

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*)

See Positive identification of SharkCam shark species for a discussion of visually distinguishing characteristics and other information.

POSITIVE IDENTIFICATION OF SHARKCAM SHARK SPECIES

Most of the shark species on SharkCam can be difficult to visually identify with confidence since they generally share large size, active movement, a stout body, overall coloring, and a lack of obvious body patterns. The great hammerhead (*Sphyrna mokarran*) is an exception given its hammer-shaped head (cephalofoil) and distinctly tall and falcate (curved like a sickle; hooked) dorsal fin.

The distinguishing characteristics that tend to be most helpful for other SharkCam sharks are the heights and positioning of the dorsal fins and the shapes of the snouts.

Similar species: Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*), Bull Shark (*Carcharhinus leucas*), Great White Shark (*Carcharodon carcharias*), Lemon Shark (*Negaprion brevirostris*), Nurse Shark (*Ginglymostoma cirratum*), Sand Tiger Shark (*Carcharias taurus*), Sandbar Shark (*Carcharhinus plumbeus*), Spinner Shark (*Carcharhinus brevipinna*), Tiger Shark (*Galeocerdo cuvier*)

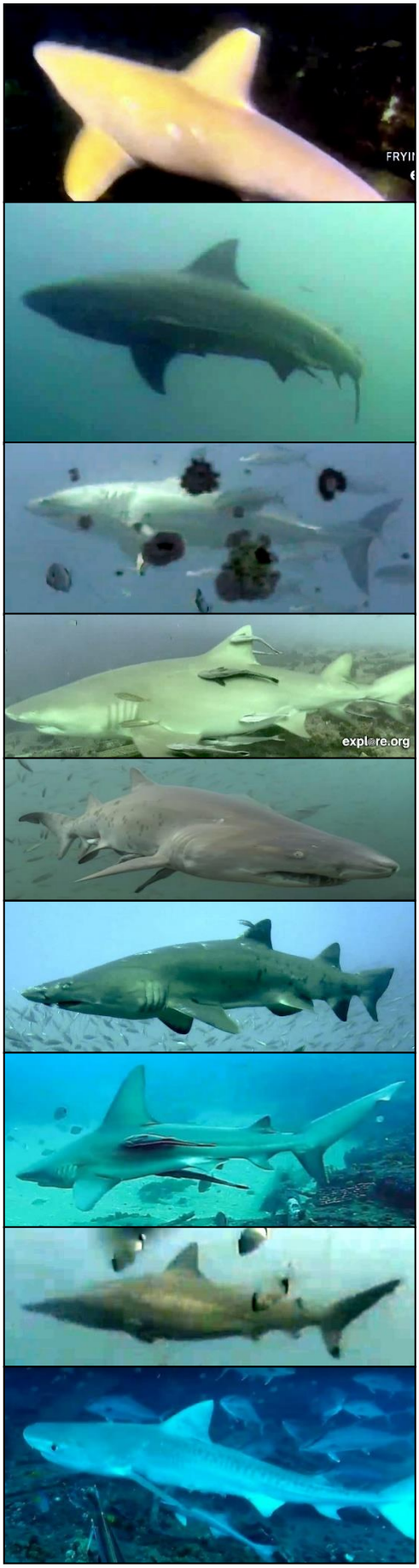
Relative frequency: Frequent → Rare
● ● ● ● Sand Tiger > ● ● ● Sandbar > ● ● Nurse > ● Lemon > ● Bull > ● Great White > ● Tiger > ● Spinner > ● Atlantic Sharpnose

Relative size: Large → Small (of typical individuals)
○ ○ ○ ○ ○ Great White > ○ ○ ○ ○ ○ Tiger > ○ ○ ○ ○ ○ Bull > ○ ○ ○ ○ ○ Lemon > ○ ○ ○ ○ ○ Sand Tiger > ○ ○ ○ ○ ○ Sandbar > ○ ○ ○ ○ ○ Spinner > ○ ○ ○ ○ ○ Nurse > ○ ○ ○ ○ Atlantic Sharpnose

The Atlantic sharpnose shark's first dorsal fin is positioned at about the midpoint of the body, is at most as tall as the body is deep, and approximately triangular. The origin (front most point) of the second dorsal fin is positioned behind the origin of the anal fin, a feature not shared by other SharkCam sharks. Sparse white spots may be visible on its flank. Its body is thin, and a typical sharpnose shark will be smaller than all other sharks on SharkCam.

The bull shark dorsal fins are of clearly unequal size, the medium-sized first dorsal begins at mid-body above the pectoral fins, and the first dorsal fin margin is notably curved; the snout is short and blunt. The body forward of the pectoral fins is stocky.

The great white shark first dorsal fin is tall and triangular. It begins at or just behind the rear of the long pointed pectoral fins. The second dorsal fin is very small. From underneath the pectoral fins have black tips. The caudal fin is very tall, strongly crescent-shaped (lunate), and has equal sized top and bottom lobes (homocercal). From the side the great white is dark above with an abrupt transition to a white belly. The body is massive and stout with a conical snout. A caudal keel, stretching from the tail to the rear of the second dorsal fin is present. Among SharkCam sharks, a caudal keel is only present on white and tiger sharks.



The lemon shark dorsal fins are of roughly equal size and the first dorsal begins at mid-body behind the rear margin of the pectoral fins; the snout is somewhat pointed. The body coloration is dusky yellow.

The nurse shark dorsal fins are positioned well back on the body, past the midpoint, and close together. The two fins are similar in size with the second about ⅔ the height of the first; the snout is rounded. Two barbels or chin whiskers can be seen when a nurse shark faces the camera. No other SharkCam shark has barbels. Its swimming style is very sinuous compared to the other species. The nurse shark will usually be seen closely following the bottom, not swimming well above it like other SharkCam sharks.

The sand tiger shark has similarly-sized first and second dorsal fins, with the first positioned past mid-body; the snout is conical and strongly pointed. The teeth often protrude slightly and are relatively long and curved. No other sharks will typically show teeth on SharkCam.

The sandbar shark first dorsal fin is positioned forward of the mid-body, is noticeably tall, about equivalent to the body depth, and often preceded by the greatest body depth; the snout is pointed. The typical sandbar shark is smaller than the typical bull, tiger, or lemon shark.

The spinner shark first dorsal fin is small, less than half the body depth, and starts behind the pectoral fins. The tips of the lower tail lobe, pectoral, and anal fins are black. The snout is long, thin, triangular, and sharply pointed. Among SharkCam sharks, only the spinner and great white sharks have black-tipped pectorals.

The tiger shark first dorsal fin is similar in size to the bull shark, but the rear margin is straight; the snout is fairly flat and the head is broad on the tiger. Dusky, faded bars on the flanks will be present. On tiger sharks a longitudinal caudal keel that stretches from the tail to forward of the second dorsal fin is present. Among SharkCam sharks, a caudal keel is only present on white and tiger sharks.

(Left) A sand tiger shark *Carcharias taurus* surrounded by round scad *Decapterus punctatus* and (right) four sandbar sharks *Carcharhinus plumbeus*. Image credit: Explore.org/Erin Burge

Six sand tiger sharks *Carcharias taurus* milling under Frying Pan Tower. Image credit: Explore.org/Erin Burge

Great Hammerhead

***Sphyrna mokarran* (Rüppell, 1837)**
Sphyrnidae (Class Chondrichthyes)

Distinguishing characteristics:
Hammerhead sharks are distinguished from other sharks by their distinctive dorsoventrally-flattened and laterally-elongated heads. This head shape is called a cephalofoil, in recognition of its wing-like shape. The great hammerhead head is relatively straight across the front, with a shallow notch in the center. The remainder of the body is stout and classically shark-shaped. The first dorsal fin is very tall and narrow with a distinctive recurved, or falcate, profile. The rear margins of the second dorsal, pelvic and anal fins are also strongly curved, which distinguish the great hammerhead from other hammerheads which may be present in the area.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Great hammerheads have been seen twice on SharkCam, on 31 August 2018 at 7:36PM EDT, and on 16 October 2019 at 10:57AM and 11:00AM EDT.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: No other sharks seen on SharkCam will have the distinctive head and very tall, curved dorsal fin of the great hammerhead.

Giant Manta

***Mobula birostris* (Walbaum, 1792)**
Mobulidae (Class Chondrichthyes)

Distinguishing characteristics:
The giant manta viewed from the side has a large head that transitions into a very wide body, large triangular pectoral wings that arch backwards, and distinct cephalic fins on each side of the head that extend forward. Coloration is typically dark on top and white underneath. Pale patches on the dorsal surface, especially the trailing edge of the pectoral wings, and dark spots underneath are common. Large gill slits are found underneath and forward on the body. Giant manta "fly" through the water propelled by the pectoral wings, similar to a bird in flight. The dorsal fin is set at the extreme back of the body. It is small relative to the size of the animal and is shaped similarly to a shark's. A thin, whip-like tail extends almost one body length.

NOTE: A recent genetic analysis of the rays of family Mobulidae concluded that the genus *Manta* was not a valid taxonomic arrangement, and moved the two nominal members of this genus to *Mobula.* For additional information see White et al. (2018).

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: The giant manta has only been seen on SharkCam once when an individual was spotted twice during the evening of 7 July 2017.

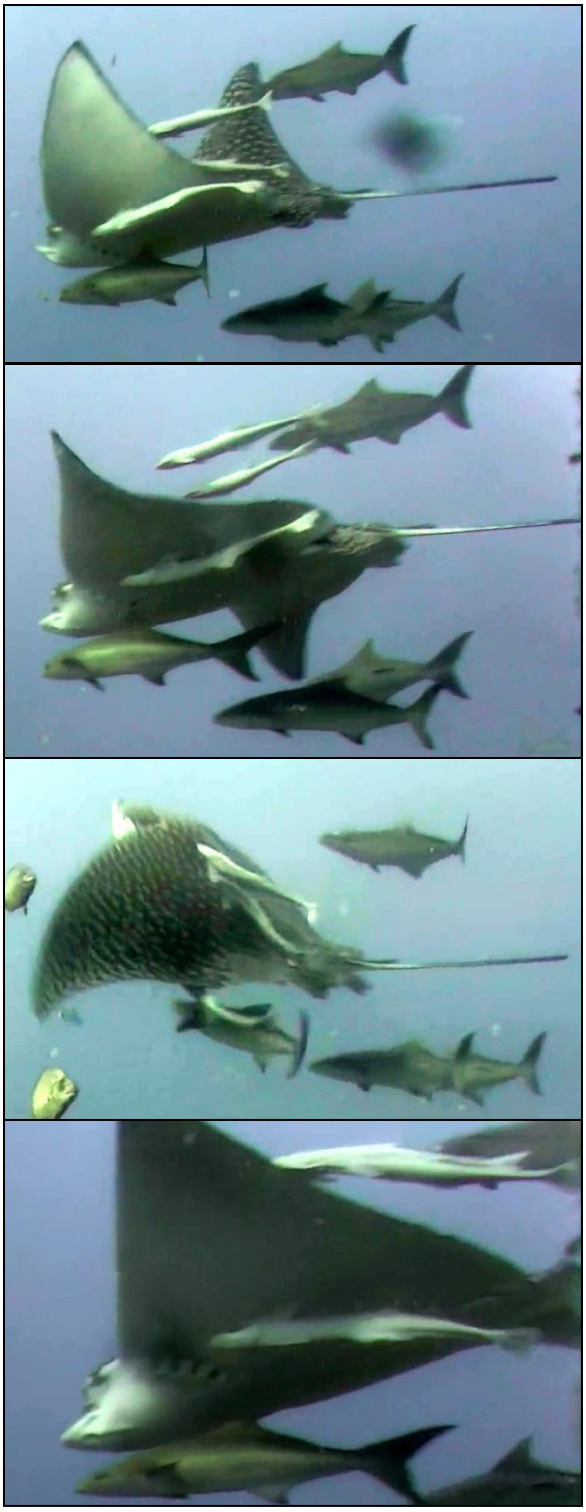
Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in); the average disc width is 4.5 m (15 ft) making this the largest animal seen on SharkCam to date

Similar species: Spotted Eagle Ray (*Aetobatus narinari*)

The spotted eagle ray shares with the giant manta the characteristics of large pelagic rays, including a dark back, light underside, a long, whip-like tail, and "flying" swimming style. During good visibility, the spotted eagle ray is easily distinguished from the giant manta by the presence of a distinctive duck bill-shaped snout, the lack of the manta's cephalic fins, the white circle and spot patterning on the dorsal surface, and the spotted eagle ray's large, but not massive, size.

Spotted Eagle Ray

***Aetobatus narinari* (Euphrasén, 1790)**
Myliobatidae (Class Chondrichthyes)



Distinguishing characteristics:
A spotted eagle ray is shaped like a flattened diamond, and when viewed from the side has a prominent triangular head with a duck bill-shaped snout. The body is dark brown to black on the dorsal surface (above) and white on the ventral surface (below). The dark back will be completely covered with white circles and spots. In clear conditions, a whip-like tail, longer than the body, may be seen.

Spotted eagle rays "fly" through the water propelled by the pectoral fin wings, similar to a bird in flight.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Spotted eagle rays have been seen twice on SharkCam, with the first visit on 27 August 2018 at 10:15AM EDT and again on 12 November 2019 at 11:08AM EST. The first sighting was not clear enough for adequate screen captures (see Sky Pilot's video).

Relative size: O O O O O Very large (>1 m or >39 in)

Similar species: Giant Manta (*Mobula birostris*)

The giant manta shares with the spotted eagle ray the characteristics of large pelagic rays, including a dark back, light underside, a long, whip-like tail, and "flying" swimming style. During good visibility, the manta is easily distinguished from the spotted eagle ray by the presence of distinctive cephalic (head) fins that project forward, the lack of patterning on the dorsal surface, and its massive size.

Southern Stingray

***Hypanus americanus* (Hildebrand and Schroeder, 1928) Dasyatidae (Class Chondrichthyes)**

Distinguishing characteristics:
A southern stingray looks like a horizontal disk "flying" through the water, propelled by rolling two sides (modified pectoral fins) up and down, similar to a bird in flight. The top side (dorsal surface) is dark with a slightly pointed snout, two small protrusions that contain the eyes, no obvious dorsal fins, and a long, whip-like tail. At a distance, intermittent flashes of the white underside are often all that can be seen as a southern stingray "flies" by.

The southern stingray will almost always be closely associated with the bottom.

NOTE: The taxonomic family of the stingrays (Dasyatidae) was recently revised and the genus *Dasyatis* moved to *Hypanus*. See Last et al. (2016) for additional details.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: No other fish seen on SharkCam resembles the southern stingray.

Silvery Fishes (25)

Jacks and Pompanos–Carangidae
- African Pompano
- Almaco Jack
- Banded Rudderfish
- Bar Jack
- Bigeye Scad
- Blue Runner
- Crevalle Jack
- Greater Amberjack
- Horse-eye Jack
- Lesser Amberjack
- Palometa
- Permit
- Rainbow Runner
- Round Scad
- Yellow Jack

Positive identification of SharkCam amberjacks

Herrings, Shads, Sardines, and Menhadens–Clupeidae
- Scaled Herring

Spadefishes–Ephippidae
- Atlantic Spadefish

Sea chubs–Kyphosidae
- Bermuda Chub

Tarpons–Megalopidae
- Tarpon

Bluefishes–Pomatomidae
- Bluefish

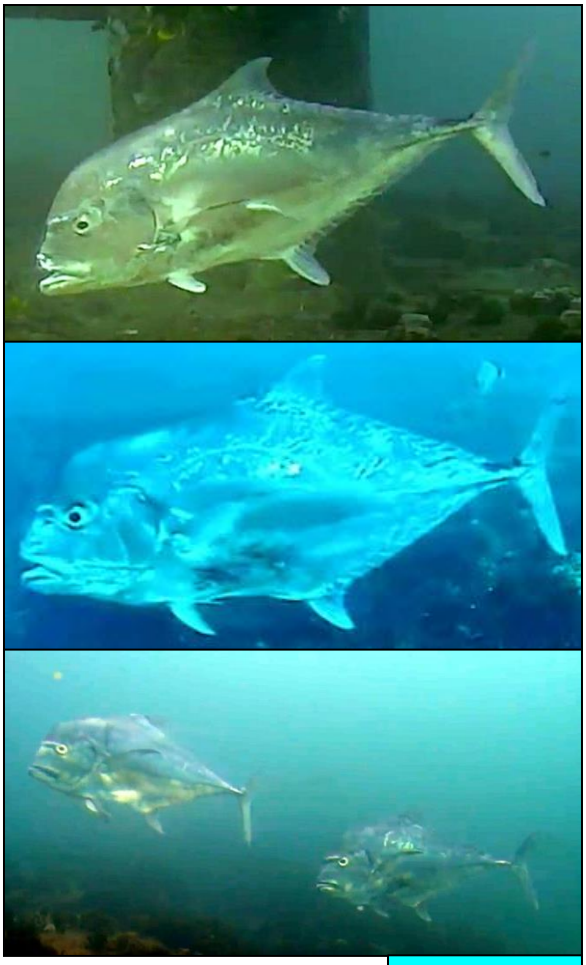
Mackerels, Tunas, and Bonitos–Scombridae
- Atlantic Bonito
- King Mackerel
- Little Tunny

Barracudas–Sphyraenidae
- Great Barracuda
- Northern Sennet

A great barracuda *Spyraena barracuda* flashes a toothy smile for SharkCam viewers. Image credit: Explore.org/CamOp Kathy

African Pompano

***Alectis ciliaris* (Bloch, 1787)**
Carangidae



Distinguishing characteristics:
An African pompano shares several characteristics with other members of the jack family: a deeply forked tail, pointed fins (including both lobes of the tail), and a silvery-gray color. From the side, the body is broad, shaped roughly as an oval. The outline of the face and forehead form a straight line that rises steeply from the mouth to form a distinct bump where it joins the outline of the back. The dorsal and anal fins are triangular and short. Overall, the African pompano has a metallic, mirror-like sheen. From the front, the fish is unusually thin.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Crevalle Jack (*Caranx hippos*), Permit (*Trachinotus falcatus*)

The crevalle jack and the permit share with the African pompano the several characteristics of the jack family.

From the side, the crevalle jack face and forehead outline forms a smooth arc with the back (no bump like the African pompano). The crevalle jack dorsal and anal fins are tall and scythe-shaped (African pompano fins small and triangular) and on SharkCam are usually white (African pompano fins silvery gray). When close enough, crevalle jacks show a small black spot above the pectoral fin (African pompano lacks this).

The permit face and forehead also form a smooth arc with the back (no bump like the African pompano). Permit dorsal and anal fins are tall and thin (African pompano fins small and triangular) and on SharkCam are dark, especially the pectoral fin (African pompano fins silvery gray). The permit has a darker blotch on its side and a white belly patch that, at close viewing, shows a mustard-yellow tint ahead of the anal fin (African pompano shows none of these features).

Crevalle Jack

***Caranx hippos* (Linnaeus, 1766)**
Carangidae

Distinguishing characteristics:
Like other members of the jack family, a crevalle jack has a deeply forked tail, rather pointed fins (including both lobes of tail), and a silvery-gray color. From the side, the body is broad, shaped like an elongated oval with a blunt front. The face and forehead outline form a smooth arc with the back. The dorsal, anal, and pectoral fins are long, scythe shaped, and on SharkCam are usually white. There are two small black spots, one on the base of the pectoral fin and one above the pectoral fin.

Seen face-on, the crevalle jack has unusually forward-facing eyes, relative to most other fish. They are often seen in loosely aggregated groups of a few individuals.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: African Pompano (*Alectis ciliaris*), Permit (*Trachinotus falcatus*), Horse-eye Jack (*Caranx latus*)

Other large bodied jacks, like African pompano, permit, and horse-eye jack have body and fin shapes and colors that are similar to those of the crevalle jack.

The outline of the African pompano head is more angular, with a distinct bump, than the smooth arc of the crevalle jack head. The African pompano is noticeably thin, has shorter dorsal and anal fins, lacks the crevalle jack's dark spots, and has a metallic, mirror-like sheen the crevalle jack lacks.

The permit also has a broad, oval-shaped body but it is rounder, less elongated, than the crevalle jack. The permit has a darker botch on its side and a white belly patch that, at close viewing, shows a mustard-yellow tint ahead of the anal fin, features the crevalle jack lacks. SharkCam permits have dark fins, especially the short pectoral fin, whereas those of the crevalle jack generally are white.

The horse-eye jack lacks the crevalle jack's dark spot and, unlike the crevalle, has large eyes and usually has a bright yellow tail and a narrow, dark stripe that runs from the tail about half way to the mouth.

Permit

***Trachinotus falcatus* (Linnaeus, 1758)**
Carangidae

Distinguishing characteristics:
Like other members of the jack family, the permit has a deeply forked tail, pointed fins (including both lobes of the tail), a slender body cross section, and a silvery-gray color. From the side, most SharkCam permits look relatively round, with an occasional larger individual looking more elongated, or oval-shaped. The eye is dark.

Permits have long, dark dorsal, anal, and caudal fins and a short, dark pectoral fin. There is a dark blotch on the side and a white belly patch that, at close viewing, shows a mustard-yellow tint ahead of the anal fin. The white belly patch shows well under poor lighting conditions and when the fish is swimming rapidly.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Palometa (*Trachinotus goodei)*, African Pompano (*Alectis ciliaris*), Crevalle Jack (*Caranx hippos*), Horse-eye Jack (*Caranx latus*)

A palometa could be easily mistaken for a small permit as the two are closely related. They have similar round to oval body shapes, a deeply forked tail and sharply pointed fins, a slender body cross section, and a silvery-gray color. But, palometa are relatively smaller than any permit seen on SharkCam. The permit will lack the slash-like bars, and greatly elongated dorsal, anal, and tail fin rays of the palometa. The palometa does not have a dark blotch on the side.

From the side, the crevalle jack is shaped like an elongated oval, compared to the permit's typically round shape. The crevalle lacks the darker blotch on the side, the white belly patch, and the short, dark pectoral fin of the permit. The crevalle's fins look white compared to the permit's fins that look dark.

The outline of the African pompano head is more angular, with a distinct bump, than the smooth arc of the permit head. The African pompano has shorter dorsal and anal fins, and has a metallic, mirror-like sheen. It lacks the permit's darker patch on the side, white belly patch, and short, dark pectoral fin. From the side, the horse-eye jack is oval-shaped with large eyes, a narrow, dark stripe that runs from the tail about half way to the mouth, and a tail that is usually bright yellow. The horse-eye jack lacks the permit's darker patch on the side, white belly patch, and short, dark pectoral fin.

Palometa

***Trachinotus goodei* Jordan and Evermann, 1896**
Carangidae

Distinguishing characteristics:
Like other members of the jack family, the palometa has a deeply forked tail, pointed fins (including both lobes of the tail), a slender body cross section, and a silvery-gray color. From the side, palometa are round to oval-shaped. The eye is notably reflective.

Their most prominent features are the long, dark extensions of the symmetrical dorsal and anal fin rays and the long lobes of the dark-edged tail. Five narrow, slash-like bars, three obvious and two subtle, are spaced evenly on the side of the body.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: A palometa has only been seen once on SharkCam. An individual lingered with a school of Atlantic spadefish for over an hour during mid-day on 14 November 2021.

Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Permit (*Trachinotus falcatus*), Atlantic Spadefish (*Chaetodipterus faber*)

A small permit could be easily mistaken for a palometa as the two are closely related. They have similarly round to oval body shapes, a deeply forked tail and sharply pointed fins, a slender body cross section, and a silvery-gray color. However, the permits seen on SharkCam have always been much larger than a palometa, and the permit will lack the slash-like bars, and greatly elongated dorsal, anal, and tail fin rays of the palometa.

Atlantic spadefish have a similar triangular silhouette due to their diverging dorsal and anal fins and the presence of dark bars on the sides. The tail of Atlantic spadefish is not forked, nor does the spadefish have greatly elongated dorsal and anal fins. The bars of Atlantic spadefish are broad and of variable color tone (gray to black, or nonexistent), while those of the palometa are slash-like and dark.

Almaco Jack

***Seriola rivoliana* Valenciennes in Cuvier and Valenciennes, 1833 Carangidae**

Distinguishing characteristics:
An almaco jack shares several characteristics with other members of the jack family: a deeply forked tail, rather pointed fins (including both lobes of tail), and a slender body cross section. From the side, the body is oval shaped with a tall dorsal fin shaped like a scythe blade. The almaco's body is about three times as long as it is tall. The body color ranges from silvery gray to a dark olive but the fins are dark colored. A distinct black band runs from the mouth through the eye and up to the front of the dorsal fin. The band can lighten to be almost nonexistent or darken dramatically. It is typically fairly prominent in the almaco jack. From the front, the almaco is shaped like a slender oval.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Greater Amberjack (*Seriola dumerili*), Lesser Amberjack (*Seriola fasciata*), Banded Rudderfish (*Seriola zonata*)

See Positive Identification of SharkCam Amberjack Species for a discussion of visually distinguishing characteristics.

Greater Amberjack

***Seriola dumerili* (Risso, 1810)**
Carangidae

Distinguishing characteristics:
A greater amberjack has a deeply forked tail and rather pointed fins (including both lobes of tail), characteristics it shares with other members of the jack family. From the side, the body resembles an elongated oval that is about four times as long as it is tall. The greater amberjack has a short dorsal fin and a color that ranges from silvery gray to amber, with a darker pectoral fin. A black bar, called a nuchal band, runs from the mouth through the eye and up to the front of the dorsal fin. The nuchal band can lighten to be almost nonexistent or darken dramatically.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: Lesser Amberjack (*Seriola fasciata*), Banded Rudderfish (*Seriola zonata*), Almaco Jack (*Seriola rivoliana*)

See Positive Identification of SharkCam Amberjack Species for a discussion of visually distinguishing characteristics.

Lesser Amberjack

***Seriola fasciata* (Bloch, 1793)**
Carangidae

Distinguishing characteristics:
The lesser amberjack, like other jack species, possesses pointed fins and a deeply forked tail. The body is a smooth silvery-gray, shaped like an elongated oval, and from the side has an almost flat appearance. It possesses a bold brown stripe, the nuchal band, which runs from the mouth, through the eye, and up toward the start of the dorsal fin. This band can vary in prominence, but on the lighter amberjack tends to contrast well against the rest of the fish.

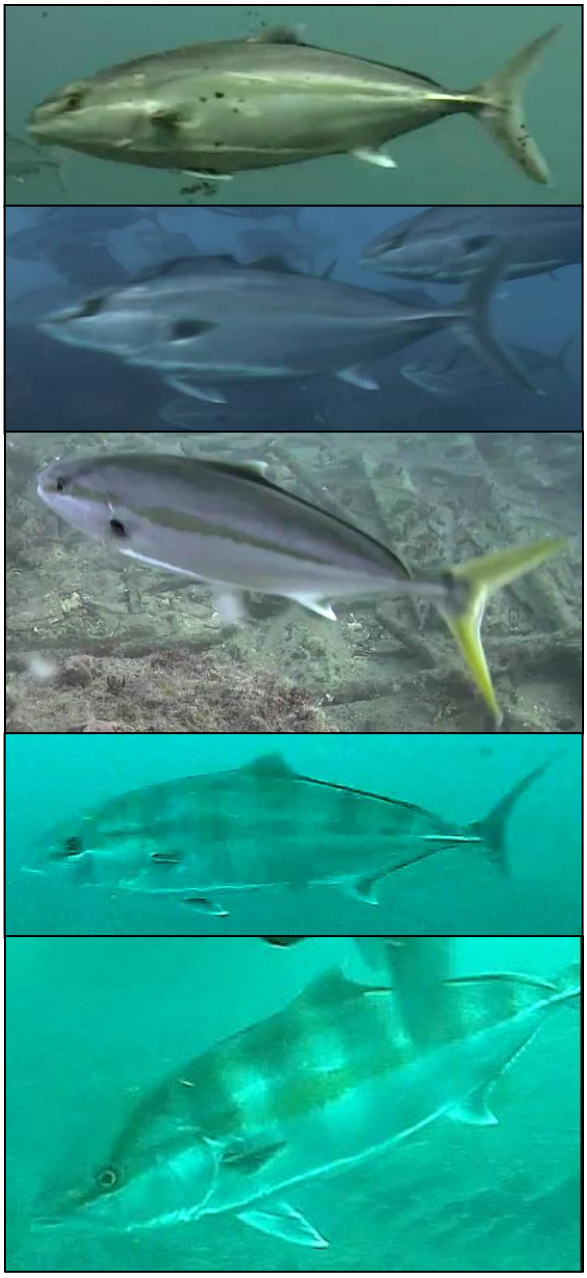
Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Greater Amberjack (*Seriola dumerili*), Banded Rudderfish (*Seriola zonata*), Almaco Jack (*Seriola rivoliana*)

See Positive Identification of SharkCam Amberjack Species for a discussion of visually distinguishing characteristics.

Banded Rudderfish

***Seriola zonata* (Mitchill, 1815)**
Carangidae



Distinguishing characteristics:
A banded rudderfish has a light-colored body shaped like an elongated oval. It has a dark band which runs from the mouth, across the eye, to the front of the dorsal fin. The band can lighten to be almost nonexistent or darken dramatically. Banded rudderfish often have a single, faded bronze horizontal stripe running from the eye to the tail.

Banded rudderfish may have six dark bars spaced along its body.

Banded rudderfish are most frequently seen in schools numbering in the dozens. Adult banded rudderfish, or those lacking bars, are easily mistaken for greater amberjacks on SharkCam.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

NOTE: Juveniles are reported to lose their bars when they are about 28 cm (11 in) long, but some individuals seen on SharkCam appear to be much larger than that size while still retaining faded bars. This is likely social communication or related to excitement.

Similar species: Greater Amberjack (*Seriola dumerili*), Lesser Amberjack (*Seriola fasciata*), Almaco Jack (*Seriola rivoliana*)

See Positive Identification of SharkCam Amberjack Species for a discussion of visually distinguishing characteristics.

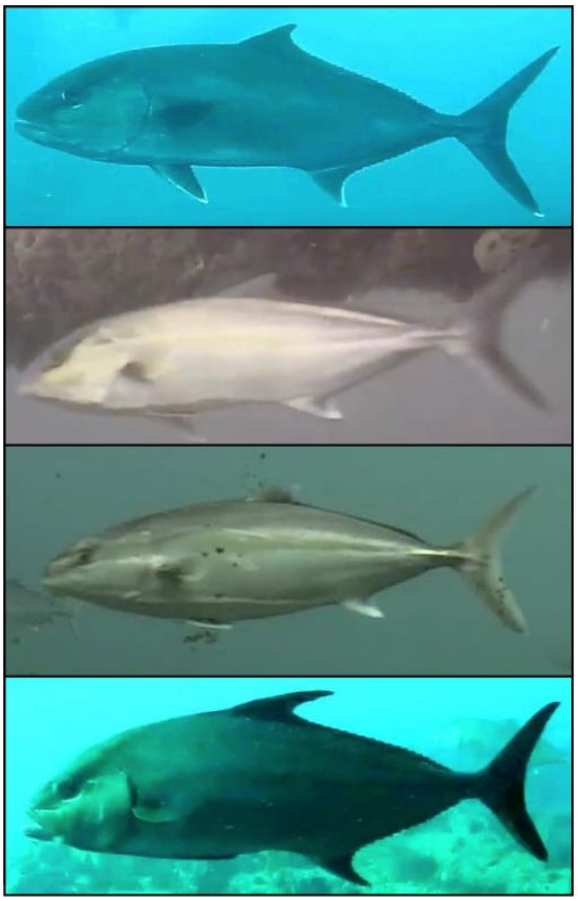
Positive Identification of SharkCam Amberjack Species

Four species of amberjacks (genus *Seriola*) are seen on SharkCam: greater amberjack, lesser amberjack, banded rudderfish, and almaco jack. These fish are notoriously difficult to tell apart, to the point where image searches for one species often turn up misidentified images of others.

Complicating matters, color and pattern—the most readily available visual traits for most viewers—are only somewhat reliable, as they can vary by individual and individual behavior. When identifying amberjacks from video, morphological traits like fin and body shape should be paid the most attention, with coloration, body patterns, and relative size used as aids. On SharkCam, greater amberjack and almaco jack are often seen, with lesser amberjack and banded rudderfish being rare.

Similar species: Almaco Jack (*Seriola rivoliana*), Banded Rudderfish (*Seriola zonata*), Greater Amberjack (*Seriola dumerili*), Lesser Amberjack (*Seriola fasciata*)

Relative frequency: Frequent → Rare
● ● ● ● ● Greater Amberjack > ● ● ● ● Almaco Jack > ● Banded Rudderfish > ● Lesser Amberjack
Relative size: Large → Small (of typical individuals)
○ ○ ○ ○ ◌ Greater Amberjack > ○ ○ ○ ◌ Banded Rudderfish > ○ ○ ○ ◌ Almaco Jack > ○ ○ ○ ◌ Lesser Amberjack



Top to bottom: greater amberjack, lesser amberjack, banded rudderfish, almaco jack

Greater amberjack, lesser amberjack, and banded rudderfish have the most similar silhouettes, with the almaco jack body shape most distinct from the others. The almaco jack body is teardrop-shaped and deeper than the others (about three and quarter times as long as it is deep), with a distinctly high, sickle-shaped dorsal fin. Greater and lesser amberjacks are about four times as long as their bodies are deep, while the banded rudderfish appear rounder, streamlined, and torpedo-like than the other amberjacks, with a length to depth ratio of about three and a half lengths to the body depth.

As adults, greater amberjack is typically the largest (longest) of these four species. The average individual banded rudderfish is smaller than the typical greater amberjack. Banded rudderfish and almaco are often similar in size, and of the two, banded rudderfish are typically larger. The lesser amberjack is usually the smallest (or at least shortest), although occasionally small almacos will be seen, but these are distinguishable by other features.

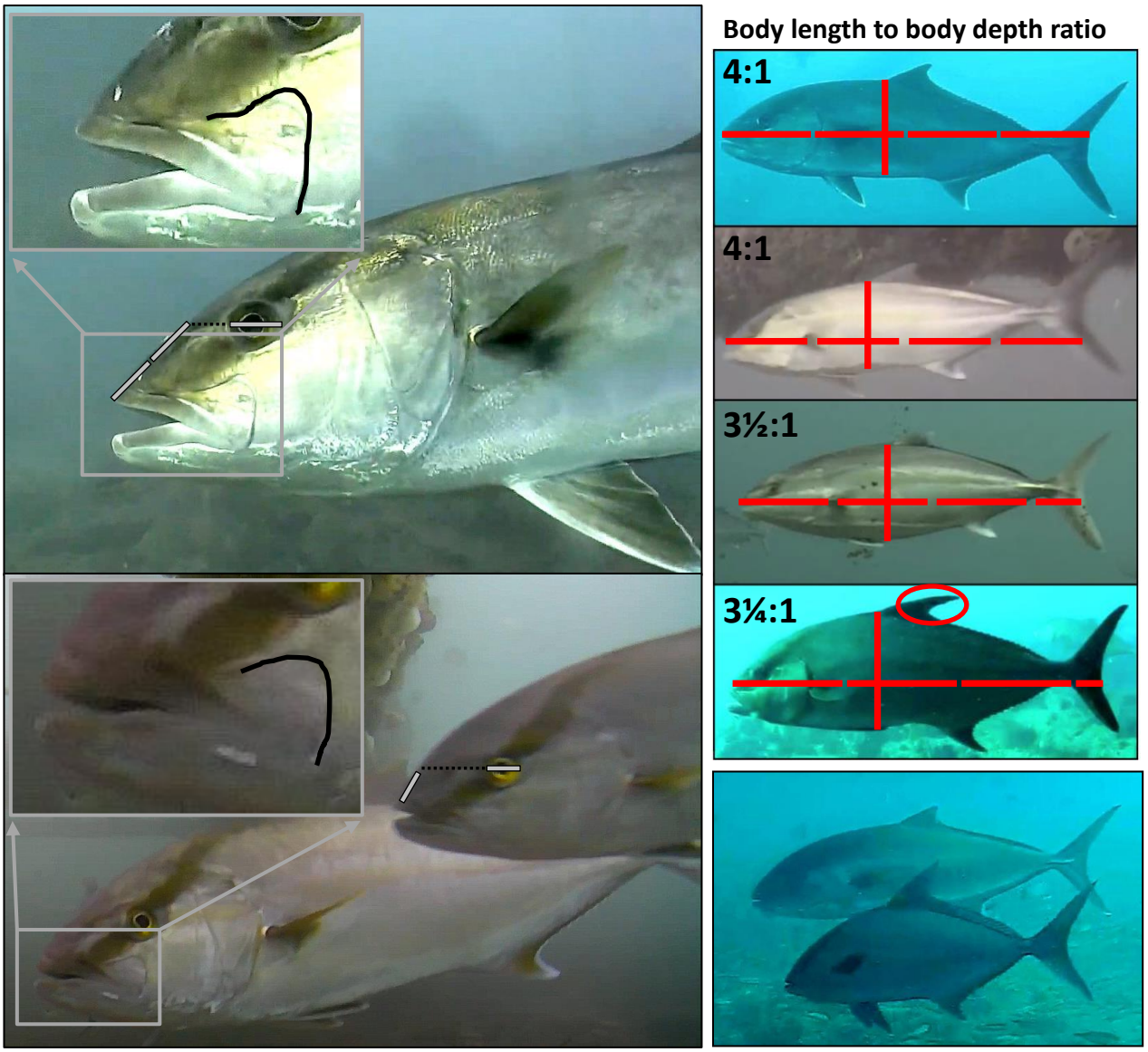
Banded rudderfish may possess remnants of their juvenile barring, even at larger sizes, and they appear to have the ability to darken and lighten to invisibility these bars, especially if excited. Banded rudderfish are also more likely than the others to possess a single, faded bronze stripe running from the eye to the tail.

Greater and lesser amberjack are especially difficult to distinguish. When greater and lesser amberjack are close to each other, the size difference is noticeable—the greater amberjack is at least twice as large. However, size on SharkCam is difficult to judge. Viewers should consider the relative sizes of other fishes which are relatively standardized (spottail pinfish are especially good for this) when making comparisons of relative and absolute size.

The greater amberjack's body is proportionally longer, sometimes reaching an almost rectangular silhouette in large individuals, and has a more robust or powerful appearance than the lesser amberjack and banded rudderfish. The lesser amberjack is often pale in color, while the greater amberjack's color ranges to a dark amber. The nuchal bands (eye stripes) of the lesser amberjack are brown and tend to contrast starkly against its pale scales; on the greater amberjack, this band is darker brown, but tends to fade into the other scales. From a distance, the golden-

yellow eye of the lesser amberjack tends to stand out much better than that of the greater amberjack. Close inspection may reveal that the diameter of the lesser amberjack's eye is about equal to the length of its snout, while on the greater amberjack the snout is 1½ to 2 times longer than the eye diameter.

In movement and behavior, greater amberjack have larger, heavier tail beats than the other amberjacks. Lesser amberjack tend to form large shoals of their own species or join up with similarly-sized almaco jacks, while greater amberjack rarely travel in groups of more than a few individuals, unless actively hunting, when they may be seen in larger groups or mixed with other amberjack species. Banded rudderfish have been most often seen in the company of many others of their species. Lesser amberjack have rarely been seen traveling with greater amberjack, and in this case the size difference becomes readily apparent.



Left: greater amberjack; bottom: lesser amberjack; insets: comparison of the maxillary square. Snout length in greater amberjack is 1½ to 2 times the diameter of the eye, while in lesser amberjack, snout length is approximately equal to eye diameter. The maxillary square of the greater amberjack is distinctly knobbed toward the eye, while in the lesser amberjack it is rounder. Top right: Body length to depth ratios of (top to bottom images) greater amberjack, lesser amberjack, banded rudderfish, and almaco jack. Note the distinctive sickle-shaped dorsal fin of the almaco jack. Bottom right: Comparison of the body shape and relative size of almaco jack (foreground) and greater amberjack (background). Image credits with Explore.org: (left) Pilotfish and Erin Burge, (top right) jon-newbie and Erin Burge, (bottom right) Brendan Morgan.

Horse-eye Jack

***Caranx latus* Agassiz in Spix and Agassiz, 1831**
Carangidae

Distinguishing characteristics:
A horse-eye jack shares several characteristics with other members of the jack family: a deeply forked tail, rather pointed fins (including both lobes of tail), a slender body cross section, and a silvery-gray body color. From the side, its body is oval-shaped with a large eye that has a diameter that approximately equals the distance from the eye to the snout. The horse-eye jack has a narrow dark stripe that runs from the tail about ⅓ of the way to the mouth. The dorsal fin is often dark and the pelvic and anal fins are tipped with white. Its tail is usually bright yellow.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Blue Runner (*Caranx crysos*), Bar Jack (*Carangoides ruber*), Yellow Jack (*Carangoides bartholomaei*), Yellowtail Snapper (*Ocyurus chrysurus*)

Several other jack species can be confused with the horse-eye jack but lack its large eyes and dark stripe, and have their own distinguishing features. The blue runner has a dark tip on the tail lobes and two short, bright white horizontal lines, one above the base of the pectoral fin and one at the base. The bar jack has a dark stripe along the dorsal fin and down to the lower lobe of the tail, accompanied by a bright blue or white line beneath it. The fins of the yellow jack have a yellow cast, especially the lower lobe of the tail. The crevalle jack has a dark spot just above the pectoral fin.

Although not a jack, the yellowtail snapper has a similar shape, light coloring, and a forked yellow tail with pointed lobes. Unlike the horse-eye jack, the yellowtail snapper also has a yellow stripe that runs from the tail towards the eye, turning dark as it goes.

Blue Runner

***Caranx crysos* (Mitchill, 1815)**
Carangidae

Distinguishing characteristics:
A blue runner shares several characteristics with other members of the jack family: a deeply forked tail, rather pointed fins (including both lobes of tail), and a slender body cross section. The body color ranges from a silvery-gray to a silvery blue. From the side, the body is oval-shaped and with dark tips to its tail. SharkCam blue runners show two short, bright white horizontal lines, one above the base of the pectoral fin and one below the eye. The white lines show up well even under poor lighting conditions and when the fish moves rapidly.

This is the jack most likely to be seen in large schools or groups, especially when round scad are abundant.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Bar Jack (*Carangoides ruber*), Horse-eye Jack (*Caranx latus*), Yellow Jack (*Carangoides bartholomaei*), Bluefish (*Pomatomus saltatrix*)

Several other jack species can be confused with the blue runner but lack the blue runner's bright white lines and have their own distinguishing features.

The bar jack has a dark stripe along its dorsal fin and down to the lower lobe of its tail, accompanied by a bright blue or white line beneath it.

The horse-eye jack has large eyes and usually has a bright yellow tail and a narrow, dark stripe that runs from the tail about half way to the mouth.

The fins of the yellow jack have a yellow cast, especially the lower lobe of the tail.

Although not a jack, the bluefish has a similar shape and silvery-gray color. It is distinguished from the blue runner by the larger head, prominent lower jaw, thicker tail, and more elongated body.

Rainbow Runner

***Elagatis bipinnulata* (Quoy and Gaimard, 1825)**
Carangidae

Distinguishing characteristics:
From the side, a rainbow runner is shaped like a slender oval with a rather pointed head. The tail is jack-like, deeply forked with pointed lobes, and is bright yellow. The body is light gray below and darker gray above, with two bright, light blue, almost white, stripes down the middle.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Cobia (*Rachycentron canadum*), Yellowtail Snapper (*Ocyurus chrysurus*)

The cobia has a similar body shape, but with a flattened head, a large, shallowly forked tail with sharp tips, and a tall, triangular dorsal fin. The cobia overall coloration is dark, although it may have some lighter tones underneath, and the tail is not yellow. All cobia seen on SharkCam have been substantially larger than a rainbow runner.

The yellowtail snapper has a forked yellow tail with pointed lobes, like the rainbow runner. Unlike the rainbow runner, the yellowtail snapper also has a stripe that starts as yellow at the tail and runs towards the snout, becoming darker towards the eye.

Yellow Jack

***Carangoides bartholomaei* (Cuvier in Cuvier and Valenciennes, 1833) Carangidae**

Distinguishing characteristics:
A yellow jack shares several characteristics with other members of the jack a deeply forked tail, rather pointed fins (including both lobes of the tail), a slender body cross section, and a silvery-gray color. From the side, the body is oval-shaped. The yellow jack's fins have a yellow cast, especially the lower lobe of the tail.

NOTE: Many sources use the alternate scientific name *Caranx bartholomaei* for the yellow jack. We have followed the current classification for this species from the Integrated Taxonomic Information System.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Horse-eye Jack (*Caranx latus*), Blue Runner (*Caranx crysos*), Bar Jack (*Carangoides ruber*), Yellowtail Snapper (*Ocyurus chrysurus*)

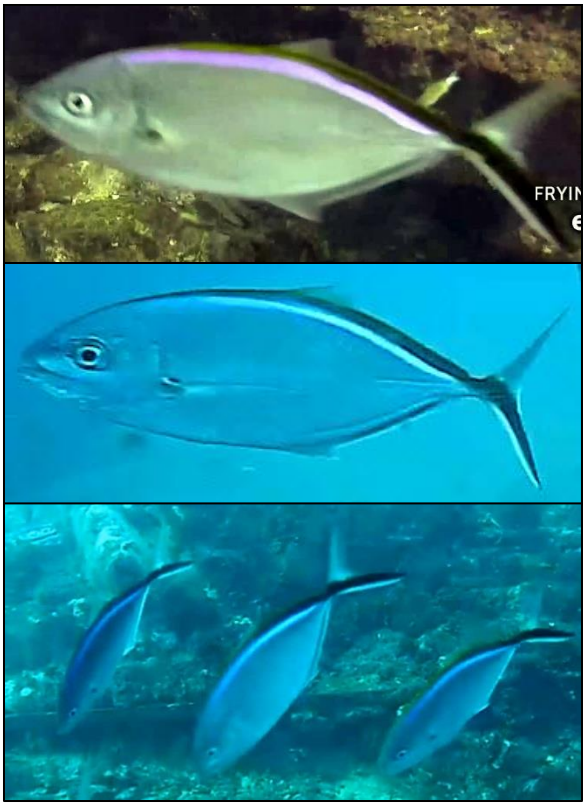
Other jack species share with the yellow jack the several characteristics of the jack family. The horse-eye jack usually has a yellow tail like the yellow jack but also has big eyes and a narrow, dark stripe that runs from the tail about half way to the mouth.

The blue runner and the bar jack have no yellow color to their fins and have their own distinguishing characteristics. The blue runner has a dark tip on the tail lobes and two short, bright white horizontal lines, one above the base of the pectoral fin and one at the base. The bar jack has a dark stripe along its dorsal fin and down to the lower lobe of its tail, accompanied by a bright blue or white line beneath it.

Although not a jack, the yellowtail snapper has a similar shape, light coloring, and a deeply forked tail that shows yellow. Unlike on the yellow jack, on the yellowtail snapper the yellow of the tail extends as a stripe towards the snout, turning darker towards the eye.

Bar Jack

***Carangoides ruber* (Bloch, 1793)**
Carangidae



Distinguishing characteristics:
A bar jack shares several characteristics with other members of the jack a deeply forked tail, rather pointed fins (including both lobes of tail), and a slender body cross section. The body color ranges from a silvery-gray to a silvery blue. From the side, the body is oval-shaped, with a dark stripe that runs along the dorsal fin to the lower lobe of the tail. A bright, light blue, almost white stripe runs beneath the black stripe. A white "mustache" shows above the mouth.

When swimming, a bar jack wriggles much of its body, a motion that is unlike the other jacks. Bar jacks seen on SharkCam are typically juveniles and often travel in small schools.

NOTE: Many sources use the alternate scientific name *Caranx ruber* for the bar jack. We have followed the current classification for this species from the Integrated Taxonomic Information System.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Blue Runner (*Caranx crysos*), Horse-eye Jack (*Caranx latus*), Yellow Jack (*Carangoides bartholomaei*)

Several other jack species can be confused with the bar jack but lack the bar jack's bright blue and black stripes and have their own distinguishing features.

The blue runner has a dark tip on the tail lobes and two short, bright white horizontal lines, one above the base of the pectoral fin and one at the base.

The horse-eye jack has very large eyes and usually has a bright yellow tail and a narrow, dark stripe that runs from the tail about half way to the mouth.

The fins of the yellow jack have a yellow cast, especially the lower lobe of the tail.

Bigeye Scad

***Selar crumenophthalmus* (Bloch, 1793)**
Carangidae

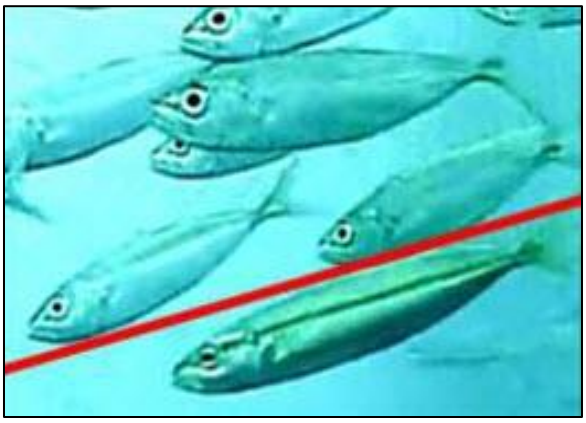
Distinguishing characteristics:
Although small, generally 4 to 6 inches long, bigeye scad show several jack characteristics: silvery-gray coloration, deeply forked tail, rather pointed fins (including both lobes of tail), and a slender cross section. From the side it is shaped like an elongated oval and may show a small dark spot above the pectoral fin. As its name implies, its eye is large, having a diameter as great as or greater than the distance between its eye and the end of its snout. Depending on lighting angles, the bigeye might show a metallic sheen. This is a schooling fish, often forming schools of thousands.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ◌ Very small (<10 cm or 4 in) to Small (10–20 cm or 4–8 in)

Similar species: Round Scad (*Decapterus punctatus*), Scaled Herring (*Harengula jaguana*), young Tomtate (*Haemulon aurolineatum*)

The round scad has the same jack characteristics as the bigeye scad and a similar elongated oval but its body is more slender. The eye is smaller on the round scad, the diameter being less than the distance between its eye and the end of its snout.

Often seen in and around schools of round scad, young tomtates have a dark blotch at the base of the tail, a feature the bigeye scad does not have.



Comparative view of bigeye scad (above), round scad (below)

Round Scad

***Decapterus punctatus* (Cuvier, 1829)**
Carangidae

Distinguishing characteristics:
Although small, generally 6 to 8 inches long, a round scad shares several characteristics with other members of the jack silvery-gray coloration, deeply forked tail, rather pointed fins (including both lobes of tail), and a slender cross section. From the side it is shaped like a slender oval and shows a dark spot above the pectoral fin. The diameter of its eye is less than the distance between its eye and the end of its snout. Occasionally it shows a yellow tail and a darkened stripe mid-body. This is a schooling fish, often forming schools of thousands.

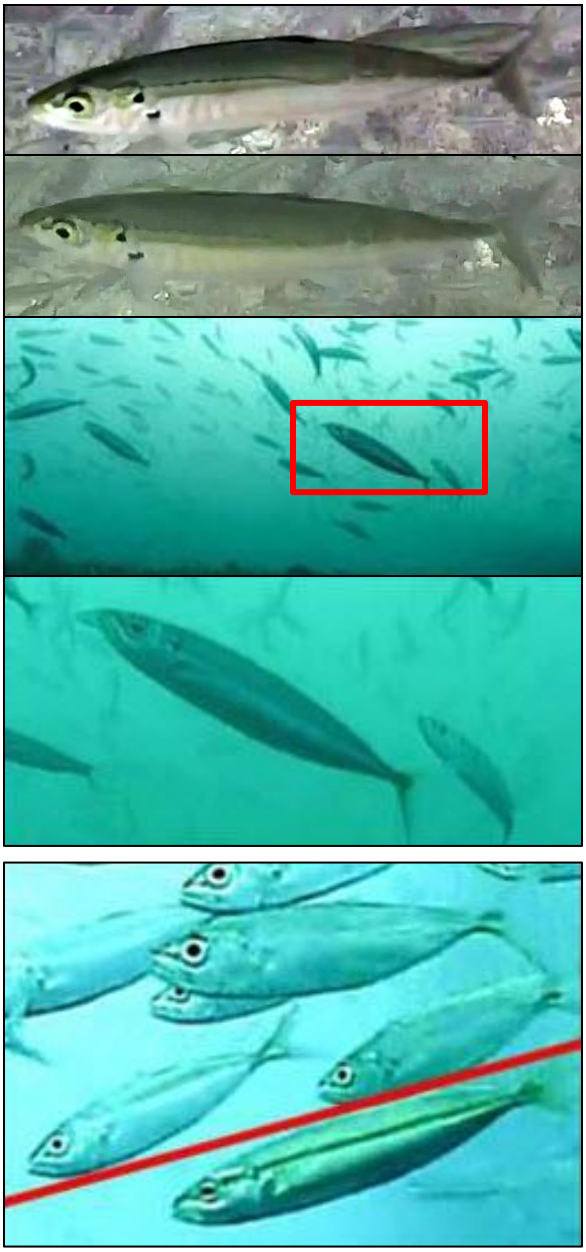
NOTE: Round scad are an extremely important forage fish for larger predators including, groupers, snappers, and jacks. They are harvested commercially and recreationally as baitfish. Round scad are frequently known as cigar minnows in this context.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Bigeye Scad (*Selar crumenophthalmus*), Scaled Herring (*Harengula jaguana*), young Tomtate (*Haemulon aurolineatum*)

The bigeye scad has the same jack characteristics as the round scad and the same general body shape but its body is deeper (proportionately taller). Its eye is larger, the diameter being equal to or greater than the distance between its eye and the end of its snout.

Often seen in and around schools of round scad, young tomtates have a deeper body and a dark blotch at the base of the tail, features the round scad does not have.



Comparative view of bigeye scad (above), round scad (below)

Scaled Herring

***Harengula jaguana* Poey, 1865**
Clupeidae

Distinguishing characteristics:
Scaled herring are a small, generally 4 to 6 inches long, silvery schooling fish seen rarely on SharkCam. It is typically seen in large schools of similarly sized individuals. Depending on lighting conditions, the back is light blue, fading to silver or white on the flanks. The body is compressed, laterally flattened, relative to other small, schooling fishes. The tail fin is deeply forked, although this may not be obvious given its clear color. The only distinguishing characteristic seen may be the flat, relatively large upper lip. This flattened upper lip is a characteristic of the herring and sardine family, Clupeidae. The eye is relatively large.

Images from the web of scaled herring show that the species has relatively large, prominent scales, a feature not seen on SharkCam to date.

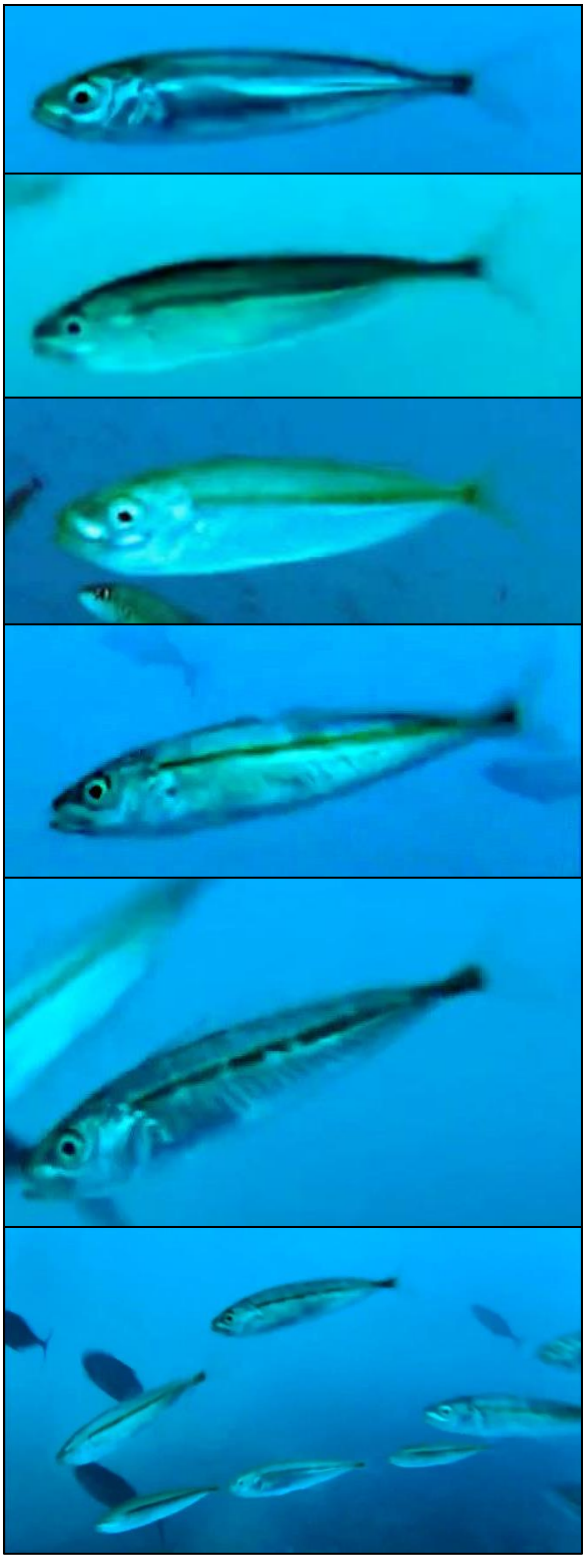
Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Scaled herring, or a close relative, are very common at Frying Pan Tower seasonally based on diver observations, but given their small size and fast movement they are rarely positively identified on SharkCam.

Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Round Scad (*Decapterus punctatus*), Bigeye Scad (*Selar crumenophthalmus*)

The scaled herring closely resembles a round or bigeye scad in body profile and size. It is distinguished from both by the relatively large, flattened upper lip, characteristic of its family. This is a feature neither round nor bigeye scad possess. The body is relatively thin in cross section, similar to the compressed but deep-bodied bigeye scad, and in contrast to the rounded body cross section of the round scad.



Northern Sennet

***Sphyraena borealis* DeKay, 1842**
Sphyraenidae

Distinguishing characteristics:
Northern sennet are diminutive barracudas with a bright silvery body, a deeply forked tail fin, a relatively large eye, and a sharply pointed snout. The body is round in cross section and noticeably long and slender for its depth, similar to its much larger relative, the great barracuda. The mouth ends before the beginning of the eye.

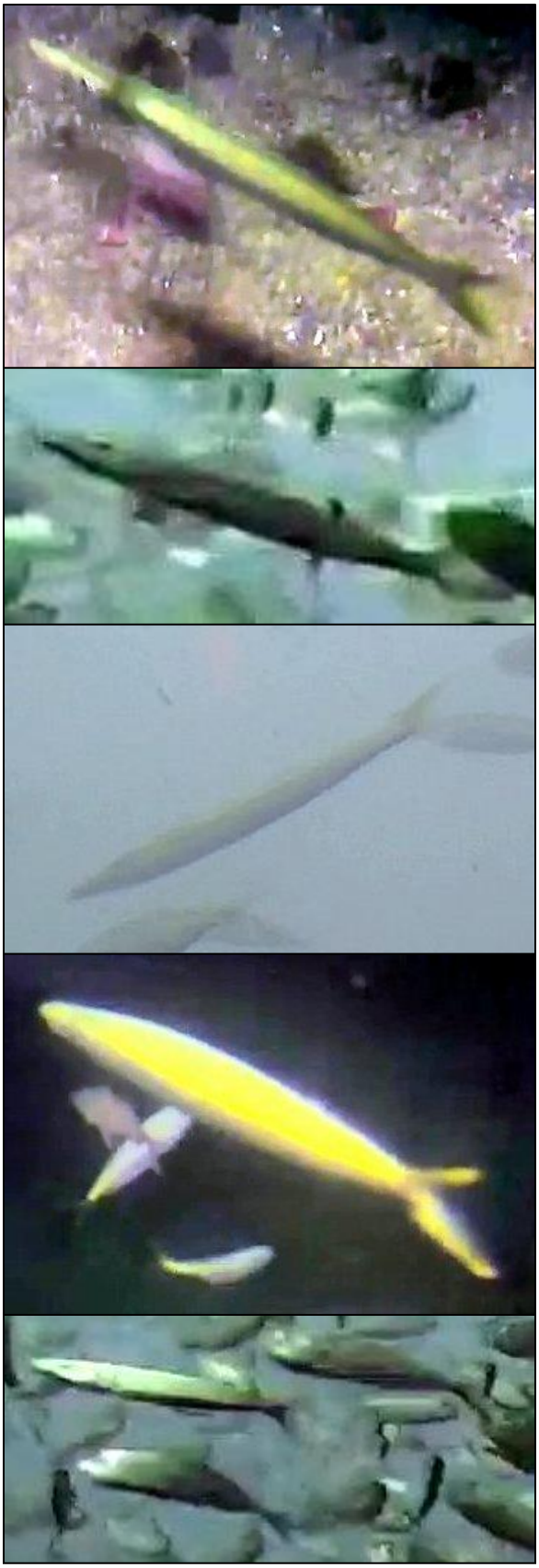
On SharkCam, obvious body markings have not been apparent. A closer approach to the camera in clearer water will reveal small, darkened blotches and two yellow stripes on the flanks. Sightings on SharkCam are limited and have only been in the context of mixed-species schools of round and bigeye scad, and young tomtates of similar size. Typically, sennet will school with similarly sized individuals of their species.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Round Scad (*Decapterus punctatus*), Bigeye Scad (*Selar crumenophthalmus*), Scaled Herring (*Harengula jaguana*)

Northern sennet are clearly distinguished from other small schooling fishes, like round scad, bigeye scad, and scaled herring by how slender and long they appear relative to the other three species. The sharply pointed snout also distinguishes them from their school mates.

Northern sennet are not likely to be mistaken for their massively larger relative, the great barracuda.



Bluefish

***Pomatomus saltatrix* (Linnaeus, 1766)**
Pomatomidae

Distinguishing characteristics:
Bluefish are elongated, somewhat compressed fish, with a prominent lower jaw. They are silvery-gray with the back darker and fading to a white belly. There is a matte finish to the body that typically has no other marks or patterns, except for a prominent dark patch at the base of the pectoral fin. The first dorsal fin is small and frequently folded. The larger second dorsal fin begins past the midpoint of the body and is symmetric with the anal fin. Both fins are similar in size and shape. The caudal fin is deeply forked.

Bluefish are voracious feeders and individuals frequently have penetrating wounds inflicted by other bluefish during pack hunting and feeding.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Blue Runner (*Caranx crysos*)

Bluefish and blue runners frequently travel in large groups of similarly-sized individuals of their species. The blue runner is distinguished from the bluefish by its jack family characteristics, and also a less elongated body, smaller head, and thin tail.

Tarpon

***Megalops atlanticus* Valenciennes in Cuvier and Valenciennes, 1847 Megalopidae**

Distinguishing characteristics:
Tarpon are large, bright silvery, elongated fish with a small head and strongly upturned mouth with a lower jaw well forward of the upper jaw. The flanks of the fish are vertical. The scales are very large, but may not be visible except on a close approach to SharkCam. The dorsal fin is tall, shark-like, and originates past the midpoint of the body. It is mirrored by a triangular anal fin midway between the dorsal fin and caudal fin. The caudal fin is deeply forked.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Tarpon have only been reported from SharkCam a few times. A large individual was seen several times on 10 March and 30 November 2018, and a pair was seen on 8 May 2021.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: No other fish seen on SharkCam resembles the tarpon.

Great Barracuda

***Sphyraena barracuda* (Edwards in Catesby, 1771)**
Sphyraenidae

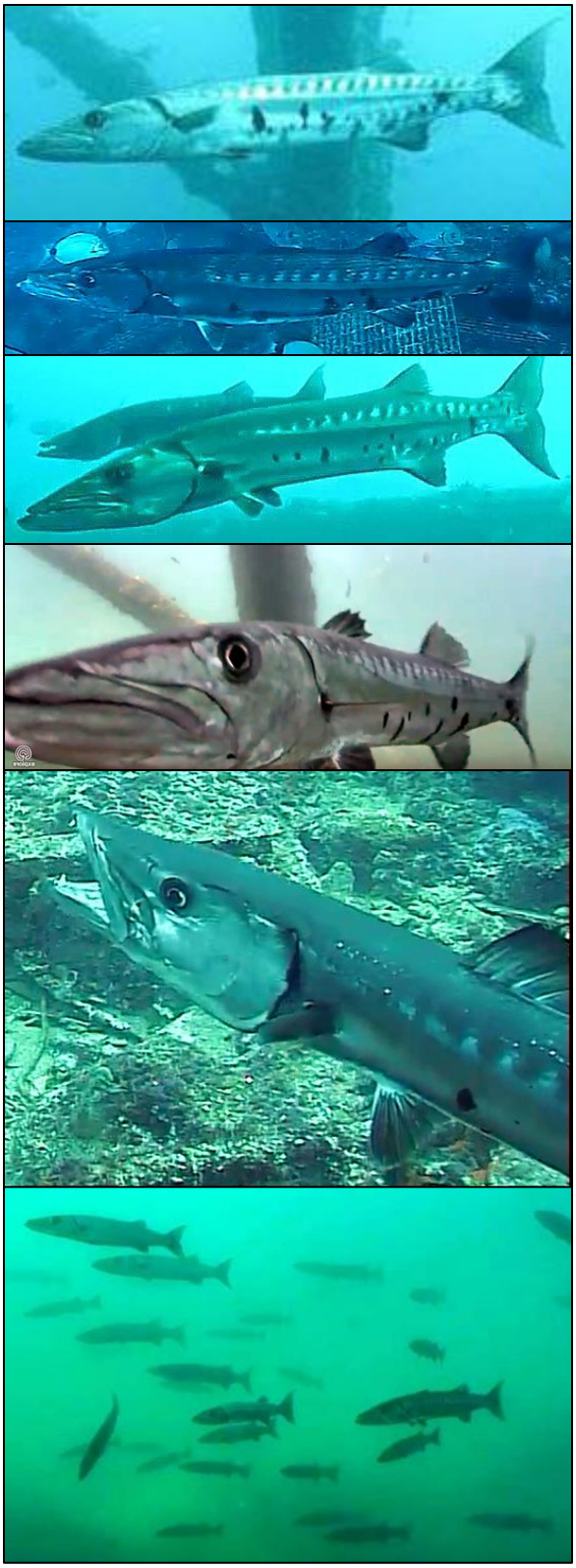
Distinguishing characteristics:
The great barracuda is long and slender with a flattened head, a protruding lower lip, and a large, squared-off tail with an indentation in the center and longer fin tips. The mouth ends below the eye and a close approach to the camera or open mouth will reveal large canine teeth.

Often only the second dorsal fin shows, located far back on the body above the anal fin. Individuals frequently hang motionless, or almost motionless, with the body tilted slightly lower at the head. The body may be all dark or silvery gray with a row of lighter-toned rectangular markings ("windows") and indistinct dark-to-black blotches along the midline and belly.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: King Mackerel (*Scomberomorus cavalla*)

Although both the king mackerel and great barracuda are long and slender, the great barracuda is readily distinguished by the length of the head. The great barracuda head is approximately ¼ of the total body length, and the mouth is long, while the head length of the king mackerel is a small fraction of the body length and the mouth is short. The eye of the great barracuda is also significantly larger than the relatively small eye of the king mackerel. King mackerel lack obvious body markings, in contrast to the windows and indistinct black blotches of the great barracuda belly. Behaviorally great barracuda will frequently hang motionless or move slowly through the water. King mackerel will be in constant, usually straight line, motion.



King Mackerel

***Scomberomorus cavalla* (Cuvier, 1829)**
Scombridae

Distinguishing characteristics: King mackerel are long, torpedo-shaped fish with a short head and a deeply forked tail fin. They appear very streamlined and will always be in motion. Symmetric, triangular dorsal and anal fins are positioned just posterior of the mid-line of the body. The upper fin is the second dorsal. Most of the time the first dorsal fin is folded into a groove in the forward third of the body. If seen, it is silvery-gray. Markings on the body are subtle, especially at a distance, and unlikely to be seen on SharkCam.

NOTE: King mackerel are migratory, with adult fish inhabiting SharkCam waters from late spring to early fall and spending the winter off south Florida.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: Great Barracuda (*Sphyraena barracuda*)

Although both the great barracuda and king mackerel are long and torpedo-shaped, the great barracuda is readily distinguished by the length of the head. The great barracuda head is approximately ¼ of the total body length, and the mouth is long, while the head length of king mackerel is a small fraction of the body length and the mouth is short. The eye of the great barracuda is also significantly larger than the relatively small eye of the king mackerel. Body markings of the great barracuda include a row of lighter-toned rectangular markings ("windows") and indistinct dark-to-black blotches along the midline. King mackerel lack obvious body markings.

Another species of large mackerel, the cero (*Scomberomorus regalis*), is rarely reported from North Carolina, and has not been confirmed on SharkCam. Verification as a cero will require that the black first dorsal fin and golden-yellow midline stripe be visible.

Atlantic Bonito

***Sarda sarda* (Bloch, 1793)**
Scombridae

Distinguishing characteristics:
Atlantic bonitos show up on SharkCam when large schools of small prey fish are present. The bonitos swim through the schools so fast that the camera can only catch blurry images of them. Generally, all that is seen is some portion of the narrow black lines on the upper half of the light-colored body and a hint of the body shape and fins. The lines are straight and slope up from front to back, especially towards the tail. From the side the body is a streamlined oval, with the halves above and below the midline about the same height. The dorsal fin is rather short at the leading edge and slopes down gradually to the even shorter trailing edge of the fin. The bonito seems to zoom straight past the camera, seldom making quick turns.

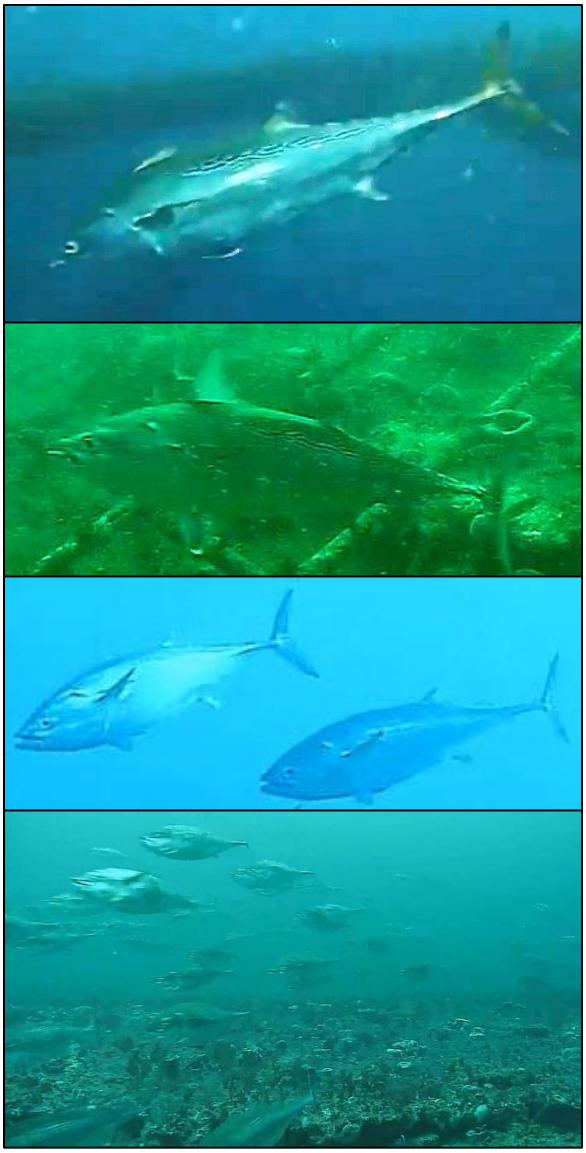
Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Little Tunny (*Euthynnus alletteratus*)

Atlantic bonitos are often seen with little tunnies. The tunny is difficult to distinguish from the bonito on SharkCam. The tunny looks slightly deeper bodied, and its body lines are wavy and horizontal, as compared to the bonito's straight lines that slope up. The tunny's tall dorsal fin shows a sharp curve down from the leading edge to the shorter rest of the fin, and the tunny noticeably erects its dorsal fin when making a quick turn at high speed. The bonito seldom makes quick turns at high speed and its dorsal fin is shorter and forms a straighter line from leading to trailing edges.

Little Tunny

***Euthynnus alletteratus* (Rafinesque, 1810)**
Scombridae



Distinguishing characteristics:
Little tunnies show up on SharkCam when large schools of small prey fish are present. They swim through the schools so fast that the camera only catches blurry images of them. Generally, all that is seen is a hint of the body shape and fins. From the side, the body is a streamlined oval that is slightly taller from the midline down than from the midline up. The body silhouette is distinctly shaped like an American football.

If the fish is even with or below the camera, the viewer might see some portion of narrow black lines on the upper part of the light colored body. The lines are wavy ("worm-like"). At the head end, the lines are short and many go in different directions. From mid-body to the tail, the lines form a horizontal pattern. The dorsal fin is rather tall at the leading edge and curves down sharply to the shorter rest of the fin. The dorsal fin is visibly erect when the tunny makes a quick turn at high speed.

NOTE: Little tunny have several frequently used alternate common names, including false albacore, little tuna, bonita, and albie.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Atlantic Bonito (*Sarda sarda*)

The Atlantic bonito is difficult to distinguish from the little tunny on SharkCam. The bonito looks slightly more streamlined (less deeply bodied), and the lines on its body are straight and slope up from head to tail, as compared to the tunny's wavy and horizontal lines. The bonito seldom makes quick turns at high speed, unlike the tunny. The bonito's dorsal fin is noticeably shorter than the tunny's and forms an almost straight line from the leading to the trailing edges, as compared to the sharp curve in the tunny's dorsal fin.

Atlantic Spadefish

***Chaetodipterus faber* (Broussonet, 1782)**
Ephippidae

Distinguishing characteristics:
Atlantic spadefish are deep-bodied and narrow. They have a unique shape among SharkCam fish. From the side, its outstretched dorsal and anal fins give the fish an outline that is roughly triangular, like a spade with a rounded end. Body and fin coloration are silver to gray with dark borders on the fins and varying numbers of dark bars on the body (the bars fade, one by one, with age).

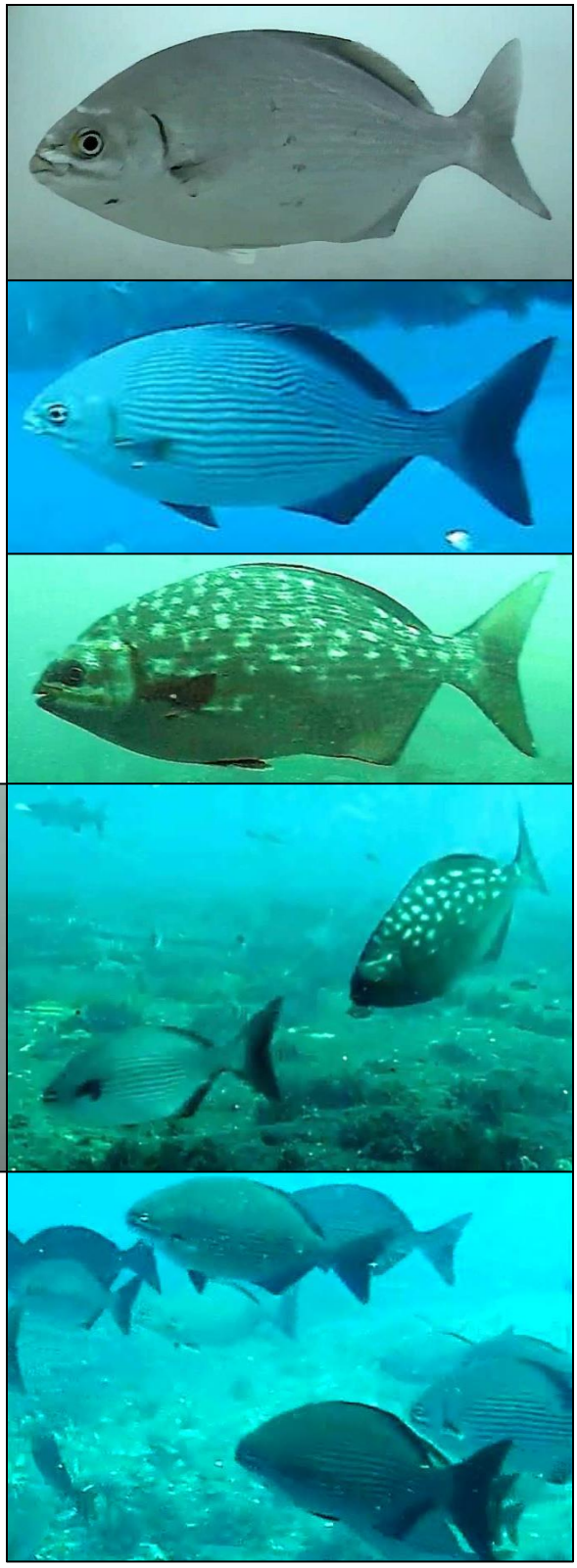
Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: O O O Medium (20 cm–0.5 m or 8–20 in)

Similar species: Sheepshead (*Archosargus probatocephalus*)

The sheepshead has dark bars like the Atlantic spadefish usually does. However, the sheepshead outline is oval shaped, unlike the spadefish's triangular shape. Also, unlike the spadefish, the sheepshead body is lighter colored, generally white or off-white, with a gray head.

Bermuda Chub

***Kyphosus sectatrix* (Linnaeus, 1758)**
Kyphosidae



Distinguishing characteristics:
From the side, the Bermuda chub's body is oval shaped, with the dorsal and anal fins giving the fish a slightly egg-shaped outline. Bermuda chub's have a shallowly forked tail fin.

A short white "mustache" shows above the mouth. Color is highly variable**:** body and fins all light; body light and fins varying degrees of dark, and body and fins varying degrees of dark. Close up, narrow alternating dark and light stripes can be seen on the body. When a Bermuda chub gets excited, it becomes dark with large, contrasting light spots (spotted phase).

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Spottail Pinfish (*Diplodus holbrookii*)

NOTE: Recent taxonomic revisions within the sea chubs (Kyphosidae) conclude that there are four distinct species found circumglobally, including in the tropical western Atlantic Ocean, inclusive of Frying Pan Tower. They are *Kyphosus sectatrix*, *K. bigibbus*, *K. cinerascens*, and *K. vaigiensis*. All are visually similar, although differentiating them from field observations has been reported (see Shorefishes of the Greater Caribbean). These revisions and the requirement for close observation make a definitive identification of sea chubs seen on SharkCam very difficult.

Bermuda chubs and spottail pinfish are often seen together. The spottail pinfish is also oval shaped with a shallowly forked tail, but it has a dark band around the base of its tail and its body is always light colored. When seen together, the Bermuda chub's larger size is apparent. In silhouette, the Bermuda chub's slightly egg-shaped outline distinguishes it from the spottail pinfish.

COLORFUL OVALS (16)

Surgeonfishes–Acanthuridae
- Blue Tang
- Doctorfish
- Ocean Surgeon
- Surgeonfishes (Blue Tang, Doctorfish, Ocean Surgeon)

Butterflyfishes–Chaetodontidae
- Banded Butterflyfish
- Reef Butterflyfish
- Spotfin Butterflyfish

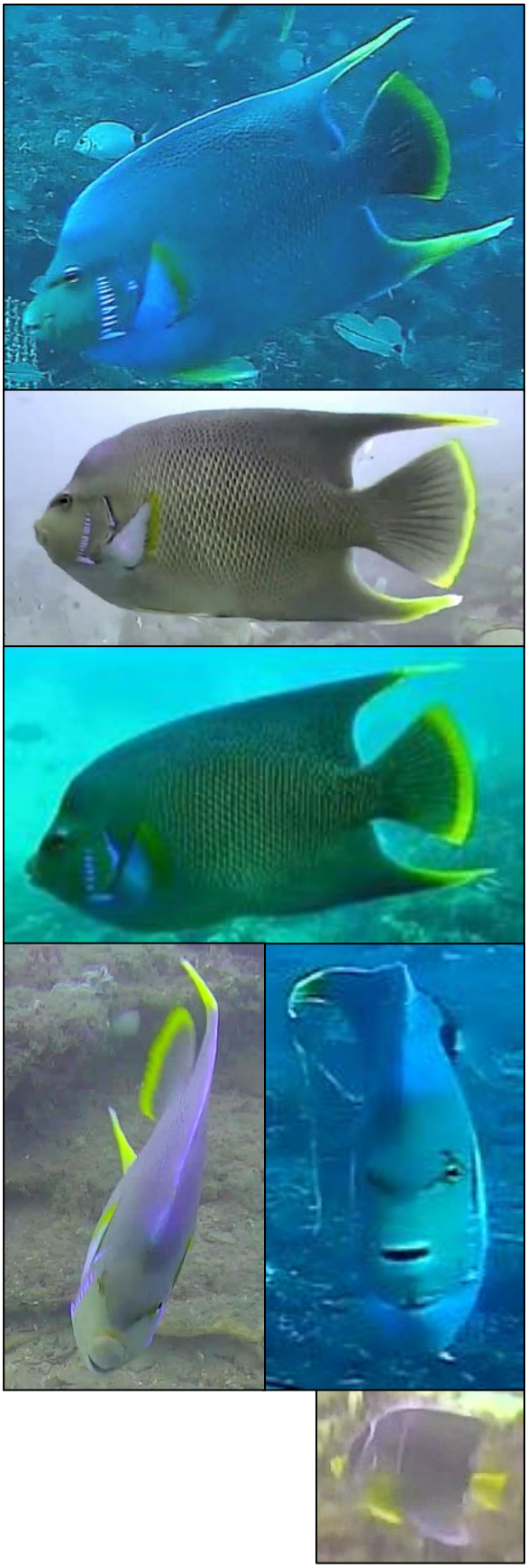
Angelfishes–Pomacanthidae
- Blue Angelfish
- French Angelfish
- Gray Angelfish
- Queen Angelfish
- Rock Beauty

Damselfishes–Pomacentridae
- Bicolor Damselfish
- Blue Chromis
- Cocoa Damselfish
- Purple Reeffish
- Sergeant Major

French angelfish *Pomacanthus paru* are frequently seen in pairs. Image credit: Explore.org/CamOp Pandafan-north

Blue Angelfish

***Holacanthus bermudensis* Goode, 1876**
Pomacanthidae



Distinguishing characteristics:
From the side, a broad body and trailing tips of its dorsal and anal fins give the blue angelfish a rectangular shape with a blunt face. The tail is rounded and the edge has a distinct yellow band. On the side of its face are several short, light blue lines called opercular spines which are arranged in a column. Body coloration ranges from gray, to powdery-blue, or yellow-green.

Juvenile blue angelfish are similar in coloration to adults, but young fish have three to four vertical blue to white bars on the body that fade as the fish matures. Typically the center bar is straight, or only slightly curved. The tail is often all-yellow.

From far away, the broad body, the trailing fin tips, and the yellow-edged tail make identification as a blue angelfish safe.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Queen Angelfish (*Holacanthus ciliaris*)

NOTE: Hybrids of blue and queen angelfishes are known from areas where both species overlap, as they do on SharkCam. This hybrid is commonly known as Townsend's angelfish "*Holacanthus townsendi*" or more correctly *Holacanthus bermudensis* X *H. ciliaris* hybrid.

The queen angelfish is nearly identical in shape to the blue angelfish but has a completely yellow tail and its bright blue forehead blotch has a darker center, making a ring (the "crown"). Blue angelfish have a tail color similar to their overall body color, but with a prominent yellow edge, and will either lack a blue forehead blotch, or if present it will be indistinct and lack a dark center. Overall, the queen angelfish tends to be more vibrantly colored than the blue angelfish.

A juvenile blue angelfish is easy to mistake for a juvenile queen angelfish, although the latter has not been definitively identified from SharkCam. Both have all-yellow tails, but the vertical bars of queen angelfish will be decidedly curved, while those of the blue are straight.

Queen Angelfish

***Holacanthus ciliaris* (Linnaeus, 1758)**
Pomacanthidae




Distinguishing characteristics:
From the side, trailing tips of its dorsal and anal fins give the queen angelfish a rectangular shape. The entire tail is yellow. Face-on, the fish has a roughly circular forehead blotch that is brighter blue than the surrounding area. The blotch has a darker center, making a ring (the queen's "crown"). On the side of its face are several short, light blue lines called opercular spines which are arranged in a column.

From far away, the broad body, the trailing fin tips, and the all-yellow tail make identification as a queen angelfish safe.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Blue Angelfish (*Holacanthus bermudensis*)

NOTE: Hybrids of blue and queen angelfishes are known from areas where both species overlap, as they do on SharkCam. This hybrid is commonly known as Townsend's angelfish "*Holacanthus townsendi*" or more correctly *Holacanthus bermudensis* X *H. ciliaris* hybrid.

The blue angelfish is nearly identical in shape to the queen angelfish but only the rear edge of the tail is yellow and its forehead often lacks a blue blotch or will have no darker center (no "crown"). Overall, the blue angelfish tends to be more muted in color than the queen angelfish.

A juvenile blue angelfish is easy to mistake for a juvenile queen angelfish, although the latter has not been definitively identified from SharkCam. Both have all-yellow tails, but the vertical bars of queen angelfish will be decidedly curved, while those of the blue are straight.

Rock Beauty

***Holacanthus tricolor* (Bloch, 1795)**
Pomacanthidae

Distinguishing characteristics:
The rock beauty shares with other angelfishes a rectangular body with a rounded, small face. It is deep-bodied and narrow. Its colors and pattern are distinctive among SharkCam fishes. The forward ⅓ of the body, including the head, is all yellow while the rear ⅔ of the body is marked with a large black square outlined with yellow. There is an all-yellow caudal fin. A close approach to the camera may reveal an iridescent blue eye.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Queen Angelfish (*Holacanthus ciliaris*), French Angelfish (*Pomacanthus paru*)

The rock beauty shares the angelfish family Pomacanthidae characteristics of a deep-body and narrow profile. Its all-yellow tail may be mistaken for a queen angelfish far from the camera, but queen angelfish lack black on the body. The French angelfish body is black and yellow, but black is the dominant color and only scales and other highlights are yellow.

French Angelfish

***Pomacanthus paru* (Bloch, 1787)**
Pomacanthidae





Distinguishing characteristics:
From the side, the erect dorsal and anal fins and their trailing tips give the French angelfish a spade shape (almost triangular). Except for its face, the scales on its body are dark with bright yellow edges, giving a speckled appearance. The face is gray or dark with a yellow ring around the eye and white lips.

Juvenile French angelfish are shaped similarly to adults, but scales outlined in yellow are not apparent. Instead, the juvenile has a series of vertical yellow bars that appear to begin across the lips, with the next bar behind the eye, and two or three additional ones that become progressively more curved as you move from front to back. Vertical bars are completely absent in the adult.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Gray Angelfish (*Pomacanthus arcuatus*), Blue Angelfish (*Holacanthus bermudensis*), Queen Angelfish (*Holacanthus ciliaris*), Atlantic Spadefish (*Chaetodipterus faber*)

The French and gray angelfishes possess nearly identical body shapes and may not be distinguishable from a distance. The most apparent difference between them is their color, with the gray angelfish's uniformly lighter gray scheme, as opposed to the French angelfish being black with yellow accents. From a distance, the gray angelfish appears lighter-colored with dark spots and a dark ring around the eye; the French angelfish appears dark with bright yellow crescents along its side and a yellow ring around the eye. The gray angelfish has yellow coloration on the backs of the pectoral fins only, while the French angelfish has a yellow spot on the front side of its pectoral fin. The caudal fin (tail) of the gray angelfish is sharply square, while the French angelfish's tail has a rounded edge.

Blue angelfish and queen angelfish have shapes roughly like the French angelfish, but are typically more rectangular. Blue coloration will always be seen on both the blue and queen angelfishes, and is absent in the French angelfish. Additionally, the French angelfish rarely has yellow on its tail, but this will always be seen in blue and queen angelfishes.

The Atlantic spadefish has a similar spade shape but is silvery-gray with contrasting black bars and has no yellow coloration. The dorsal and anal fin tips form a diverging angle on the Atlantic spadefish, while the fin tips on the gray angelfish bend slightly inward, or are nearly parallel.

Gray Angelfish

***Pomacanthus arcuatus* (Linnaeus, 1758)**
Pomacanthidae

Distinguishing characteristics:
From the side, the erect dorsal and anal fins and their trailing tips give the gray angelfish a spade shape (almost triangular). Except for its face, the scales on its body are dark gray to black against a lighter background, giving a speckled appearance. The face is lighter gray with a dark ring around the eye and white lips. Yellow coloration is absent on the body with the exception of the back of the pectoral fins. Flashes of yellow may be seen as this fish primarily uses these fins, instead of the tail, for swimming.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: French Angelfish (*Pomacanthus paru*), Blue Angelfish (*Holacanthus bermudensis*), Queen Angelfish (*Holacanthus ciliaris*), Atlantic Spadefish (*Chaetodipterus faber*)

The gray and French angelfishes possess nearly identical body shapes and may not be distinguishable from a distance. The most apparent difference between them is their color, with the French angelfish being black with yellow accents, as opposed to the gray angelfish's uniformly lighter gray scheme. From a distance, the French angelfish appears dark with bright yellow crescents along its side and a yellow ring around the eye; the gray angelfish appears lighter-colored with dark spots and a dark ring around the eye. The French angelfish has a yellow spot on the front side of its pectoral fin, while the gray angelfish instead has yellow coloration on the back of this fin only. The French angelfish's caudal (tail) fin has a rounded edge, while the tail of the gray angelfish is sharply square.

Blue angelfish and queen angelfish have shapes roughly like the gray angelfish, but are typically more rectangular. Blue coloration will always be seen on both the blue and queen angelfishes, and is absent in the gray angelfish. Additionally, the gray angelfish has no yellow on its tail.

The Atlantic spadefish has a similar spade shape but is silvery-gray with contrasting black bars and has no yellow coloration. The dorsal and anal fin tips form a diverging angle on the Atlantic spadefish, while the fin tips on the gray angelfish are nearly parallel, or bend slightly inward.

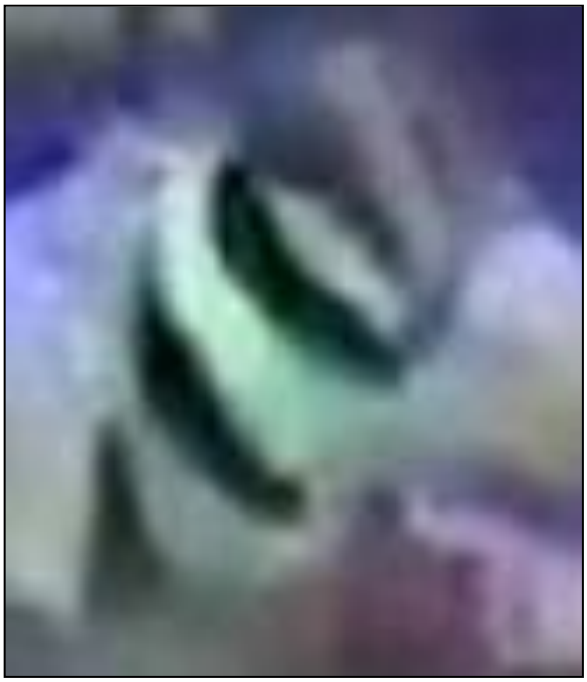
Banded Butterflyfish

***Chaetodon striatus* Linnaeus, 1758**
Chaetodontidae

Distinguishing characteristics:
From the side, banded butterflyfish have a relatively round body. Black and white alternating bars cover the entire body and extend onto the fins. No close approach by a banded butterflyfish has been documented, but even at a distance, the body pattern is readily apparent.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: No other fish seen on SharkCam resembles the banded butterflyfish.



Reef Butterflyfish

***Chaetodon sedentarius* Poey, 1860**
Chaetodontidae

Distinguishing characteristics:
From the side, reef butterflyfish have relatively round, white- or cream-colored bodies with pale yellow fins. They possess a thick black bar running over each eye, as well as a wider black and brown bar across the base of the tail which extends and fades into portions of the dorsal and anal fins.

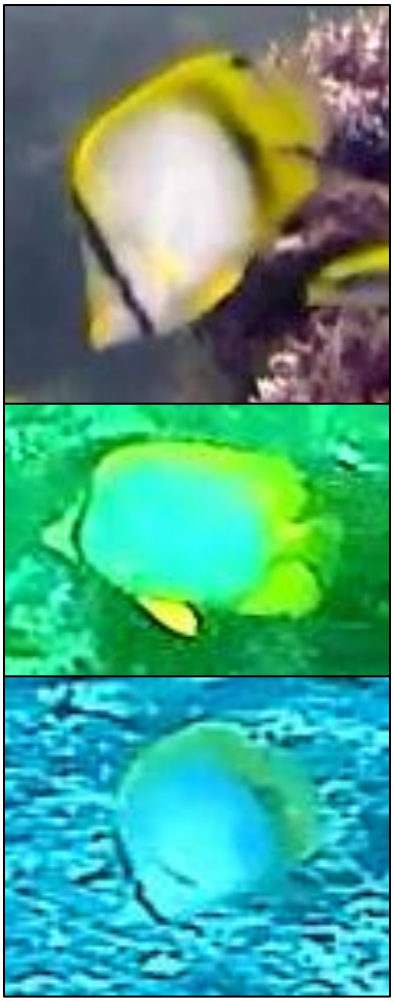
Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Spotfin Butterflyfish (*Chaetodon ocellatus*)

Both the reef butterflyfish and spotfin butterflyfish possess pale bodies with a black bar over the eye and yellow fins. The main distinguishing characteristic is the black-brown bar over the caudal peduncle of the reef butterflyfish, which is typically absent from the spotfin butterflyfish. The extension of the bar into the dorsal and anal fins can also give these fins a grayish-brown tint, and the fins themselves are fairly pale, as opposed to the uniformly bright yellow fins of the spotfin butterflyfish.

Spotfin Butterflyfish

***Chaetodon ocellatus* Bloch, 1787**
Chaetodontidae



Distinguishing characteristics:
From the side, spotfin butterflyfish have relatively round, white and yellow bodies, distinctly yellow fins, and a black bar that runs across the eye. The spot for which it is named is located at the trailing edge of its dorsal fin but is small and visible only upon close approach to the camera.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Reef Butterflyfish (*Chaetodon sedentarius*)

Both the spotfin butterflyfish and reef butterflyfish possess pale bodies with a black bar over the eye and yellow fins. The main distinguishing characteristics are that the eponymous spot of the spotfin is absent is in the reef butterflyfish. The black-brown bar over the caudal peduncle of the reef butterflyfish is typically absent from the spotfin butterflyfish. The extension of the bar into the dorsal and anal fins can also give these fins a grayish-brown tint. The fins themselves are fairly pale, as opposed to the uniformly bright yellow fins of the spotfin butterflyfish which also distinguishes it from the pale yellow or white fins of the reef butterflyfish.

Blue Chromis

***Chromis cyanea* (Poey, 1860)**
Pomacentridae

Distinguishing characteristics:
The blue chromis is brilliant blue with a deeply forked tail that has dark borders on the top and bottom. The body shape is a slender (elongated) oval. Like other damselfish, the blue chromis is a very active swimmer, constantly darting about.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Juvenile Purple Reeffish (*Chromis scotti*)

Juvenile purple reeffish are difficult to distinguish from blue chromis. Both are brilliant blue, although a side-by-side comparison will reveal that juvenile purple reeffish are more purple-blue than a true blue. The blue chromis has dark borders on its tail edges. The juvenile purple reeffish can have dark edges on its tail, although sometimes this can be difficult to see. The main distinguishing characteristic is the tail shape; the blue chromis tail is deeply forked, while the purple reeffish tail is only shallowly forked. The absence of dark tail edges, or the presence of a shallowly forked tail, signifies a juvenile purple reeffish. As they grow, the juvenile purple reeffish becomes deeper bodied than the blue chromis, more round than oval, and eventually they darken like adult purple reeffish.

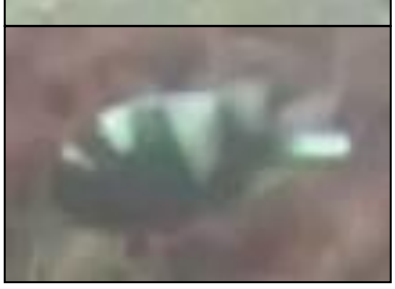
Purple Reeffish

***Chromis scotti* Emery, 1968**
Pomacentridae

Distinguishing characteristics:
SharkCam adult purple reeffish is a deep purple, almost black colored fish with an oval shape and a forked tail with rounded lobes. The chin and throat areas are lighter and a light blue line above the mouth forms a "mustache." The fish swims using primarily its pectoral fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. The fish feed in loose aggregations in the water column, seemingly in constant motion, darting about like other members of the damselfish family.

The juvenile purple reeffish are much more brilliantly colored bluish-purple fish that stay close to the bottom and show the same seemingly constant, quick motion as the adults. They are typically seen in small groups.

Rarely, an adult male purple reeffish has been seen with light bars and a light tail. This is a territorial display pattern as seen in this video.



Adult phase (top two images), adult and juvenile together (3rd image); juvenile (4th); territorial male (bottom)

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Cocoa Damselfish (*Stegastes xanthurus*), Blue Chromis (*Chromis cyanea*)

The cocoa damselfish is another dark damselfish having a forked tail with rounded lobes. Like the purple reeffish and other damselfishes, the cocoa damselfish seems to be in constant motion. However, unlike the purple reeffish's oval shape, the cocoa damselfish's large dorsal and anal fins give it a slightly rectangular shape. Other differences are the cocoa damselfish's use of its tail fin while swimming, and feeding primarily on algae-bearing substrates (i.e., not in the water column). Finally, under good lighting conditions, the cocoa damselfish coloration shows as a deep brown with yellow pectoral fins and a yellow wash in the chest area.

Blue chromis are difficult to distinguish from juvenile purple reeffish. Both are brilliant blue. The blue chromis has dark borders on its tail edges. The juvenile purple reeffish can have dark edges on its tail, although sometimes this can be difficult to see. The main distinguishing characteristic is the tail shape; the blue chromis tail is deeply forked, while the purple reeffish tail is only shallowly forked. The absence of dark tail edges, or the presence of a shallowly forked tail, signifies a juvenile purple reeffish. As they grow, the juvenile purple reeffish becomes deeper bodied than the blue chromis, more round than oval, and eventually they darken like adult purple reeffish.

Bicolor Damselfish

***Stegastes partitus* (Poey, 1868)**
Pomacentridae

Distinguishing characteristics:
From the side, dorsal and anal fins give the bicolor damselfish a somewhat rectangular shape. On SharkCam, overall color pattern and tone is highly variable, but generally the forward half of the body is dark and the back half is light. The tail may be all white, or darker than the back half of the body, or even darker than the front half, giving a tricolor or barred appearance. Smaller individuals and juveniles tend to have more clear demarcations in color transition, while on larger adults, color tones are more washed out. Younger fish often have an orange-yellow breast or belly area that may include the pectoral fins.

Both age groups spend most of their time at the bottom. Like other damselfish, bicolor damselfish seem to be constantly moving and are aggressive about chasing even larger fish away from a favorite grazing area.

NOTE: Damselfish species are very similar in silhouette, with a rounded body profile and often dark coloration in shades of brown, black, yellow, blue, or some combination.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Cocoa Damselfish (*Stegastes xanthurus*)

Cocoa and bicolor damselfish have similar shapes, are similarly sized, and both spend much of their time at the bottom. On SharkCam, the two species often interact with one another, chasing and interacting aggressively. Cocoa damselfish tend to be slightly larger and, so, tend to be the ones doing the chasing most often. Cocoa damselfish are more uniformly dark colored than bicolor damselfish, with some yellow showing in the chest area and on the pectoral and pelvic fins.

Cocoa Damselfish

***Stegastes xanthurus* (Poey, 1860)**
Pomacentridae

Distinguishing characteristics:
From the side, dorsal and anal fins give the cocoa damselfish a somewhat rectangular shape. At a distance, the fish looks dark with a hint of yellow towards the lower front. When closer, more yellow is visible together with narrow dark bars. The pectoral and pelvic fins are yellow. A very close approach or excellent visibility will reveal an iridescent blue edge to the anal and caudal fin margins.

The juvenile cocoa damselfish is seen occasionally, especially during warmer months. These tiny fish (<6 cm or 2 in) are purple across the dorsal region and the rest of the body is bright yellow. A black spot may be visible on the caudal peduncle in good light.

Like other damselfish, cocoas seem to be constantly moving and are aggressive about chasing even larger fish away from a favorite grazing area.

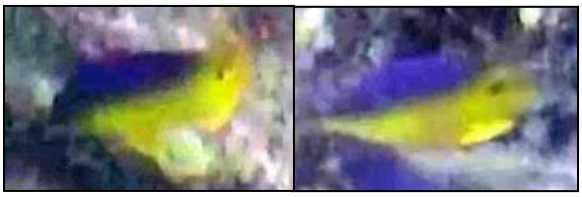
NOTE: See the Additional Information entry for additional information about a taxonomic change from *Stegastes variabilis* to *S. xanthurus* for the cocoa damselfish.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Bicolor Damselfish (*Stegastes partitus*)

Several species of benthic (bottom-dwelling) damselfishes are common at Frying Pan Tower, as seen by divers. On SharkCam, they are seen at a distance too great to allow positive identification. Additionally, juveniles of benthic damselfishes are often visually distinct from adults, further complicating identification.

Cocoa and bicolor damselfish have similar shapes, are similarly sized, and both spend much of their time at the bottom. On SharkCam, the two species often interact by chasing each other. Cocoa damselfish tend to be slightly larger and, so, tend to be the ones doing the chasing most often. Cocoa damselfish are more uniformly dark colored than bicolor damselfish, with some yellow showing in the chest area and on the pectoral and pelvic fins.



Adult phase (top 4 images), juvenile (bottom and left)

Sergeant Major

***Abudefduf saxatilis* (Linnaeus, 1758)**
Pomacentridae

Distinguishing characteristics:
From the side, a sergeant major is oval shaped. It has a gray head, a lighter colored body that almost always has a yellow cast, and five dark bars. The bars extend onto the dorsal fin. The highest part of its back is roughly above the center of the fish's body, behind its pectoral fin. Like other damselfish, sergeant majors seem to be constantly moving quickly, always busy.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Sheepshead (*Archosargus probatocephalus*), juvenile Banded Rudderfish (*Seriola zonata*), Atlantic Spadefish (*Chaetodipterus faber*)

Individuals of these similar species will always be many times larger than a sergeant major.

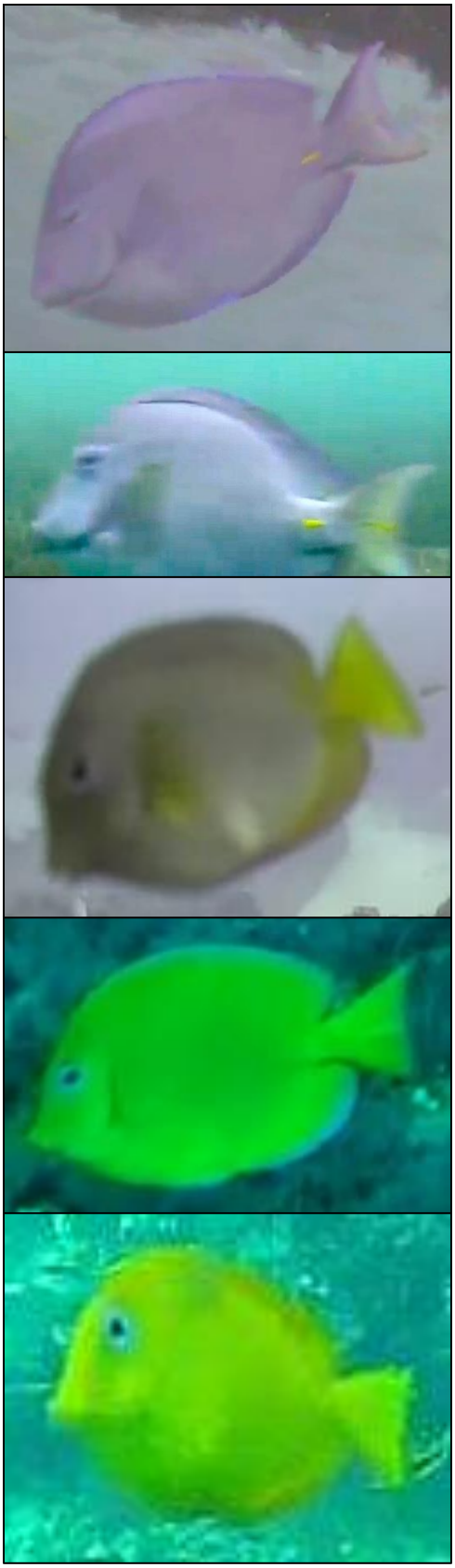
A sheepshead also has a gray head, a lighter colored body, and dark bars. However, it never looks yellow, it usually has six or seven bars, the high point of its back is roughly over its pectoral fin, and it acts more sedate than the busy sergeant major.

A juvenile banded rudderfish also has dark bars on a lighter colored body but the body is more elongated (not as deep) and does not have a darker head. Unlike the sergeant major, it has a dark bar, called a nuchal mark, which runs from the mouth, across the eye, to the front of the dorsal fin.

An Atlantic spadefish has dark bars on a lighter colored body but has an unmistakable triangular shape.

Blue Tang

***Acanthurus coeruleus* Bloch and Schneider, 1801**
Acanthuridae



Distinguishing characteristics:
The blue tang swims using primarily its pectoral fins, with little or no tail movement. The swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely because they are small and move rapidly. The body is oval, almost round, with a small, protruding snout and mouth.

An adult blue tang can vary its fin and body color tone from a light, almost white, powder blue, through various darker shades of blue. In individuals transitioning from juvenile to adult, the tail may retain some yellow.

Depending on proximity to the camera and lighting, the adult blue tang shows a single, short, light-colored, white to yellow line on the side of the base of its tail. The mark is a spur, and is the only failsafe way to identify an adult blue tang on SharkCam.

The juvenile blue tang is all yellow. As it transitions to an adult, it can be a mixture of yellow and darker, typically blue colors, with the tail the last to darken. Young juveniles stay close to the bottom and are visible as small, yellow, darting fish. As they get larger, they venture higher up the water column to SharkCam level.

Occasionally on SharkCam, oval-shaped dark fish are seen swimming using primarily their pectoral fins, usually in small groups of 3–6. Some of these might be adult blue tangs but identification as such is difficult without evidence for a light colored spur, and because other members of the family Acanthuridae (surgeonfishes) are similarly shaped, exhibit the same swimming style, and can be darkly colored.

Relative frequency: Juveniles–● ● ● ● Frequent–seen in 50% to 20% of visits; Adults–● Rare–seen in less than 1% of visits
Relative size: Juvenile–○ ○ Very small (<10 cm or 4 in) to Small (10–20 cm or 4–8 in); Adult–○ ○ Small (10–20 cm or 4–8 in)

Similar species: Doctorfish (*Acanthurus chirurgus*), Ocean Surgeon (*Acanthurus tractus*), see Surgeonfishes (*Acanthurus* spp.)

Because of its bright yellow color and round body, no other fish seen on SharkCam resembles a juvenile blue tang. See the Surgeonfishes profile for discussion of similarities between the adult blue tang, doctorfish, and ocean surgeon.

Doctorfish

***Acanthurus chirurgus* (Bloch, 1787)**
Acanthuridae

Distinguishing characteristics:
The doctorfish swims using primarily its pectoral fins, with little or no tail movement. From the side, its body is oval, almost egg-shaped, and typical of all three species of SharkCam surgeonfishes. The tail fin is nearly straight or slightly concave with blunt tips.

It has 10 to 12 dark bars on its side, and two, short, light colored lines, separated by a dark line (a spur), on the side of the base of its tail. On SharkCam, doctorfish have shown light blue to dark brown bodies, the two light colored lines, and, in good lighting, darker brown bars and blue highlights in the fins and tail. Rarely a faint lighter area will encircle the body just forward of the tail.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Adult Blue Tang (*Acanthurus coeruleus*), Ocean Surgeon (*Acanthurus tractus*), see Surgeonfishes (*Acanthurus* spp.)

See the Surgeonfishes profile for discussion of similarities between the adult blue tang, doctorfish, and ocean surgeon.

Ocean Surgeon

***Acanthurus tractus* Poey, 1860**
Acanthuridae

Distinguishing characteristics:
The ocean surgeon swims using primarily its pectoral fins, with little or no tail movement. From the side, its body is oval, almost egg-shaped, and typical of all three species of SharkCam surgeonfishes. The tail fin is concave with pointed tips.

A light-colored band is typical around the base of the tail. This is not a failsafe identifier to separate surgeonfishes, however. The pectoral and pelvic fins are darker than other surgeonfishes. In good light and close to the camera, ocean surgeons have two, short, light colored lines, separated by a dark line (a spur), on the side of the base of its tail. On SharkCam, ocean surgeons are variable in color and tone, with shades of brown and blue, varying from light to dark.

NOTE: Reference books and online resources have historically used the scientific name *Acanthurus bahianus* for the entire geographic range of the ocean surgeon. It was recently proposed that the northwestern Atlantic *A. bahianus* is actually *A. tractus* (ocean surgeon), and that *A. bahianus* (ocean surgeonfish) be reserved for the Brazilian population. See Additional Information for more detail.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Adult Blue Tang (*Acanthurus coeruleus*), Doctorfish (*Acanthurus chirurgus*), see Surgeonfishes (*Acanthurus* spp.)

A light-colored band around the base of the tail is common in ocean surgeons, but the other two species can also show this marker. See the Surgeonfishes profile for discussion of similarities between the adult blue tang, doctorfish, and ocean surgeon.

Surgeonfishes (Blue Tang, Doctorfish, Ocean Surgeon)

***Acanthurus coeruleus* Bloch and Schneider, 1801**
***Acanthurus chirurgus* (Bloch, 1787)**
***Acanthurus tractus* Poey, 1860**
Acanthuridae

Distinguishing characteristics:
Occasionally on SharkCam, oval-shaped, dark fish are seen, usually in small groups of 3–6. Coloration is typically dark, with or without a tinge of deep blue, or a dark brown. They swim using primarily their pectoral fins. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. The fish are adult blue tang, doctorfish, or ocean surgeons, and are collectively referred to as surgeonfish. The three species are difficult to distinguish when dark colored and complicate identification by sometimes schooling together.

Each species has a small (0.5 in or 1 cm), sharp spine, called a spur, on each side of its tail that it can erect like a thorn as a defense mechanism. The spur color is a distinguishing characteristic. The spur on a blue tang is a short white to yellow horizontal line on the base of the tail and is the key distinguishing characteristic for the adult of the species (see the species profile for blue tang). There have been few confirmed sightings of adult blue tangs on SharkCam.

Spurs on the doctorfish and ocean surgeon are dark-colored and can have short white lines above and below the spurs. Doctorfish are distinguished from ocean surgeonfish by their 10 – 12 dark bars on their sides (see the species profile for doctorfish). Because dark bars are difficult to see on a dark body, an inability to see bars cannot be a safe distinguishing characteristic. An apparent absence of the bars can mean the fish is an ocean surgeonfish or is a doctorfish but the bars cannot be seen.

The ocean surgeon is more brownish blue to gray than the typical blue tang (powder blue) or doctorfish (blue-gray), but all three species change color and frequently darken. Of the three, the ocean surgeon is more likely to have a light colored band around the base of the tail (see the species profile for ocean surgeon), but the other two species may also show this characteristic, and the blue tang may additionally be seen with a blue body and a yellow tail that fades as the fish transitions from juvenile to adult colors.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Adult Blue Tang (*Acanthurus coeruleus*), Doctorfish (*Acanthurus chirurgus*), Ocean Surgeon (*Acanthurus tractus*)

See species descriptions and Distinguishing Characteristics above. No other fish seen on SharkCam have dark, oval-shaped bodies and swim using primarily their pectoral fins.

NOTE: Reference books and online resources have historically used the scientific name *Acanthurus bahianus* for the entire geographic range of the ocean surgeon. It was recently proposed that the northwestern Atlantic *A. bahianus* is actually *A. tractus*, and that *A. bahianus* be reserved for the Brazilian populations of the ocean surgeonfish. See Additional Information for more detail.

SWIM WITH PECTORAL FINS/OBVIOUS SCALES (14)

Wrasses–Labridae

- Bluehead
- Creole Wrasse
- Clown Wrasse
- Painted Wrasse
- Puddingwife
- Slippery Dick
- Spanish Hogfish
- Spotfin Hogfish
- Yellowhead Wrasse

Positive identification of SharkCam Wrasses

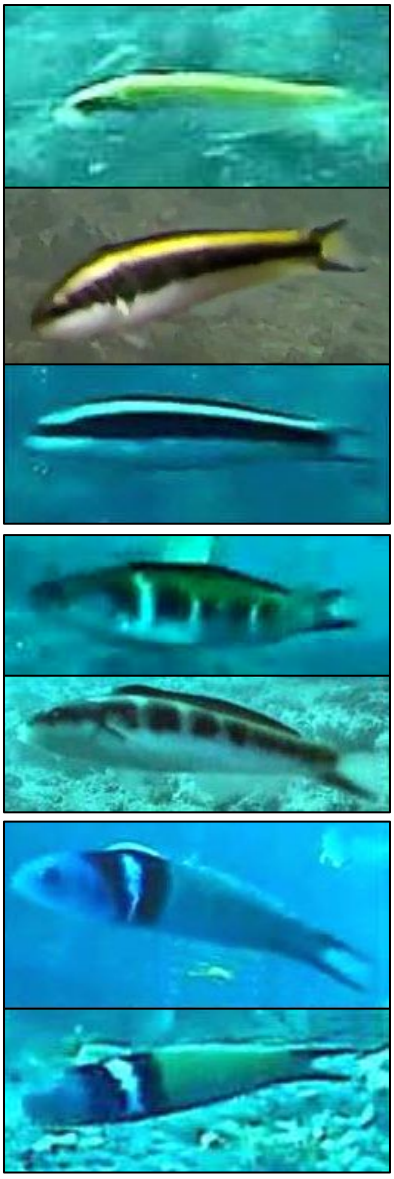
Parrotfishes–Scaridae

- Princess Parrotfish
- Redband Parrotfish
- Stoplight Parrotfish
- Striped Parrotfish
- Yellowtail Parrotfish

A Spanish hogfish *Bodianus rufus* cleans the pectoral fin of a sand tiger shark *Carcharias taurus*. Image credit: Explore.org/AlliCat93

Bluehead

Thalassoma bifasciatum **(Bloch, 1791)**
Labridae



Initial phase (top three images), intermediate stage (middle two), terminal phase (bottom two images)

Distinguishing characteristics:
Blueheads, like all wrasses, swim using primarily their pectoral fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Their tails are kept closed except when needed for a burst of speed. Like other wrasses, blueheads are small and slender, and change color patterns as they go through juvenile, initial, and terminal maturation phases. Blueheads in the same phase can exhibit different color variations, and intermediate stages between phases can greatly alter their appearance.

Behaviorally, blueheads are often seen in small groups with a terminal phase male and multiple initial phase individuals (sometimes of different variations). Blueheads are more likely than the other slender wrasses (clown, painted, puddingwife, slippery dick, and yellowhead) to venture above the bottom.

Initial phase: SharkCam initial phase blueheads show three color variations, all with a white belly. The "all-yellow variation" has a yellow head and back and black around the eye. The "mid-body-stripe variation with yellow back" looks like the "all-yellow variation" but with a dark stripe on the side. The "mid-body-stripe variation with white back" shows no yellow, just a wide dark stripe. The last variation is the most common bluehead seen on SharkCam.
Intermediate stage: As SharkCam initial phase blueheads transition to a terminal phase, they develop a series of alternating light and dark bars. The light-colored bars are white or greenish yellow; the dark-colored bars are black and may include lighter coloration above and below. The top and bottom edges of the tail are dark colored.
Terminal phase: The terminal phase bluehead has a blue head and a rear body that is blue, green, or blue-green. The head and rear body are separated by two dark bars, which are separated by a white bar. The top and bottom edges of the tail are dark colored.

Relative frequency:
All phases–● ● ● ● ● Common–seen often, greater than 50% of visits
Initial phase–
all-yellow variation; ● Rare–seen in less than 1% of visits
mid-body-stripe variation with yellow back; ● ● ● Occasional–seen in 10% to 20% of visits
mid-body-stripe variation with white back; ● ● ● ● ● Common–seen often, greater than 50% of visits
Intermediate stage– ● ● ● ● Frequent–seen in 50% to 20% of visits
Terminal phase– ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

No other fish seen on SharkCam resembles the terminal phase bluehead with its color and pattern.

Clown Wrasse

***Halichoeres maculipinna* (Müller and Troschel in Schomburgk, 1848)**
Labridae

Juvenile phase (top) initial phase variations (next two images), terminal phase variations (bottom two images)

Distinguishing characteristics:
Wrasses swim using primarily their pectoral fins, with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Clown wrasses seem to swim constantly, always going somewhere. Their bodies are small, 4 to 6 inches long, and slender as seen from the side. Like other wrasses, clown wrasses change color patterns as they go through juvenile, initial, and terminal maturation phases.

Juvenile/initial phase: SharkCam juvenile and initial phase clown wrasses are slim fish with a thin yellow stripe beginning on the crown of the head and tapering toward the tail. Below the yellow stripe is a much thicker black one, and the rest of the body below the mid-line is white. The distinction between the juvenile and initial phase is not clear, but more mature individuals will show more pattern and reddish-brown coloration on the head and fins. In good lighting three reddish-brown bars may be seen above the eye, on top of the head.
Terminal phase: SharkCam terminal phase clown wrasses are seen in two color variations, both having a black spot on the side. The typical variation looks like the initial phase (dark above, white below) but with the spot and a yellow chin. The other variation, called “nuptial colors,” has a white back, a moderate-toned stripe, a white underside, and the spot.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

No other fish seen on SharkCam resembles the terminal phase clown wrasse. With good lighting, the dark spot on the side of the terminal phase clown wrasse distinguishes it from the terminal phases of the other species.

Painted Wrasse

***Halichoeres caudalis* (Poey, 1860)**
Labridae

Distinguishing characteristics:
Painted wrasses are diminutive fish with cigar-shaped bodies. Their snout is strongly conically pointed. Painted wrasse spend most of their time close to the seafloor. Like all wrasses, they swim primarily using their pectoral fins with little to no tail movement; they appear to be constantly swimming or darting. Their dorsal surface appears brownish-red, while a yellow tint is present on the head and front of the abdomen. A single, bold white stripe runs along the side of the body. A very small black spot immediately behind the eye is present, rows of cyan dots along the body, but both are unlikely to be seen except upon a close approach.

Like other wrasses, painted wrasse change color patterns as they go through juvenile, initial, and terminal maturation phases. Only the juvenile/initial phase has been seen on SharkCam.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

Puddingwife

***Halichoeres radiatus* (Linnaeus, 1758)**
Labridae

Distinguishing characteristics:
The puddingwife, like all wrasses, swims using primarily its pectoral fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely.

Like other wrasses, puddingwife change color patterns as they go through juvenile, initial, and terminal maturation phases. Adult, initial, and juvenile phase puddingwife have been seen on SharkCam.

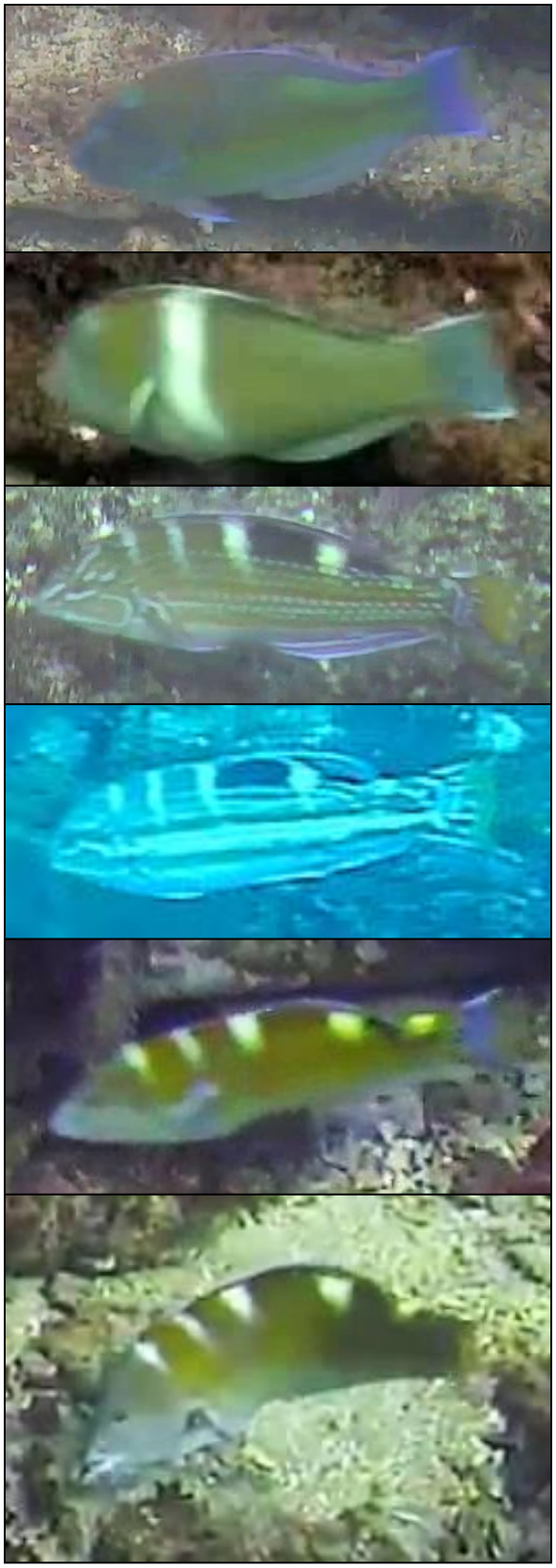
NOTE: Mixed species hunting behaviors have been described between puddingwife and bar jacks by Baird (1993). See https://youtu.be/r5nyBLmMJ2M for an example of this behavior.

Juvenile/initial phase: From the side the initial phase has a slender oval shape with five white bars across the back and black areas between two or three of the bars. The main body color is orange-brown, with areas of blue and green. Stripes may be present on the body and face or absent.
Terminal phase: The adult phase is deeper-bodied and does not show the distinct white bars across the dorsal surface. The main body colors are green and orange.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

No other fish seen on SharkCam resembles the terminal phase puddingwife.



Terminal phase variations (top two images); Initial phase (bottom four images); juvenile (left)

Slippery Dick

***Halichoeres bivittatus* (Bloch, 1791)**
Labridae

Distinguishing characteristics:
Slippery dicks, like all wrasses, swim using primarily their pectoral fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Slippery dicks seem to swim constantly, always going somewhere. Their bodies are small and, from the side, slender.

Like other wrasses, slippery dicks change color patterns as they go through juvenile, initial, and terminal maturation phases. SharkCam juvenile and initial phases typically have two dark stripes separated by a white stripe. The initial phase can also have numerous (10 or so) light bars, giving these individuals a blotched appearance. The terminal phase has not been confirmed from SharkCam.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

Yellowhead Wrasse

***Halichoeres garnoti* (Valenciennes in Cuvier and Valenciennes, 1839) Labridae**

Juvenile (top); initial phase (middle); terminal phase (bottom image)

Distinguishing characteristics:
Wrasses swim using primarily their pectoral fins, with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Yellowhead wrasses seem to swim constantly, always going somewhere. Seen from the side, their bodies are slender.

Like other wrasses, the yellowhead changes color patterns as it goes through juvenile, initial, and terminal maturation phases.

Juvenile phase: From the side the juvenile phase yellowhead wrasse is a slender and elongated fish. The body is all yellow-orange with a prominent white mid-body stripe. The crown of the head forward of the gills is a darker yellow-gray. Juvenile yellowhead wrasse are likely to only be identifiable upon a close approach or when the camera is zoomed on the bottom.
Initial phase: From the side the initial phase yellowhead wrasse is a slender and elongated fish. The body is all yellow-orange with a dusky portion above the mid-line on the head to less than half the body length. Initial phase yellowhead wrasse are likely to only be identifiable upon a close approach or when the camera is zoomed on the bottom.
Terminal phase: True to its name, the adult, terminal phase yellowhead has a yellow head. The rest of its body is white, partially framed by a black bar against the yellow, a black back, and a black tail. The contrast of yellow forward and black past the mid-body is recognizable from a distance.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: See Positive Identification of SharkCam Wrasses for a discussion of visually distinguishing characteristics of the juvenile phase (JP) and initial phase (IP) slender wrasses.

No other fish seen on SharkCam resembles the terminal phase yellowhead wrasse.

SharkCam Fishes

Positive Identification of SharkCam Wrasse Species

The wrasses (Family Labridae) are a diverse, circumglobal group of abundant and conspicuous fishes found associated with temperate and tropical reefs. Among SharkCam fishes, our wrasses range from the large and stocky hogfish (*Lachnolaimus maximus*) and tautog (*Tautoga onitis*), to active and colorful mid-water dwellers like creole wrasse (*Clepticus parrae*), Spanish hogfish (*Bodianus rufus*), and spotfin hogfish (*Bodianus pulchellus*). These species are readily distinguishable, but on SharkCam there are six species (so far) of small, slender wrasses often described as cigar-shaped. These wrasses are especially complicated to visually identify because, in addition to their small size and slender bodies, they all go through distinct changes in color, pattern, and sometimes shape through their lives. These changes are called "phases" and correspond to sex and reproductive strategy.

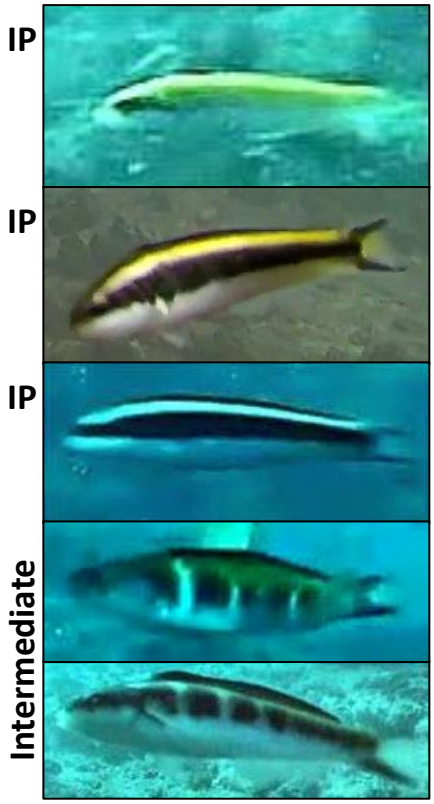
Our slender wrasse species are sequential protogynous hermaphrodites, a reproductive strategy characterized as "female-first." The phases are described as an immature (juvenile) phase (JP), an initial phase (IP) that includes sexually mature females (and in some species, mature males that retain IP characteristics), and a final, terminal phase (TP) that is only mature males. The terminal phases of the slender wrasses are visually distinct. See the individual species profiles for information on terminal phase identification.

The JP and IP of several SharkCam wrasse species can be difficult to positively identify due to their small size, continuous movement, and association with the bottom.

Color, pattern, and behavior can be used to differentiate them via process of elimination, however.

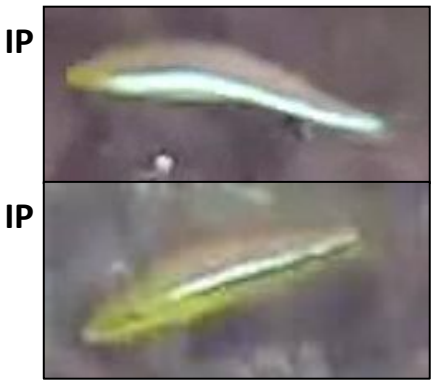
Clown Wrasse

Slippery Dick



Bluehead

Yellowhead Wrasse



Painted Wrasse

Puddingwife

Similar species: juvenile (JP) and initial phases (IP) of Bluehead (*Thalassoma bifasciatum*), Clown Wrasse (*Halichoeres maculipinna*), Painted Wrasse (*Halichoeres caudalis*), Puddingwife (*Halichoeres radiatus*), Slippery Dick (*Halichoeres bivittatus*), Yellowhead Wrasse (*Halichoeres garnoti*)

Among the six species of slender wrasses, puddingwife JP and IP are the simplest to separate from the other five species. From the side, puddingwife have a deeper body (less slender) than the JP or IP of other species. Except in the youngest JP individuals, puddingwife will typically have five white bars across the back and black areas dorsally between two or three of the bars. The bars are relatively evenly spaced starting behind the head and ending above the tail. Two other SharkCam slender wrasses may have bars: the intermediate stage of blueheads and a barred variation of the IP slippery dick. Bars on the slippery dick are indistinct and of variable number, while those on the intermediate bluehead are typically three in number and decrease in bar width towards the tail.

Yellow coloration is common on several species and phases of slender wrasses. The pattern of yellow, black, and white stripes can be used to distinguish among IP variations of bluehead, JP and IP of clown wrasse, and JP and IP yellowhead wrasse. First, yellowhead wrasse can be eliminated if the entire body is not yellow. In JP yellowheads, a bold white stripe, edged in black, separates a yellow dorsum (back), and yellow ventrum (belly). The IP yellowhead is all yellow. Both JP and IP yellowheads have a darker head, more green than yellow. No other slender wrasses are fully yellow. In the IP bluehead "all-yellow variation" the back is yellow with a lighter belly. A dark stripe crosses the eye, but the head is not otherwise darkened. Other "all yellow" wrasses do not have a dark stripe through the eye. The other IP blueheads have either yellow or white dorsally, a wide black mid-body stripe from the mouth to the tail, and a white ventrum. The painted wrasse has a yellow cast, especially ventrally and on the snout, but the dominant color dorsally is brown, and a bold, wide, white stripe, edged in black, extends from under the eye to the tail. The slippery dick IP is also brown, but may have vertical bars separating it from the painted wrasse, and often an orange belly stripe that the other slender wrasses lack. The slippery dick IP is also large than the other slender wrasses, except the puddingwife. The JP and IP clown wrasse have a thin margin dorsally of yellow, a thick mid-body stripe of black, and a thicker ventral stripe of white. Notable on the clown wrasse, a series of three reddish-brown bars are on the forehead behind the eye. Yellow stripes on the JP puddingwife should not confuse identification because other characteristics (deeper body, white and black bars) distinguish it.

Size and frequency patterns among the species are generally applicable and can also aid in identification.

Relative frequency: Frequent → Rare
● ● ● ● ● Bluehead > ● ● ● ● Slippery Dick > ● ● ● Clown Wrasse > ● ● Puddingwife > ● ● Yellowhead Wrasse > ● Painted Wrasse

Relative size: Large → Small (of typical IP individuals)
○ ○ Puddngwife > ○ ○ Slippery Dick > ○ ○ Clown Wrasse > ○ ○ Yellowhead Wrasse > ○ Painted Wrasse > ○ Bluehead

Behavior may also be useful as supporting information for separating SharkCam slender wrasses.

Blueheads are often seen in small groups with a terminal phase male and multiple initial phase individuals (sometimes of different variations). Blueheads are more likely than the other slender wrasses to venture above the bottom, although individuals and groups without a TP male are more bottom-associated.

Clown wrasse, puddingwife, slippery dick, and yellowhead wrasse are typically alone, or seen occasionally with one or two others. Painted wrasses have only been seen as individuals. All tend to stay near the bottom, with only the slippery dick rarely seen at or above the level of SharkCam.

There are other slender wrasses native to the SharkCam area that have not yet been identified on camera. These include greenband wrasse (*Halichoeres bathyphilus*), yellowcheek wrasse (*Halichoeres cyanocephalus*), and blackear wrasse (*Halichoeres poeyi*). If you apply these characteristics and still are unsure of your identification, feel free to post screenshots with a timecode of occurrence on the SharkCam forum and you will get input from others. You may be the first to identify a new species!

Creole Wrasse

***Clepticus parrae* (Bloch and Schneider, 1801)**
Labridae

Distinguishing characteristics:
Wrasses swim using primarily their pectoral fins, with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Creole wrasses seem to swim constantly, always going somewhere. They are normally seen in small groups of a few individuals. Creole wrasses have the elongated body shape typical of small-bodied wrasses, a symmetrically tapered head, and are slender from the side. The tail fin appears deeply forked.

On SharkCam, creole wrasse appear purplish-blue with lighter colored (white) lips and belly regions. A darker purple to blackish blotch on the face between the eyes extends onto the upper lip. In more mature individuals the anal and dorsal fins may appear dark and have yellow tips. Like other wrasses, the creole changes color patterns as it becomes more mature.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Blue Chromis (*Chromis cyanea*), juvenile Purple Reeffish (*Chromis scotti*)

Although the body shape and swimming style of the creole wrasse is clearly similar to other small-bodied wrasses, the bright purplish-blue coloration makes them unlikely to be confused for other wrasses.

Two other fishes on SharkCam, blue chromis and juvenile purple reeffish, share a blue to purplish overall coloration. Both are members of the damselfish family (Pomacentridae) and are noticeably deeper bodied, more rounded or oval fishes. Also, both blue chromis and juvenile purple reeffish may appear to have a forked tail, but each lobe of the tail in these damselfishes has a dark or black stripe along the outer margins. Both blue chromis and juvenile purple reeffish are quite a bit smaller than the typical creole wrasse, and so relative size along with the wrasse-like body and swimming style make identification as creole wrasse reasonably straightforward.

Spanish Hogfish

***Bodianus rufus* (Linnaeus, 1758)**
Labridae

Distinguishing characteristics:
Spanish hogfish, like all wrasses, swim using primarily their pectoral fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. Spanish hogfish change patterns as they go through juvenile, initial, and terminal maturation phases. They start with a bright yellow body except for a dark "cape" covering their upper body from the nose almost to the end of the dorsal fin. As they age, the yellow coloration gives way to dark gray-purple, until the mature terminal phase is almost all dark with little yellow remaining. The body shape remains generally the same as they age, with a pointed snout and long tips of the dorsal and anal fins that give the fish an almost rectangular shape. The tail fin margin is often irregular or ragged.

NOTE: Smaller individuals often engage in cleaning behavior with larger, often predatory, fishes.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Spotfin Hogfish (*Bodianus pulchellus*)

The spotfin hogfish and the Spanish hogfish have the same body shape and similar combinations of dark and yellow coloration. Only the spotfin shows white as a stripe from the chin towards the tail.

Juvenile (top), initial phase female (second), and terminal phase male (bottom two images) coloration of the Spanish hogfish. Larger (male) individuals generally have less yellow.

Spotfin Hogfish

***Bodianus pulchellus* (Poey, 1860)**
Labridae

Distinguishing characteristics:
Spotfin hogfish, like all wrasses, swim using primarily their pectoral fins with little or no tail movement. They have a pointed snout and long tips on the dorsal and anal fins that give the fish an almost rectangular shape. Also like other wrasses, spotfin hogfish change color patterns as they go through juvenile, initial, and terminal maturation phases. Only the terminal phase has been seen on SharkCam.

The terminal phase spotfin hogfish seen on SharkCam has a dark body with a white stripe that starts wide at the chin and narrows towards the tail. The end of the dorsal fin, upper part of the tail base, and the tail are bright yellow. The fish may have a white stripe that runs from the mouth, up the nape, and across the back.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Spanish Hogfish (*Bodianus rufus*)

The Spanish hogfish and the spotfin hogfish have the same body shape and similar combinations of dark and yellow coloration. The Spanish hogfish shows no white, as the spotfin does in its stripe from the chin towards the tail.

Redband Parrotfish

***Sparisoma aurofrenatum* (Valenciennes in Cuvier and Valenciennes, 1840) Scaridae**

Juvenile (top); Initial phase (second image); Terminal phase variations (bottom two images)

Distinguishing characteristics:
Parrotfish swim primarily using their pectoral fins with little tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. From the side they are oval shaped. Parrotfish change color patterns as they go through juvenile, initial, and terminal maturation phases.

Juvenile: Young redband parrotfish appear dark brown to green with two thin white stripes. The higher stripe begins above the eye and reaches the rear of the dorsal fin, while the lower stripe begins at the mouth and follows the mid-line. In good light, three dark spots may be seen on the light-colored anal fin. A white spot is always visible behind the dorsal fin just forward of the tail.

Initial phase: Initial phase redband parrotfish look mottled with dark and lighter tones of gray-green and no white stripes. A white spot is always visible behind the dorsal fin just forward of the tail.

Terminal phase: Redbands on SharkCam show little color or marking variation. They generally appear gray-green above the midline and yellowish-white below and around the base of the tail, masking the saddle. The tail is light colored with dark borders on the top, bottom, and end. A distinct line with darker tones above and lighter tones below begins as the corner of the mouth, passes under the eye, and terminates near the gill opening. In good light, the anal fin and tail borders will show hints of red.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Striped Parrotfish (*Scarus iseri*), Princess Parrotfish (*Scarus taeniopterus*), Stoplight Parrotfish (*Sparisoma viride*), Yellowtail Parrotfish (*Sparisoma rubripinne*)

Initial phases of other parrotfish species may be mistaken for the redband parrotfish. The yellowtail parrotfish is the only other species on SharkCam that shows a white saddle across the base of its tail. As its name implies, this species has a yellow tail, a feature redbands do not have. The stoplight parrotfish has a similar swimming style and silhouette but, unlike the redband parrotfish, has a white bar across the middle of its tail and three roughly horizontal rows of white spots on its body. Initial phase striped and princess parrotfishes share a striped appearance similar to the juvenile redband parrotfish but lack the white spot behind the dorsal fin.

Stoplight Parrotfish

***Sparisoma viride* (Bonnaterre, 1788)**
Scaridae

Distinguishing characteristics:
Parrotfish swim primarily using their pectoral fins with little tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. They are oval shaped from the side and change color patterns as they go through juvenile, initial, and terminal maturation phases.

On SharkCam, there has been no confirmed sighting of a terminal phase stoplight parrotfish.

Juvenile/initial phase: SharkCam juvenile and initial phase stoplight parrotfish are dark with a white bar across the middle of the tail and three roughly horizontal rows of white spots on the body. The spots are similar in size to the large scales. Depending on proximity and lighting, additional white spots may also show. The head is light yellow to green compared to the dark brown body. A close approach will show the eye is ringed in yellow.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits

Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: initial phase Redband Parrotfish (*Sparisoma aurofrenatum*), initial phase Yellowtail Parrotfish (*Sparisoma rubripinne*)

All parrotfish share similar silhouettes and swimming styles, but among SharkCam parrotfishes, only darkly mottled initial phase redband and the light-dark alternating scales of the initial phase yellowtail may be mistaken from a distance for the stoplight. Like the stoplight parrotfish, the yellowtail parrotfish has a white spot behind the dorsal fin just forward of the tail, but as its name says, it has an all-yellow tail which is a characteristic not shared by the stoplight parrotfish. The stoplight parrotfish's rows of white spots and white bar across the middle of its tail make identification relatively straightforward.

Yellowtail Parrotfish

***Sparisoma rubripinne* (Valenciennes in Cuvier and Valenciennes, 1840) Scaridae**

Distinguishing characteristics:
Parrotfish swim primarily using their pectoral fins with little tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. They are oval shaped from the side and change color patterns as they go through juvenile, initial, and terminal maturation phases. On SharkCam, there has been no confirmed sighting of a juvenile phase yellowtail parrotfish.

Initial phase: SharkCam initial phase yellowtail parrotfish are gray to pink with a squared off yellow tail. There is a white marking, called a "saddle," across the top of the base of the tail (the white saddle does not encircle the tail base), and there are three or four white spots along the top of the body, next to the dorsal fin. Close up, the large scales on the side show rows of alternating dark and light tones. Occasionally, a yellowtail shows a white stripe on its side.

Terminal phase: The terminal phase yellowtail parrotfish appears gray to dusky blue with a lighter face and head. There is a prominent light blotch along the mid-body. The tail is curved into a crescent and retains yellow color except at the edges.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Redband Parrotfish (*Sparisoma aurofrenatum*)

The redband parrotfish is the only other SharkCam species that shows a white saddle across the base of its tail. The redband does not have a yellow tail. Other SharkCam species have yellow tails but do not swim like a parrotfish.

Initial phase variations (top three images), terminal phase (bottom)

Princess Parrotfish

***Scarus taeniopterus* Desmarest in Bory de Saint-Vincent, 1831 Scaridae**

Distinguishing characteristics:
Parrotfish swim primarily using their pectoral fins with little tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. They are oval shaped from the side and change color patterns as they go through juvenile, initial, and terminal maturation phases.

On SharkCam, there has been no confirmed sighting of a juvenile or terminal phase princess parrotfish.

Initial phase: The body has three brownish-black stripes, two white stripes and a white belly. Near the camera, thin silver stripes may be visible on the belly. The borders of the tail will be dark. During the transition to initial phase, the body has a brownish color with dark stripes that are less distinct than the juvenile phase. During maturation, stripes fade and become brown while the fins may become yellowish. The borders of the tail will be dark.

Relative frequency: ● Rare–seen in less than 1% of visits

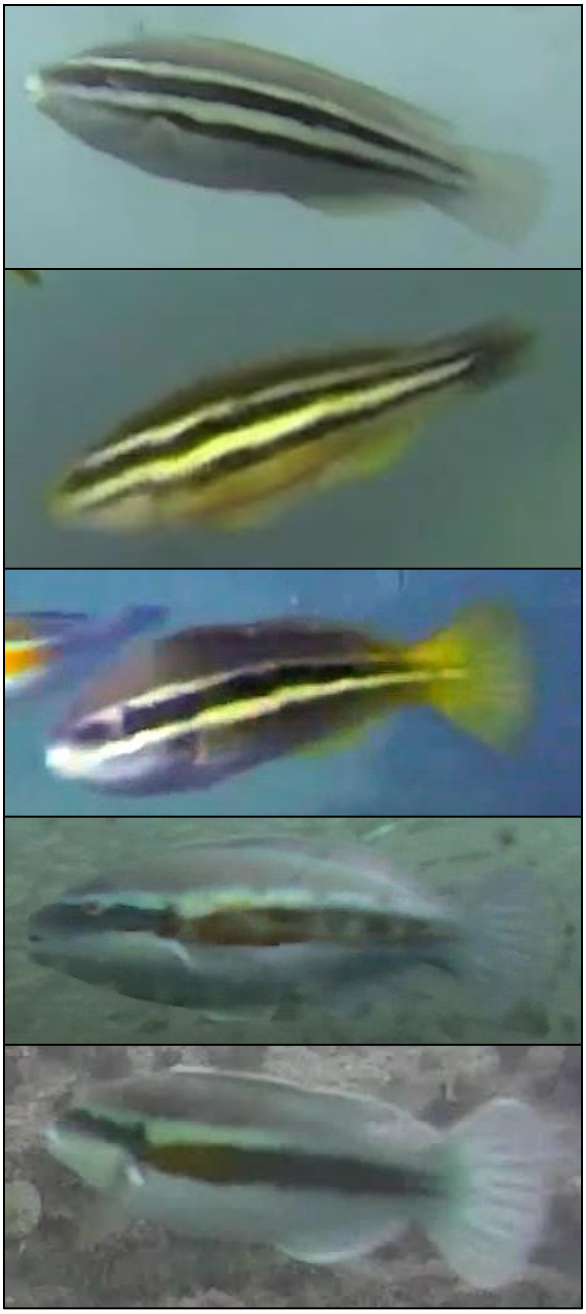
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: initial phase Striped Parrotfish (*Scarus iseri*), juvenile Redband Parrotfish (*Sparisoma aurofrenatum*)

The initial phase striped parrotfish is very similar to initial phase princess parrotfish. They are distinguished by the lack of dark borders on the tail fin of striped parrotfish, and will often have a yellow smudge on the nose. Generally, the fins and body will have a yellowish tint, relative to the "cleaner" dark brown and white of the initial phase princess parrotfish. Striped and princess parrotfishes of similar size often associate together in small groups. Late initial phase princess parrotfish stripes tend to fade and become less defined, similar to the initial phase redband parrotfish. Juvenile redband parrotfish will have a white spot visible just ahead of the tail and the light colored anal fin often shows dark spots.

Striped Parrotfish

***Scarus iseri* (Bloch, 1789)**
Scaridae



Initial phase variations (top three images), terminal phase variations (bottom two and left images)

Distinguishing characteristics:
Parrotfish swim primarily using their pectoral fins with little tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. They are oval shaped from the side and change color patterns as they go through juvenile, initial, and terminal maturation phases.

Juvenile/initial phase: The body has three brownish stripes, two white stripes and a white to yellow belly. Near the camera, thin, broken yellow to brown stripes may be visible on the belly. The borders of the tail will be clear. During the transition to initial phase, the body has a brownish color with dark stripes that are less distinct than the juvenile phase. A yellow smudge is often present on the nose and the body and fins may have a yellowish tint.

Terminal phase: Mature male striped parrotfish are green to blue with indistinct pink on the face and ventral body. They will typically have a mid-body yellow blotch, beginning at the pectoral fin and extending a short distance toward the tail. A black spot may be visible at the corner of the gill cover.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Princess Parrotfish (*Scarus taeniopterus*), juvenile Redband Parrotfish (*Sparisoma aurofrenatum*)

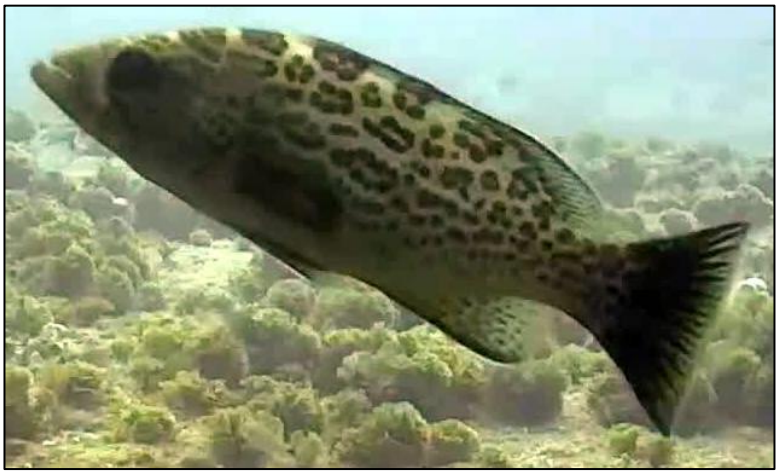
The initial phase princess parrotfish is very similar to initial phase striped parrotfish. They are distinguished by the dark borders on the tail fin of princess parrotfish. Striped and princess parrotfishes of similar size often associate together in small groups. Late initial phase striped parrotfish stripes tend to fade and become less defined, similar to the initial phase redband parrotfish. Juvenile redband parrotfish will have a white spot visible just ahead of the tail and the light colored anal fin often shows dark spots.

Heavy Bodies/Large Lips (11)

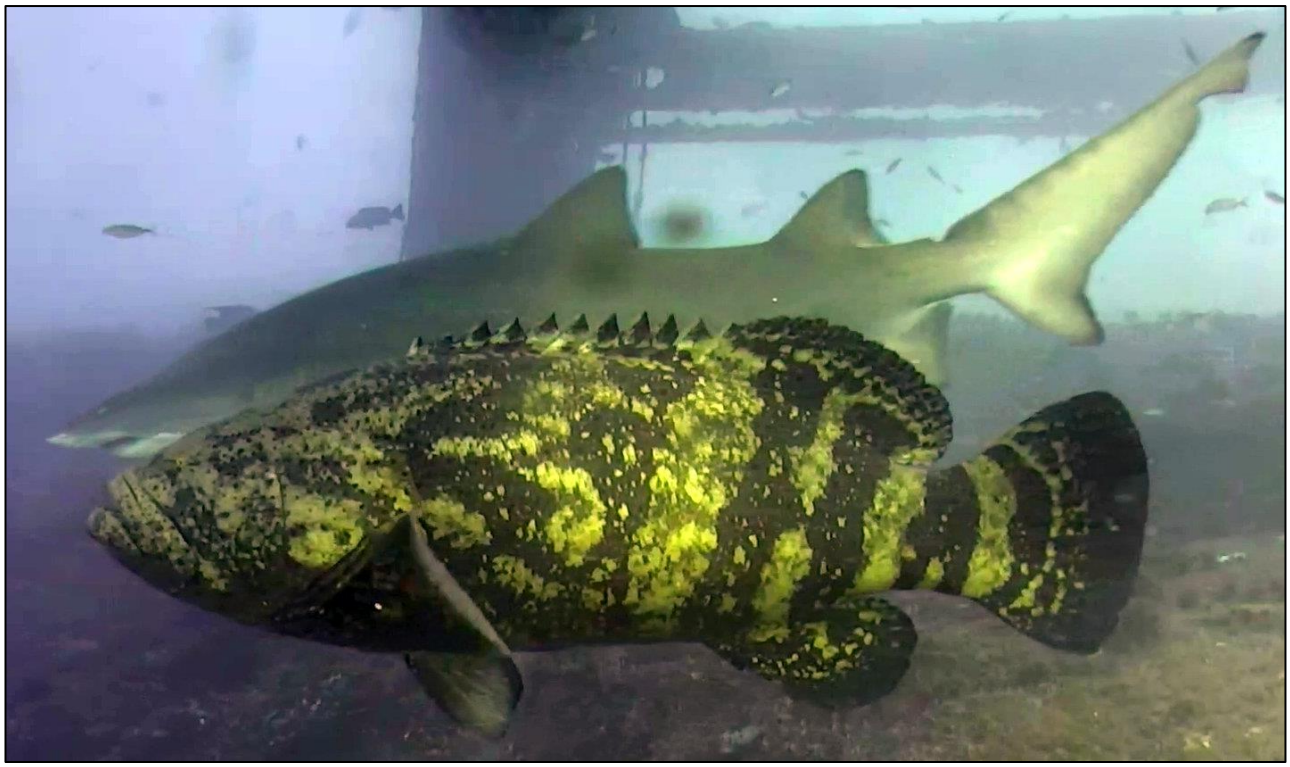
Sea Basses and Groupers–Serranidae
- Black Grouper
- Black Sea Bass
- Gag
- Greater Soapfish
- Goliath Grouper
- Graysby
- Scamp
- Whitespotted Soapfish

Wrasses–Labridae
- Hogfish
- Tautog

Cobia–Rachycentridae
- Cobia



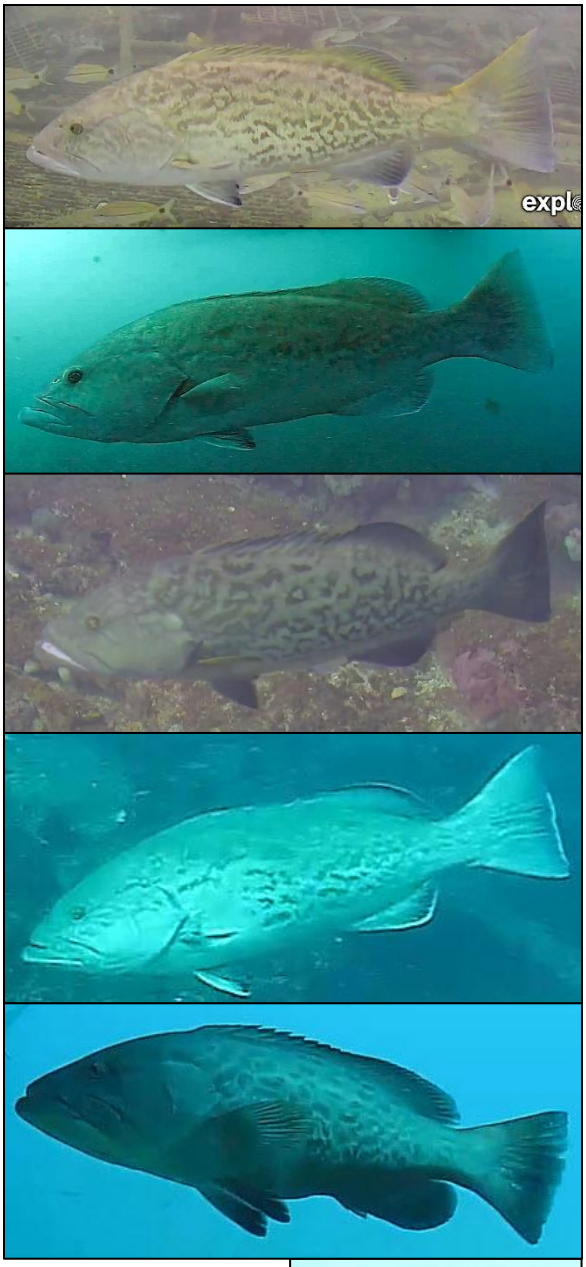
A young scamp *Mycteroperca phenax* shows off its cat's paw markings. Image credit: Explore.org/5girls



A goliath grouper *Epinephelus itajara* is the largest bony fish seen on SharkCam even rivaling the size of some sand tiger sharks *Carcharias taurus*. Image credit: Explore.org/CamOp Scout/Erin Burge

Gag

***Mycteroperca microlepis* (Goode and Bean, 1879)**
Serranidae



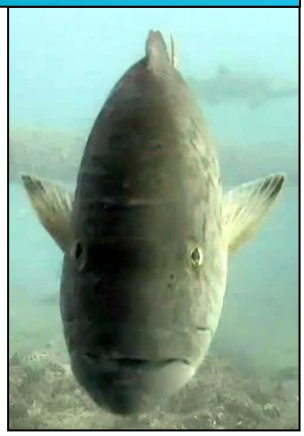
Distinguishing characteristics:
From the side the gag has the typical grouper body shaped like an elongated oval with a protruding lower lip. The body has many dark markings that form no pattern and are often called "wormy." The markings are difficult to see if the fish is dark colored or in silhouette. The tail is squared off or slightly convex, and the pectoral and anal fins are rounded. Close up, short dark lines can be seen radiating from the eye. This is the grouper seen most frequently on SharkCam.

NOTE: Gag color and pattern differences are related to social behaviors. See the Additional Information entry and https://youtu.be/yFKheZy5kqo.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Black Grouper (*Mycteroperca bonaci*), Goliath Grouper (*Epinephelus itajara*), Scamp (*Mycteroperca phenax*), Cubera Snapper (*Lutjanus cyanopterus*)

Gag are frequently seen on SharkCam and the only other relatively abundant grouper is the scamp. In contrast, few black or goliath grouper have been seen on SharkCam. Gag and black grouper are easily mistaken, especially at a distance from the camera as their body shapes and silhouettes are very similar. In good light black grouper are distinguished from gag by the dark band on the caudal fin margin for black grouper and by the presence of white edges to the pectoral and anal fins on gag. Patterns on the body are formed by lighter lines and blotches in black grouper, while lines and blotches on gags are formed by darker areas.



The rear edge of the scamp anal fin is straight with an elongated tip in larger fish, in contrast to the rounded margin of the gag anal fin. The body of the adult scamp is covered with dark dots that tend to form lines on the lower part and roughly shaped rings on the upper, rings that are sometimes called "cat's paws." The markings are difficult to see if the fish is dark colored or in silhouette but the differently shaped tails and anal fins still distinguish the species at distance. Young scamps have squarer tails like the gag but have body markings and a straight rear edge of the anal fin like the adult scamp.

Cubera snappers have a similar body shape but do not have the protruding lower lip and their canine teeth are typically visible. Either they have no body markings or they have bars.

Black Grouper

***Mycteroperca bonaci* (Poey, 1860)**
Serranidae

Distinguishing characteristics:
Black grouper have the typical grouper body shape, with a relatively thick, oval body cross section, and a protruding lower lip. Color and pattern are variable and able to change quickly. The body colors typically are brown, olive, and gray, often including a yellowish hue with dark brown to black edges on fins. Darker fins are especially apparent as a dark band at the edge of the caudal fin and dark edges on the second dorsal fin and anal fin. If visible, the pelvic fins will show a similar dark edge. Patterns on the body are variable, but when present are distinct. They often appear as irregular blotches and wavy lines formed by lighter areas. A close approach to the camera may reveal that the lighter lines are composed of small spots.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Gag (*Mycteroperca microlepis*), Goliath Grouper (*Epinephelus itajara*), Scamp (*Mycteroperca phenax*), Cubera Snapper (*Lutjanus cyanopterus*)

Few black grouper have been seen on SharkCam, and they are easily mistaken, especially at a distance from the camera, for gag, as their body shapes and silhouettes are very similar. In good light, black grouper are distinguished from gag by the dark band on the caudal fin margin and by the lack of white edges to the pectoral and anal fins. Patterns on the body are formed by lighter lines and blotches in black grouper, while lines and blotches on gags are formed by darker areas.

The goliath grouper will always have a much deeper body than black grouper and gag, while the scamp tends to be thinner in cross section than any of the other species. Scamp are also distinguished by other reliable characteristics like the caudal and anal fin margin shapes, and goliath grouper have a clearly rounded caudal fin. A feature that the other large groupers do not have.

Cubera snappers have a similar heavy body shape but are deeper bodied and they do not have the protruding lower lip of groupers. They are more compressed in cross-section relative to black grouper.

Goliath Grouper

***Epinephelus itajara* (Lichtenstein, 1822)**
Serranidae

Distinguishing characteristics:
The goliath grouper body is deep and wide, appearing oval-shaped from the side, and shows the typical grouper protruding lower lip. The tail is rounded. Irregularly shaped dark bars show on the light-colored bodies and tails of smaller fish but lose their definition, becoming mottled blotches starting at the front, as the fish grows. A close approach will show fine black spots especially on the lips, head, and shoulder. Goliath grouper are the largest bony fish seen on SharkCam.

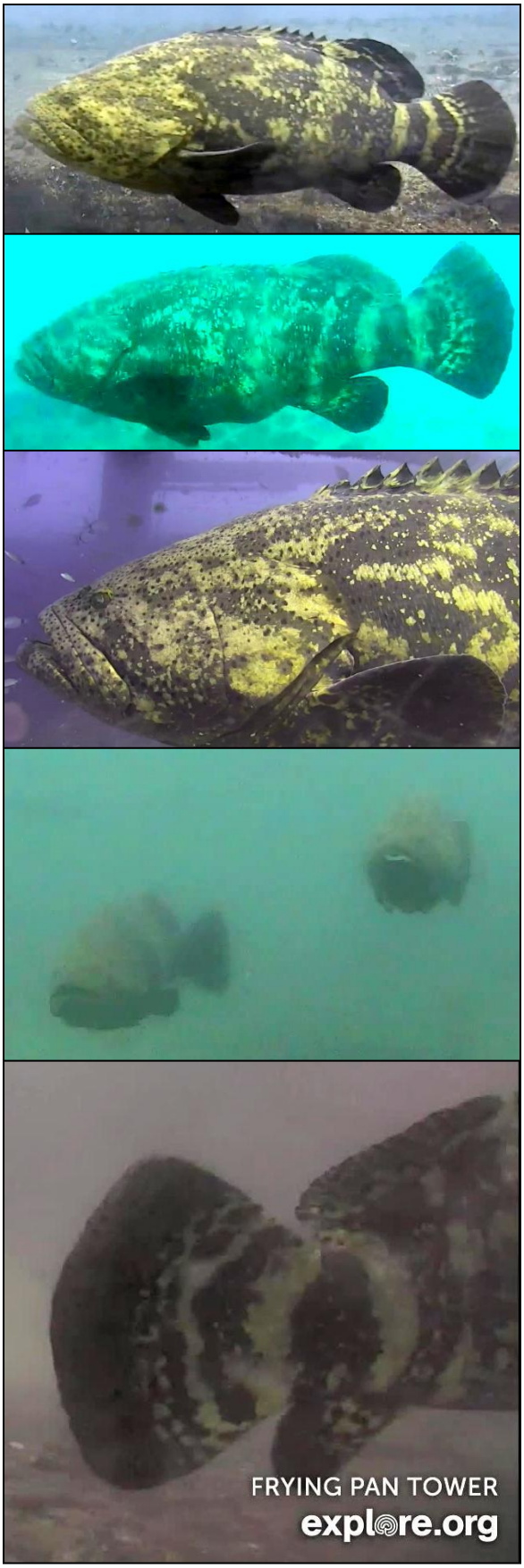
Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Goliath grouper have been closed to harvesting in the US southeast since 1990. Their populations have rebounded somewhat in the region in recent years.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Gag (*Mycteroperca microlepis*), Scamp (*Mycteroperca phenax*), Cubera Snapper (*Lutjanus cyanopterus*)

Gags and scamps have the same body shape, but are substantially less deep bodied than the goliath grouper. All possess the protruding lower lip of the goliath grouper, but neither gag nor scamp have a rounded tail. Cubera snappers have a similar body shape but do not have the protruding lower lip or rounded tail, and are more compressed in cross-section.



Scamp

***Mycteroperca phenax* Jordan and Swain, 1884**
Serranidae

Distinguishing characteristics:
From the side the scamp has the typical grouper body shaped like an elongated oval with a protruding lower lip. Smaller scamp have roughly squared-off tails, but as they grow the tips of their tail become elongated into what are called "exserts." The tail's trailing edge can be marginally scalloped, with the upper and lower portions slightly concave and the middle portion slightly convex. The rear edge of the scamp anal fin is straight and develops an elongated tip as the fish grows.

On SharkCam, scamp bodies have been moderately dark, generally olive green to brown, with darker markings and fins. The markings can be all-dots, dots aggregated to form tightly spaced and irregular short lines, dots that form roughly shaped rings (called "cat's paws") or rectangles, or some combination. The markings are difficult to see if the fish is dark-colored or in silhouette. The back edge of the upper jaw and the lower lip may show a yellowish blush in good lighting.

NOTE: Color and pattern differences in scamp are related to social behaviors. See the Additional Information entry.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Gag (*Mycteroperca microlepis*), Goliath Grouper (*Epinephelus itajara*), Cubera Snapper (*Lutjanus cyanopterus*)

The gag and the goliath grouper have similar body shapes and protruding lower lips as the scamp. The gag has a square tail and the goliath grouper has a rounded tail, neither tail having the elongated tips of the adult scamp. Gags have square tails like the young scamp but "wormy" markings rather than the scamp's "cat's paw" markings, and a rounded anal fin with no straight edge like the scamp.

Cubera snappers have a similar body shape but do not have the protruding lower lip. Their canine teeth are typically visible. They have square tails with no elongated tips, and they lack body markings or they have bars.

Dark phase individual with tail exserts (top two images), spotted phase (middle), and cat's paw phase (bottom two images).

Graysby

***Cephalopholis cruentata* (Lacepède, 1802)**
Serranidae

Distinguishing characteristics:
The graysby shares the general characteristics of the groupers and sea basses, including an oval-shaped, stout body, a rounded body cross section, and a protruding lower lip. The mouth is large if opened and the eyes are set relatively high on the head and slightly protuberant. The tail is distinctly rounded relative to other groupers. Pectoral fins are rounded and often held out away from the body. These are used for close maneuvering near the bottom.

Coloration and pattern on SharkCam are highly variable. Three dark spots are present along the bottom of the dorsal fin on each side. Close approach to the camera may reveal lighter streaks on the head that radiate from the eye towards the gill cover and a multitude of small, darker (orange-red in good light) spots completely covering the head, fins, and body. The body background can vary from light to dark. Rarely, three pairs of white spots can be seen below the dorsal fin at the edges of the back.

See this video for an example of color and pattern change in graysby.

Graysby are likely to only be seen in close association to the bottom, and typically near overhanging cover.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Black Sea Bass (*Centropristis striata*), Whitespotted Soapfish (*Rypticus maculatus*), Greater Soapfish (*Rypticus saponaceus*)

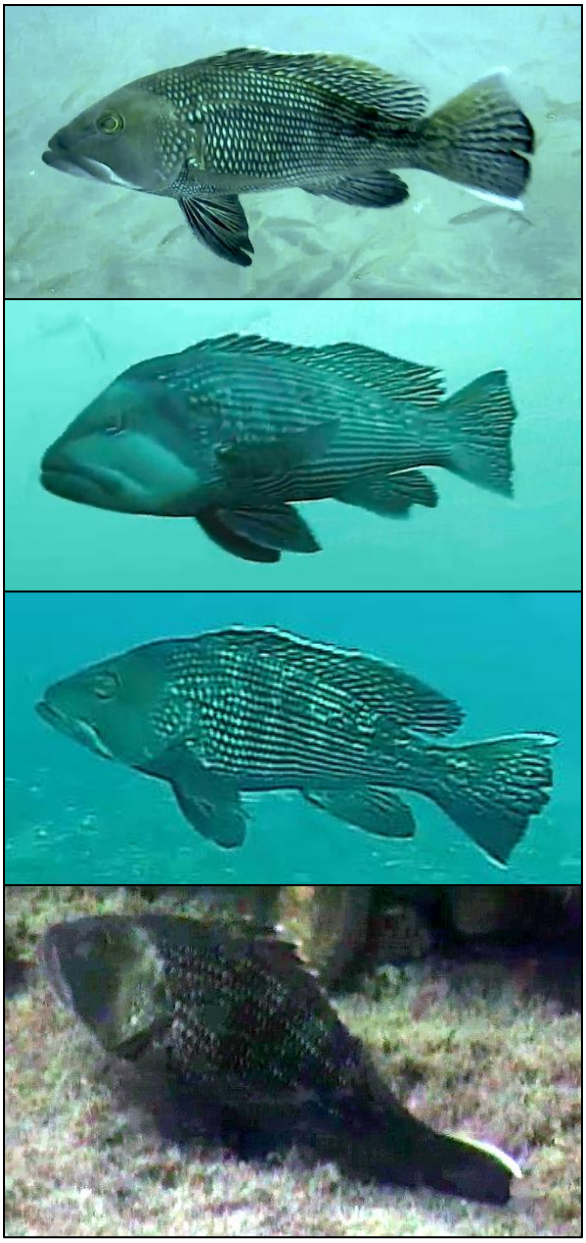
The graysby shares the grouper and sea bass characteristics with black sea bass and the soapfishes, all also members of the Serranidae.

It differs from the black sea bass in that the bass will always show body patterning, frequently including light saddles across the back of the body, and white edges to the dorsal and tail fins. The black sea bass tail will be squared or display a scalloped pattern, and it is often held relaxed or closed when close to the bottom, never rounded like the graysby. Graysby are unlikely to be seen off-bottom.

The whitespotted and greater soapfish are similar to the graysby in their dark coloration and close affinity for the bottom and overhanging cover. The whitespotted soapfish will have numerous small, lightly colored spots or freckles along the flanks, and the greater soapfish body is likely to be black and gray. The heads of both soapfishes appears small and pointed relative to the more symmetrical head of the graysby. When viewed from above or face-on the soapfishes are noticeably thin, relative to the rounded body of the graysby.

Black Sea Bass

***Centropristis striata* (Linnaeus, 1758)**
Serranidae



Distinguishing characteristics:
Black sea basses swim primarily using their large pectoral fins. When near the bottom, they tend to swim with their tails relaxed, closed, and with a humped-back profile. The body is mostly black. Their tails have white borders on the top and bottom and are roughly truncate with an irregular, often convex, edge, except for large individuals that start to develop caudal fin extensions from the tips and center, giving the appearance of a three-lobed or scalloped tail. Their dorsal fins have white tips. In good lighting and proximity to the camera, they show narrow white stripes formed from dots on the scale edges that run from the head to the tail. Smaller females may appear more dark brown than black and often have indistinct lighter saddles across the dorsal surface.

The lips and especially the protruding lower jaw are prominent, a similarity with other members of family Serranidae, the groupers and sea basses. Close up, their bulging eyes are apparent. Adult males will often have a lighter gray head and, during breeding season, a noticeable forehead bump called a nuchal lump.

Black sea bass frequently hover motionless just above or resting on the bottom with their pelvic fins. They are often curious and will closely approach disturbances near the bottom, and when round scad approach the bottom, black sea bass will rise up in hopes of snatching a meal.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Graysby (*Cephalopholis cruentata*), Tautog (*Tautoga onitis*)

The graysby shares characteristics of the family Serranidae with the black sea bass and both will frequently be seen moving near the bottom. The graysby lacks white edges to the dorsal and tail fins and will never have light colored saddles across the back.

The tautog shares several characteristics with the black sea bass: swimming style, gray, brown or black body, and white highlights on the long dorsal fin and tail. The tautog is typically longer and stockier than the black sea bass and has prominent lightly colored lips and chin. The tautog does not have white stripes like the black sea bass.

Greater Soapfish

***Rypticus saponaceus* (Bloch and Schneider, 1801)**
Serranidae

Distinguishing characteristics:
With their large dorsal and anal fins, greater soapfish are wedge-shaped, like a door stop, with a rounded tail. The head is small and has a slightly protruding lower lip, characteristic of the family Serranidae. The body profile is very narrow. They are dark charcoal to light gray, with the face and rear ⅓ to ½ of the body often darker than the forward and mid-body sections. Light and dark gray mottling or fine streaks of these tones may be apparent.

Swimming, the fish looks sinuous, wriggling much of its body. It will nearly always be strongly associated with the bottom and typically an overhanging shelter. This species is nocturnal and is most likely to be seen early in the morning and late in the afternoon, or when the nighttime light is illuminated.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Whitespotted Soapfish (*Rypticus maculatus*), Cubbyu (*Pareques umbrosus*)

The body silhouette and habits of the whitespotted soapfish are very similar to the greater soapfish. In comparison to the charcoal to light gray of the greater soapfish, the whitespotted soapfish is typically smaller, more frequently seen, and will show hints of brown to tan. A light dorsal stripe from the lips and up the head between the eyes and distinct white spots on the flanks clearly distinguish the whitespotted soapfish from the greater soapfish.

The cubbyu is another dark fish that is frequently seen at the bottom. The cubbyu tends to be more of a social fish than the soapfishes, often seen in groups of four to eight. The soapfishes lacks the distinctive first dorsal fin of the cubbyu.

Whitespotted Soapfish

***Rypticus maculatus* Holbrook, 1855**
Serranidae




Distinguishing characteristics:
With their large dorsal and anal fins, whitespotted soapfish are wedge-shaped, like a door stop, with a rounded tail. The body profile is very narrow. They are dark brown to golden-colored, paler underneath, and have a light stripe that runs from the mouth, between the eyes, and up the back to the dorsal fin. Up close, randomly placed small white spots may be seen on the flanks, and in good light, the fish will appear dark brown with lighter tan to cream on the dorsal stripe. The eyes are set high on the head, and when viewed from in front, they are noticeably close together and dark.

Swimming, the fish looks sinuous, wriggling much of its body. It will nearly always be strongly associated with the bottom and typically an overhanging shelter. This species is nocturnal and is most likely to be seen early in the morning and late in the afternoon. When the nighttime light is illuminated, whitespotted soapfish are very active.

NOTE: Videos from winter 2015 until spring 2016 (see SharkCam videos below) appear to show whitespotted soapfish engaging in cleaner fish behavior with client groupers. Please report instances of this or similar behaviors by whitespotted soapfish.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Greater Soapfish (*Rypticus saponaceus*), Cubbyu (*Pareques umbrosus*)

The body silhouette and habits of the greater soapfish are very similar to the whitespotted soapfish. The greater soapfish is typically larger, less frequently seen, and has charcoal to light gray body colors, while the whitespotted soapfish shows hints of brown to tan, and yellow. Greater soapfish lack a light dorsal stripe lips and also lack distinct white spots on the flanks. The body pattern of the greater soapfish, if present, is less distinct and clearly distinguishes the greater soapfish from the whitespotted soapfish.

The cubbyu is another all-dark fish that is frequently seen at the bottom. The cubbyu tends to be more gregarious than the soapfishes, often seen in groups of four to eight. The soapfishes lacks the distinctive first dorsal fin of the cubbyu.

Hogfish

***Lachnolaimus maximus* (Walbaum, 1792)**
Labridae

Initial phase female (top two images); transitional phase (3rd image); terminal phase male (bottom)

Distinguishing characteristics:
Hogfish, like all wrasses, swim using primarily their pectoral fins with little or no tail movement. Also like other wrasses, hogfish change color patterns as they go through juvenile, initial, and terminal maturation phases.

Initial and terminal phase hogfish are shaped similarly, but the terminal phase has a much-exaggerated snout, and are always male. Long tips to dorsal and anal fins give hogfish a slightly rectangular shape. The body is broad with a face that comes to a point and slopes back to the dorsal fin in almost a straight line. The angle of the slope of the head is greater in smaller (typically female) fish, and becomes more acute as fish transition to terminal phase males. The tail is almost as tall as the body and has long tips. Although not always visible, the first three spines on the dorsal fin are very long. Coloration on SharkCam ranges from pink-white in large, adult males to salmon-pink in smaller, female fish. Large individuals have a distinct dark brown snout and forehead that appears black. Darker coloration and mottling in juveniles and smaller female fish can make it difficult to see body markings. In natural light, hogfish are distinctly orange to pink.

Juvenile phase: Juvenile hogfish are very rectangular and will show strong mottling of white on a dark (brick red in good light) body as camouflage. A large black blotch on the rear base of the dorsal fin and strong barring on the tail will be obvious. The body is much more compressed (thin side-to-side) compared to the initial and terminal phases.
Initial phase: Initial phase hogfish have a small black blotch on the rear base of the dorsal fin, lack tail barring, and have none of the terminal-phase markings. This is the most common phase of hogfish seen on SharkCam.
Terminal phase: Terminal phase hogfish have a black bar on the base of their tail and a black spot on their side. The black blotch from the initial phase fades and is replaced by a black stripe at the base of the dorsal fin. On large individuals, the snout becomes elongated like a pig's, hence the common name.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

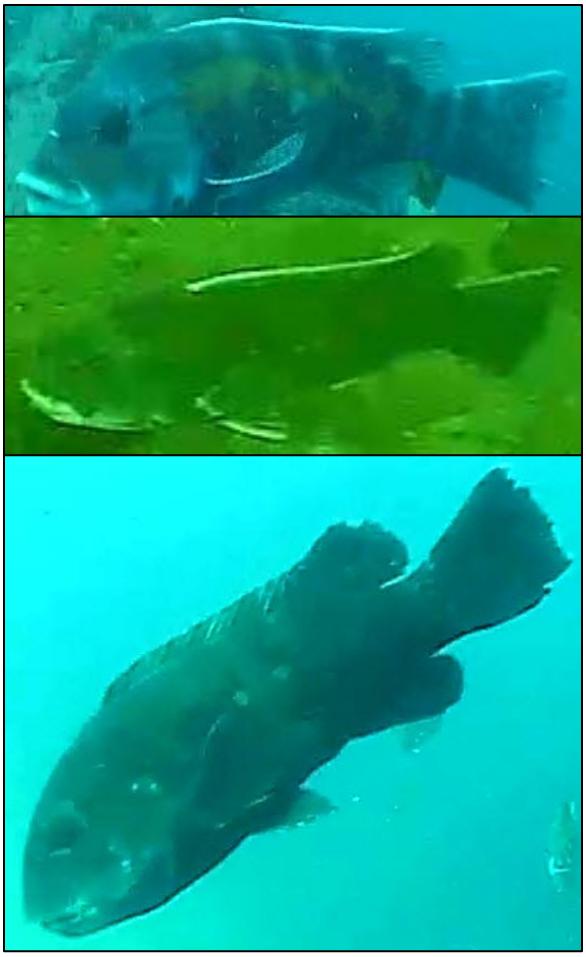
Similar species: No other fish seen on SharkCam resembles hogfish.

Hogfish and blue and queen angelfish have similar silhouettes: broad bodies with trailing dorsal and anal fins that give the fish a roughly rectangular shape, but the angelfishes have a small "face" that is clearly distinct from the much larger hogfish head. Unlike the hogfish, the angelfish swim using primarily their tails, which are relatively small with no trailing tips.

Juvenile hogfish are mottled white and brick red.

Tautog

***Tautoga onitis* (Linnaeus, 1758)**
Labridae



Distinguishing characteristics:
Like other wrasses, the tautog swims using primarily its pectoral fins with little or no tail movement. From the side, the body is shaped like an elongated oval with a bluntly rounded head. Tautog seen on SharkCam have been primarily males, and they have gray-black bodies with contrasting light-colored chin and lips. The dorsal fin tips are white and the tail has white edges on the top and bottom. Some individuals have light colored underparts and some have a white spot in the middle of the sides.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits

NOTE: Tautog are primarily a temperate fish that reaches the southern limit of its range in South Carolina.

Relative size: ○ ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in)

Similar species: Black Sea Bass (*Centropristis striata*)

The black sea bass shares several characteristics with the tautog: swimming style, dark body, and white highlights on the long dorsal fin and tail. The bass is not elongated like the tautog and does not have light colored lips and chin. The bass has narrow white stripes on the body that run from the head to the tail and are visible close up; the tautog has none.

Cobia

***Rachycentron canadum* (Linnaeus, 1766)**
Rachycentridae

Distinguishing characteristics:
From the side, a cobia is elongated and thick-bodied with a rather pointed, flattened head. It has a large, shallowly forked tail with sharp tips, and a triangular dorsal fin. The cobia body and fin coloration are dark, although it may have some lighter tones underneath. The cobia swims with its dorsal fin erect and its large pectoral fins outstretched and horizontal. When excited, thick, high contrast dark and light stripes may be present running the length of the body.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits

Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: Sharksucker (*Echeneis naucrates*), Whitefin Sharksucker (*Echeneis neucratoides*), Rainbow Runner (*Elagatis bipinnulata*), Greater Amberjack (*Seriola dumerili*)

A cobia could be mistaken for some species of shark, due to its elongated shape, forked tail, pointed fins and tail lobes, erect dorsal fin, and outstretched, horizontal pectoral fins. SharkCam shark species, however, do not have symmetrical tails like the cobia. Instead, the upper lobe of the sharks' tail is much larger than the lower lobe, being a significant portion of the sharks' length.

Sharksuckers (genus *Echeneis*) resemble cobia in their elongated shape, typically dark coloration, and symmetrical tails. However, the forward portion of the dorsal fin on sharksuckers (the portion above the eyes) is modified into a sucking disc that allows them to attach to larger animals. Sharksuckers seen on SharkCam are typically much smaller than the typical cobia, and are most often seen attached to or in tight association with a larger fish or turtle. Cobia are sometimes seen associated with large rays or sharks and can be easily mistaken for a large sharksucker.

The rainbow runner and the greater amberjack have body shape similar to the cobia but their tails are more deeply forked, their heads are not flattened, and neither swim with outstretched pectoral fins.

SLOPING HEADS AND TAPERED BODIES (19)

Grunts–Haemulidae
- Boga
- Black Margate
- Porkfish
- Striped Grunt
- Tomtate
- White Grunt
- White Margate

Snappers–Lutjanidae
- Cubera Snapper
- Gray Snapper
- Vermilion Snapper
- Yellowtail Snapper

Drums–Sciaenidae
- Red Drum
- Spot

Porgies–Sparidae
- Knobbed Porgy
- Red Porgy
- Saucereye Porgy
- Scup
- Sheepshead
- Spottail Pinfish

Cubera snapper *Lutjanus cyanopterus* (foreground) can reach very large sizes, rivalling the largest bony fish on SharkCam, the goliath grouper *Epinephelus itajara* (background). Image credit: Explore.org/CamOp Christine/5girls

Cubera Snapper

***Lutjanus cyanopterus* (Cuvier in Cuvier and Valenciennes, 1828) Lutjanidae**

Distinguishing characteristics:
From the side, the cubera snapper is shaped like an oval with a square tail. The lips are large and the lower lip does not protrude beyond the upper. Usually there are no distinctive body markings. However, some individuals can show bars. These bars are generally confined to the upper half of the body. Up close, the cubera's large canine teeth often show even if the mouth is closed.

Relative frequency: Unmarked individuals: ● ● Uncommon–seen in 1% to 10% of visits; Barred individuals: ● Rare–seen in less than 1% of visits

Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Gag (*Mycteroperca microlepis*), Gray Snapper (*Lutjanus griseus*)

The gag has a similar body and tail shape and large lips, and its body is often dark with darker fins. However, the grouper's protruding lip is a feature the cubera does not have. When lighter colored, the grouper's body shows short, dark, squiggly lines that the cubera does not have.

The gray snapper and the cubera have similar body and tail shapes consistent with their inclusion in the genus *Lutjanus*. SharkCam gray snappers have all had light gray colored bodies, unlike the darker cubera. They also often show a nuchal mark, a feature the cubera does not have.

Gray Snapper

***Lutjanus griseus* (Linnaeus, 1758)**
Lutjanidae

Distinguishing characteristics:
From the side, the gray snapper is shaped like an oval with a sloped forehead and a square tail. On SharkCam, the body has been light gray. Fin coloration can vary between light gray like the body to a very dark tone. There is a dark ring around the eye, which, against the light-colored body, makes the eye look large. Gray snapper often shows a black band running from the mouth, through the eye, and up to the shoulder (above the base of the pectoral fin). This band is called a nuchal mark and can lighten to be almost nonexistent or darken dramatically. When dark, the band obscures the eye ring.

Gray snappers are often seen in small groups.

NOTE: A frequently used alternative common name for the gray snapper is mangrove snapper. This usage is very prevalent in North and South Carolina.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

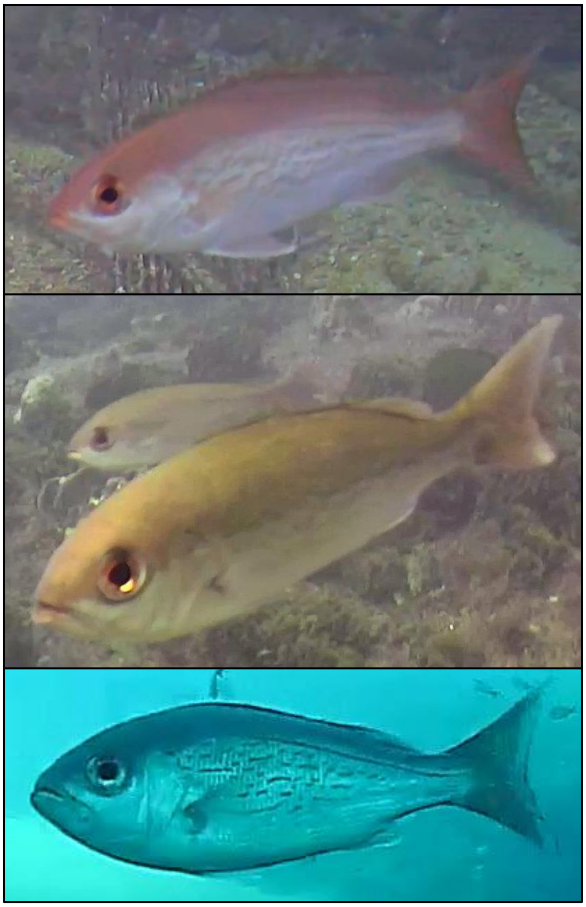
Similar species: Cubera Snapper (*Lutjanus cyanopterus*)

The cubera snapper and the gray snapper have similar body and tail shapes. SharkCam gray snappers have all had light gray colored bodies, unlike the darker cubera. Cubera lips are more prominent than the gray's, and the cubera does not show a nuchal mark. On SharkCam, cuberas look more robust, chunkier, than grays, and if close to the camera, may show protruding canine teeth.

SharkCam's color filter will show that gray snapper have hints of orange and brown body coloration.

Vermilion Snapper

***Rhomboplites aurorubens* (Cuvier in Cuvier and Valenciennes, 1829) Lutjanidae**



Distinguishing characteristics:
From the side a vermilion snapper is shaped like an elongated oval with a shallowly forked tail and a large eye. The diameter of the eye is equal to the distance between it and the snout. If the color filter on SharkCam is active, vermilion snapper bodies and fins are pink to red with the back darker. Close up, there are thin stripes made of dots and dashes along the mid-body.

Vermilion snappers are frequently seen in loosely associated groups of 5–20 individuals.

NOTE: A frequently used alternative common name for the vermilion snapper is beeliner.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Bigeye Scad (*Selar crumenophthalmus*)

The bigeye scad has a similar body shape and large eye but has a deeply forked tail. The difference between the pinkish-red vermilion snapper and the silvery bigeye scad will be apparent unless the fish are in silhouette.

Bigeye scad will almost always be in large schools, often mixed with another small jack, the round scad. Vermilion snappers will usually be in much smaller groups or seen individually. When seen together, the vermilion snapper is noticeably larger than the bigeye scad.

Yellowtail Snapper

***Ocyurus chrysurus* (Bloch, 1791)**
Lutjanidae

Distinguishing characteristics:
From the side, the yellowtail snapper is oval shaped with a deeply forked tail that has pointed lobes. The body is light colored with a stripe that starts as yellow at the tail and becomes darker towards the eye. Good lighting and a close approach to the camera may reveal the presence of small yellow spots above the midline stripe.

Relative frequency: ● ● ● Occasional–seen in 10% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Horse-eye Jack (*Caranx latus*), Yellow Jack (*Carangoides bartholomaei*)

A horse-eye jack has a similar shape, light body coloring, and a forked yellow tail with pointed lobes. Unlike the yellowtail snapper, the horse-eye jack has no yellow stripe but has a narrow dark stripe that runs from the tail about half way to the mouth and has a large eye.

A yellow jack also has a similar shape, light body coloring, and a forked yellow tail with pointed lobes. Unlike the yellowtail snapper, the yellow jack has no yellow stripe.

Knobbed Porgy

***Calamus nodosus* Randall and Caldwell, 1966**
Sparidae

Distinguishing characteristics:
The knobbed porgy has an oval-shaped body with a sharp hump between its face and back profiles where they join. The highest part of its body, the hump, is forward of the body's centerline, approximately above its pectoral fin. The profile of its face is roughly a straight line from its mouth to the hump, and the profiles of the face and underside form an approximately 75-degree angle. On SharkCam, the body and fin color are a silvery light gray. If seen close to the camera, small speckles and fine stripes of blue and yellow may be apparent, especially on the face.

Knobbed porgies, like other porgies, are often seen slowly swimming close to the bottom with frequent brief stops. This start and stop behavior is a hunting technique, and it helps distinguish porgies from other species.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Red Porgy (*Pagrus pagrus*), Saucereye Porgy (*Calamus calamus*), Scup (*Stenotomus chrysops*)

Three other porgies seen on SharkCam have somewhat similar body shapes and coloration, the red and saucereye porgies, and the scup. None has a back as sharply humped as the knobbed porgy. The profiles of the red porgy and scup faces are a gentle curve from mouth to back, and the profile of the saucereye porgy face is roughly a straight line from its mouth to a point even with its eye, where it makes a bend and continues straight across its nape to its back. These profiles differ from the steep, straight knobbed porgy profile. Finally, the red porgy is distinctly more elongated than the knobbed (and saucereye) porgy. Scup are the only porgy likely to be seen in a school. All others are typically alone, or seen near a few companions of the same species.

Red Porgy

***Pagrus pagrus* (Linnaeus, 1758)**
Sparidae

Distinguishing characteristics:
The red porgy has a slightly elongated oval-shaped body. The highest part of its back is forward of the centerline, approximately above its pectoral fin. The profile of its face is a gentle curve from its mouth to its back, where it continues curving to the base of its tail. In ambient light on SharkCam, its body and fin color is a silvery, light gray that can develop darker gray bars, but with the color filter will show that the body is a light pink, silvery gray, often with a darker pink or red edge to the tail.

Red porgies, like other porgies, are often seen slowly swimming close to the bottom with frequent brief stops. This start and stop behavior is a hunting technique, and it helps distinguish porgies from other species.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Knobbed Porgy (*Calamus nodosus*), Saucereye Porgy (*Calamus calamus*), Scup (*Stenotomus chrysops*)

Three other porgies seen on SharkCam have somewhat similar body shapes and coloration, the knobbed and saucereye porgies, and the scup. The profile of the knobbed porgy face is a straight line from its mouth to its back. The profile of the saucereye face is a straight line from its mouth to a point even with its eye, where it makes a bend and continues straight across its nape to its back. Both these profiles differ from the smooth curve from the red porgy's mouth to its tail. The scup profile is most similar to the red porgy, but the scup body is less elongated. Unlike the red porgy, the knobbed porgy has a sharp hump where facial and back profiles meet, and the red porgy is more elongated than the saucereye porgy or scup species. Scup are the only porgy likely to be seen in a school. All others are typically alone, or seen with only a few companions of the same species.

Saucereye Porgy

***Calamus calamus* (Valenciennes in Cuvier and Valenciennes, 1830) Sparidae**

Distinguishing characteristics:
The saucereye porgy has an oval-shaped body. The highest part of its back is forward of the body's centerline, approximately above its pectoral fin. The head profile is straight from its mouth to a point even with its eye, where it makes a bend and continues straight across its nape to its back. On SharkCam, the saucereye body and fin color is a silvery, light gray that can develop darker gray bars. Despite its name, the saucereye's eye is not larger than those of other porgies. Instead, a clear close-up will show a small, blue "saucer" (curved line) under the eye.

Saucereye porgies, like other porgies, are often seen slowly swimming close to the bottom with frequent brief stops. This start and stop behavior is a hunting technique, and it helps distinguish porgies from other species.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Knobbed Porgy (*Calamus nodosus*), Red Porgy (*Pagrus pagrus*), Scup (*Stenotomus chrysops*)

Three other porgies seen on SharkCam have somewhat similar body shapes and coloration, the knobbed and red porgies, and the scup. The profile of the knobbed porgy head is a straight line from its mouth to its back. The profile of the red porgy head is a smooth curve from its mouth to the base of its tail. Both these profiles differ from that of the saucereye, which is roughly straight from the mouth to the eye and, with a bend there, straight across its nape to its back. The scup profile is a gentler slope, compared to the saucereye porgy (or knobbed porgy). Unlike the red porgy, the knobbed porgy has a sharp hump where facial and back profiles meet, and the red porgy is more elongated than the saucereye, knobbed porgy, or scup. Scup are the only porgy likely to be seen in a school. All others are typically alone, or seen with only a few companions of the same species.

Scup

***Stenotomus chrysops* (Linnaeus, 1766)**
Sparidae

Distinguishing characteristics:
The scup has the classical sloping head and tapered body of the porgies. The head to back profile is a gentle slope to the deepest portion of the body located in-line with the origin of the pectoral and pelvic fins. The body lacks distinguishing marks and will appear silvery-white in most light conditions. A close approach to the camera, or clear water, may reveal a blue patch over the eye. It shows up on the SharkCam as a white eyebrow that gives the fish a woebegone look.

Scup, like other porgies, are often seen slowly swimming close to the bottom with frequent brief stops. This start and stop behavior is a hunting technique, and it helps distinguish porgies from other species. All sightings of scup on SharkCam have been as parts of loosely aggregated schools of similarly sized individuals.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Scup are considered primarily northern and inshore fish that may undergo seasonal southward and deeper migration during the fall in order to overwinter offshore. This migration reverses in the spring. Scup have only been positively identified from SharkCam over a two-week period in May 2016.

Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Knobbed Porgy (*Calamus nodosus*), Red Porgy (*Pagrus pagrus*), Saucereye Porgy (*Calamus calamus*), Spottail Pinfish (*Diplodus holbrookii*)

Three other porgies seen on SharkCam have somewhat similar body shapes and coloration, the knobbed, saucereye, and red porgies. The profile of the knobbed porgy head is a straight line from its mouth to its back. The profile of the red porgy head is a smooth curve from its mouth to the base of its tail, and both these profiles differ from that of the saucereye, which is roughly straight from the mouth to the eye and, with a bend there, straight across its nape to its back. The scup profile is a gentler slope compared to the saucereye porgy (or knobbed porgy). Unlike the red porgy, the knobbed porgy has a sharp hump where facial and back profiles meet, and the red porgy is more elongated than the saucereye, knobbed porgy, or scup. Scup are the only porgy likely to be seen in a school. All others are typically alone, or seen with only a few companions of the same species.

Scup may be mistaken for the spottail pinfish, as the head and back profile are similar between the species; however, spottail pinfish are more disc-shaped. Spottail pinfish will always have a distinctive dark blotch across the caudal peduncle composed of a wide, black band that encircles the base of the tail and a dark line that extends up the back and down the belly from the band.

Sheepshead

***Archosargus probatocephalus* (Walbaum, 1792)**
Sparidae

Distinguishing characteristics:
From the side, a sheepshead has an oval-shaped body that is light colored with a gray head and six to seven silvery-gray and gray-black alternating bars (zebra-like). The highest part of its back is forward of the body's centerline, approximately over its pectoral fins. Sheepsheads move rather sedately through the water. A close approach to the camera may reveal the strangely human-like teeth, used for scraping hard shelled prey, like barnacles and molluscs, from the tower legs or bottom.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Sergeant Major (*Abudefduf saxatilis*), Atlantic Spadefish (*Chaetodipterus faber*), juvenile Banded Rudderfish (*Seriola zonata*)

Other fish seen on SharkCam that have dark bars include sergeant majors, Atlantic spadefish, and juvenile banded rudderfish.

A sergeant major is very small compared to the sheepshead, and it will always have some yellow on the body, a color that the sheepshead never has.

The Atlantic spadefish differs by being spade-shaped (triangular) and having a gray body. In addition, spadefish bars fade one by one with age, so they have varying numbers of bars.

The juvenile banded rudderfish differs by having jack family (Carangidae) characteristics of an elongated body shape, a thin tail, and a dark band, which runs from the mouth, across the eye, to the front of the dorsal fin. Their bands are typically faint.

Spottail Pinfish

***Diplodus holbrookii* (Bean, 1878)**
Sparidae

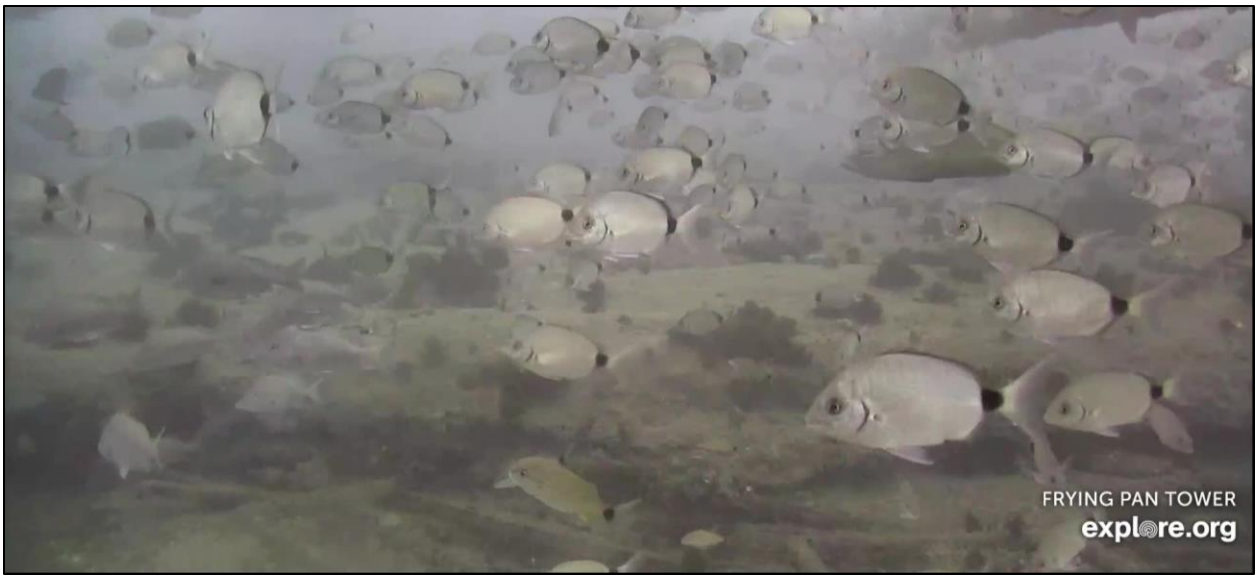
Distinguishing characteristics:
From the side, the spottail pinfish is shaped like an oval with a light colored silvery-gray body. When seen with ample light the body may have a golden sheen. A wide, black band encircles the base of the tail and a dark line extends up the back and down the belly from the band. Close up, narrow scale rows alternating as dark and light stripes can be seen on the body. Depending on lighting conditions and proximity to the camera, faint vertical bars spaced evenly along the upper body may be present.

NOTE: This is the most frequently seen fish on SharkCam. It will be present in >95% of visits.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Tomtate (*Haemulon aurolineatum*), Bermuda Chub (*Kyphosus sectatrix*)

Two species are often seen with the spottail pinfish, the tomtate and the Bermuda chub. The tomtate has a large, dark blotch at the base of its tail, similar to the spottail pinfish, but no dark lines extend up the back and down the belly and its body shape is more elongated (less tall). The Bermuda chub can be light colored like the pinfish but has no dark band or blotch at the base of its tail, is larger than the pinfish, and is slightly egg-shaped with its tail at the wider end (helpful when in silhouette).



Spot

***Leiostomus xanthurus* Lacepède, 1802**
Sciaenidae

Distinguishing characteristics:
Spot are roughly oval-shaped. Their back is highly arched, sloping down at the forehead and culminating in a rounded nose. The mouth is small and under and behind the rounded nose. The belly is flat and straight with lighter white-yellow pelvic fins. Spot have two dorsal fins that are clearly separated. The first dorsal fin is short and triangular, but often collapsed. When fully raised, it is visibly taller than the second dorsal fin, which runs the rest of the length of the spot's back.

The spot is silvery-white in color and in good light will show a golden-yellow sheen. Sometimes, the black spot for which it gets its common name is visible just above the pectoral fin and behind the head. Thin, brownish, diagonal stripes may also be seen along the upper part of the back.

NOTE: Spot have only been identified on SharkCam once when a large school was visible most of 3 December 2021 starting at 10:50AM. Soon thereafter, mixed predators began an hours-long attack on the school. The remnants of the school lingered until dark.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Tomtate (*Haemulon aurolineatum*), Spottail Pinfish (*Diplodus holbrookii*), Scup (*Stenotomus chrysops*), Gray Snapper (*Lutjanus griseus*)

Spot are generically "fishy" and could be missed or ascribed to other much more common SharkCam species. Their silhouette is similar to spottail pinfish or tomtate, but these two are easily distinguished from spot by the black blotch at the base of the tail in both species. Spot lack this.

Scup may be mistaken for spot and are similarly rare. They share a schooling habit which makes both species unlikely to be mistaken for other porgies (the close relatives of scup). Scup on SharkCam have been unmarked, in contrast to the diagonal bars and "spot" of the spot. Scup start-stop behavior is also distinguishing.

The spot and gray snapper are similar in color and body shape. The forehead of the spot is rounded and steep, compared to the straight forehead and pointed snout of the gray snapper. The mouth of the spot is barely visible, while the gray snapper's jaws are long and apparent. The gray snapper lacks the striated pattern of the spot, while the spot lacks the nuchal mark (dark band over the eye) sometimes displayed by the gray snapper. When raised, the first dorsal fin of the spot is distinct from the second, unlike in the gray snapper.

Tomtate

***Haemulon aurolineatum* Cuvier in Cuvier and Valenciennes, 1830 Haemulidae**

Distinguishing characteristics:
From the side, a tomtate is shaped like a slightly elongated oval. Its body is light colored with a dark spot at the base of its tail. On some tomtates, the dark coloration of the spot radiates out along the top and bottom edges of the tail. It can have one or more dark, narrow stripes or no stripe at all.

Relative frequency: ● ● ● ● ● Common–seen often, greater than 50% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Spottail Pinfish (*Diplodus holbrookii*), Bigeye Scad (*Selar crumenophthalmus*), Round Scad (*Decapterus punctatus*), Striped Grunt (*Haemulon striatum*), Boga (*Haemulon vittatum*)

Tomtates are often seen with spottail pinfish but are distinguished by their elongated shape and lack of dark lines extending up the back and down the belly.

Young tomtates occasionally school with bigeye scad and round scad but are always distinguishable by the dark spot at the base of their tails and a deeper body than the scads.

The striped grunt and the tomtate both share a light background color, forked tail and horizontal stripes with the boga, their close relative. The striped grunt differs in that its stripes are bold, bronze-yellow, and more numerous than the thin stripes of the boga. The boga has a blue tint, while the striped grunt's background scales are essentially white. The boga's tail fin is also dark where the striped grunt's is fairly transparent, and the boga's body is slightly less deep when seen from the side.

The tomtate's body is substantially deeper than the boga's, with a more sloped forehead. The tomtate also possesses a black blotch of varying size at the base of its tail. Like the striped grunt, it lacks the bluish color and yellow snout of a typical boga.

Tomtates engage in "kissing" behaviors where individuals square off with mouths widely agape and push towards each other. This is believed to be a territorial or dominance display.

Striped Grunt

***Haemulon striatum* (Linnaeus, 1758)**
Haemulidae

Distinguishing characteristics:
From the side, a striped grunt is shaped like an elongated oval with about five dark stripes on a light-colored body (4–6 stripes, depending on age and lighting angle). The lowermost stripe is the widest and runs from beneath the eye to the middle of the tail. In good light the body has a yellowish tint, especially forward of the eye.

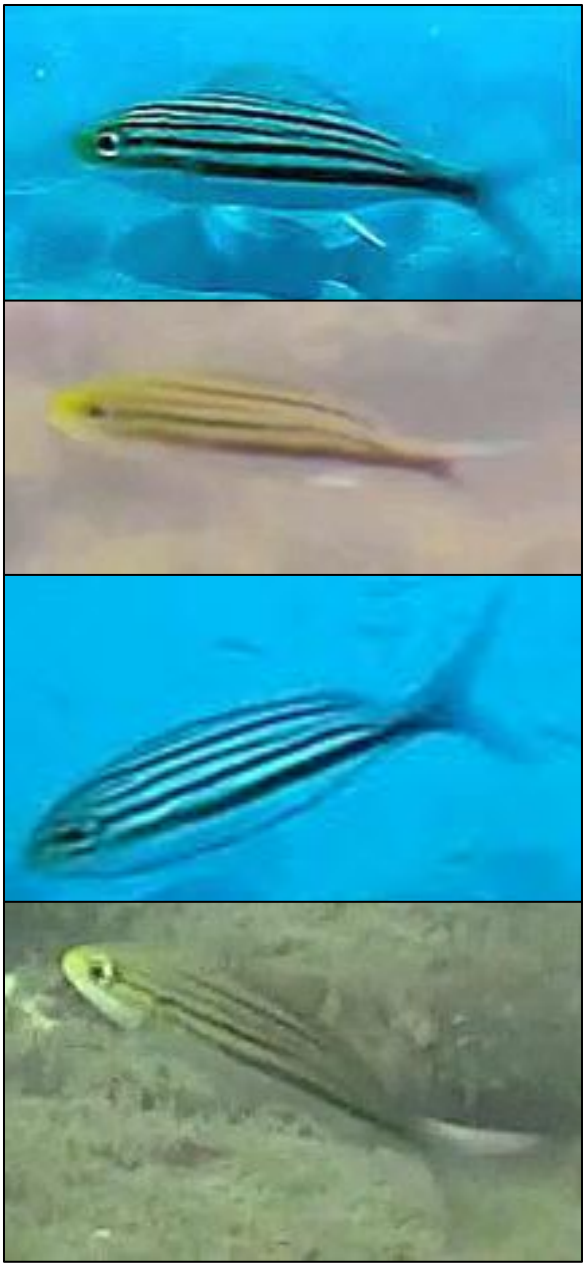
Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

NOTE: Observed striped grunt on SharkCam have usually been seen schooling with similarly sized fish of other species, usually tomtate.

Similar species: Tomtate (*Haemulon aurolineatum*), Boga (*Haemulon vittatum*)

Tomtates typically have a small to large and dark blotch at the base of the tail. Their bodies are deeper than the striped grunt with the maximum body depth occurring at the back of the head where the dorsal fin occurs. Their stripes are often variable, ranging from absent to faint, and of variable number.

Boga are more elongated and slender than the striped grunt. Boga stripes and general body coloration are silvery-blue, compared to the brown and yellow hues of the striped grunt. The number of stripes differs as well, with the boga generally showing only two stripes, while the striped grunt will have 4–6.



Boga

***Haemulon vittatum* (Poey, 1860)**
Haemulidae

Distinguishing characteristics:
Seen from the side, the boga's body is shaped like a slender, elongated oval. It is generally silvery-blue in color, with thin, dark stripes along its side and a yellow-tinged snout. When visible, its tail appears forked with a black outline on the inside edges of each tail lobe.

It has mostly been seen among loose shoals of tomtates.

NOTE: The boga is sometimes also known as the bonnetmouth for its wide gape.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Round Scad (*Decapterus punctatus*), Striped Grunt (*Haemulon striatum*), Tomtate (*Haemulon aurolineatum*), Scaled Herring (*Harengula jaguana*)

The boga closely resembles the round scad, especially in motion. It can be distinguished mainly by its several dark stripes and yellow snout, which the round scad lacks. The boga also appears to be more of a blue color than the round scad. Unlike the round scad, it has not been seen so far in large schools of its own species, instead shoaling mostly with tomtates. The scaled herring also lacks the yellow snout and multiple stripes of the boga (possessing only one). The boga's body is not as deep as the scaled herring's, and will appear rounder from the front. Neither the round scad nor the scaled herring have dark inside edges of the tail like the boga.

The striped grunt and the tomtate both share a light background color, forked tail and horizontal stripes with the boga, their close relative. The striped grunt differs in that its stripes are bold, bronze-yellow, and more numerous than the thin stripes of the boga. The boga has a blue tint, while the striped grunt's background scales are essentially white. The boga's tail fin is also dark where the striped grunt's is fairly transparent, and the boga's body is slightly less deep when seen from the side.

The tomtate's body is substantially deeper than the boga's, with a more sloped forehead. The tomtate also possesses a black blotch of varying size at the base of its tail. Like the striped grunt, it lacks the bluish color and yellow snout of a typical boga.

White Grunt

***Haemulon plumierii* (Lacepède, 1801)**
Haemulidae

Distinguishing characteristics:
From the side, a white grunt is roughly oval shaped, with a somewhat flattened underside and a head profile that is straight from the mouth to the back. The underside and face form an approximately 45-degree angle.

On SharkCam, depending on the lighting angle, the white grunt usually looks dark or silvery-gray, but in good light it will may appear as a pale lemon color. The fins are of similar color and tone to the rest of the body, except that the pelvic fins have a white border. Up close, the head has numerous horizontal light blue lines, and the body shows narrow rows of dark- and light-toned scales. This is the only fish on SharkCam that tends to show a lighter back with a darker (gray) belly region when seen from a distance. The eye appears to have an iridescent ring around it.

Relative frequency: ● ● ● ● Frequent–seen in 50% to 20% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: White Margate (*Haemulon album*), Black Margate (*Anisotremus surinamensis*)

The white margate and white grunt are closely related members of genus *Haemulon* and have very similar silhouettes and are of relatively the same size and habits. The only distinctive differences are the dark gray to black fins of the white margate compared to the lack of color on the dorsal and caudal fins of white grunt. The angle of the head and belly of the grunt is a 45-dgree angle, compared to the 60-degree angle of the margate.

White grunts engage in "kissing" behaviors where individuals square off with mouths widely agape. This behavior may be accompanied by dramatic color and pattern changes and is believed to be a territorial or dominance display.

Black margate and white grunt both typically have gray bodies, but the fins of the margate are black, while those of the grunt are similar to the color of the body. The shapes of the heads are distinctly different. The white grunt head forms a straight line from the nose to the dorsal fin while the head of the black margate is a smooth curve from nose to fin. Both species have identifiable scales, but the black margate will mainly show them as contrasting black, dark-centered, scales at the high point of the body, and a large black patch behind the opercula. White grunt lack these features.

White Margate

***Haemulon album* Cuvier in Cuvier and Valenciennes, 1830 Haemulidae**

Distinguishing characteristics:
From the side, a white margate is roughly oval shaped, with a somewhat flattened underside and a head profile that is straight from the mouth to the back. The underside and face form an approximately 60-degree angle.

The dorsal and caudal fins are darker, gray to black, compared to the rest of the body, being gray to black, except for white borders on the pelvic fins. The eye appears to have an iridescent ring around it.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: White margate are rarely reported from North Carolina and may represent tropical strays. There have been three sightings during a short period of time on SharkCam. These are likely of the same individual and occurred on 16 November 2021, at 10:50AM and 4:26PM EST, and again on 19 November at 12:23PM EST.

Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: White Grunt (*Haemulon plumierii*), Black Margate (*Anisotremus surinamensis*)

The white grunt and white margate are closely related members of genus *Haemulon* and have very similar silhouettes and are of relatively the same size and habits. The only distinctive differences are the lack of color on the dorsal and caudal fins of white grunt, compared to the dark gray to black fins of the white margate. The angle of the head of the margate is closer to a 60-degree angle, compared to the 45-degree angle of the grunt.

Although their names are very similar, white margate and black margate are in different genera in the family Haemulidae (*Haemulon* and *Anisotremus*, respectively). Both have gray bodies and dark dorsal and caudal fins, but the shapes of the heads are distinctly different. The white margate head forms a straight line from the nose to the dorsal fin while the head of the black margate is a smooth curve from nose to fin. Additionally, the black margate has contrasting black, dark-centered, scales at the high point of the body, and a large black patch behind the operculum. White margate lack these features.

Black Margate

***Anisotremus surinamensis* (Bloch, 1791)**
Haemulidae

Distinguishing characteristics:
Black margate are fairly deep-bodied with the curved head sloping gently back to the dorsal fin. The body profile is noticeably deep with the greatest profile occurring behind the gill cover to the point where the dorsal fin begins. Body coloration is light to dark gray. Contrasting black, dark-centered, scales may be obvious at the high point of the body. A large black patch that blends into the gray body begins immediately behind the operculum and extends past mid-body towards the tail. It lightens and blends dorsally. The fins are all black, and the tail fin is deeply notched with rounded lobes.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: Black margate is considered a tropical species not normally seen in North Carolina. Sightings in October 2018 are likely all of the same individual and may represent a tropical stray.

Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: White Margate (*Haemulon album*), White Grunt (*Haemulon plumierii*)

Although their names are very similar, black margate and white margate are in different genera in the family Haemulidae (*Haemulon* and *Anisotremus*, respectively). Both have gray bodies and dark dorsal and caudal fins, but the shapes of the heads are distinctly different. The head of the black margate is a smooth curve from nose to dorsal fin, while that of the white margate head is a straight line from the nose to the fin. Additionally, the black margate has contrasting black, dark-centered, scales at the high point of the body, and a large black patch behind the operculum. White margate lack these features.

From a distance, the black margate may be confused with the white grunt. Black margate and white grunt both typically have gray bodies, but the fins of the margate are black, while those of the grunt are similar to the color of the body. Both may show prominent, dark-centered scales, especially on the dorsal surface, and both may appear to have a darker belly region. The slope of the head of the white grunt is straight-edged and joins the back at the dorsal fin in a straight line, while the forehead slope of the black margate has a gentle curve as it joins the back. The dark belly patch is prominent on the black margate while more a trick of the light or shadow in the white grunt. The snout of the black margate is rounded and short in comparison to the sharper and longer snout of the white grunt.

Porkfish

***Anisotremus virginicus* (Linnaeus, 1758)**
Haemulidae

Distinguishing characteristics:
From the side, the porkfish is roughly oval shaped, with a somewhat flattened underside and a steep forehead profile that is straight from the mouth to its highest point where the back meets the dorsal fin. The porkfish is notably deep bodied for a grunt.

Other grunts have a yellow sheen to their bodies, but the porkfish is the only one where bright yellow dominates the coloration, especially on the body and fins. Two black bars separated by a wide white bar run vertically and demarcate the head from the body. The first black bar is diagonal and runs from the rear edge of the mouth, through the eye, to the forehead. This bar is the width of the eye. The second black bar is vertical, traces the rear edge of the opercula (gill openings), and extends to the back at the beginning of the yellow dorsal fin. A bright white, slightly triangular, bar separates the black bars.

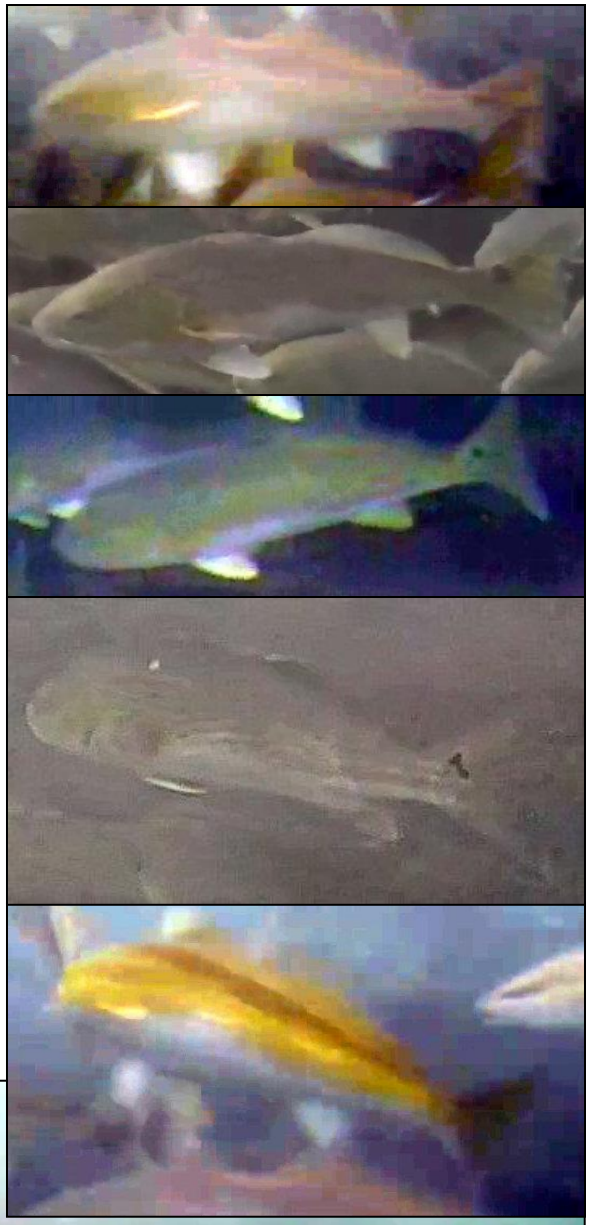
Evenly spaced and alternating yellow and white stripes extend from behind the opercula to the all-yellow tail.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: No other fish seen on SharkCam resemble porkfish.

Red Drum

***Sciaenops ocellatus* (Linnaeus, 1766)**
Sciaenidae



Distinguishing characteristics:
Red drum are elongated with a blunt, conical head. Body coloration above the mid-line is often copper-bronze, but may appear yellow-brown or even silvery depending on lighting conditions and individual variation. The belly is white. Red drum typically have one or more dark spots (ocelli, or eye-spots) with a lighter margin on the upper portion of the caudal peduncle, immediately preceding the caudal fin. The scales are large, but may be difficult to see except with a close approach to the camera.

On SharkCam, red drum sightings have usually been in large schools in the fall and winter. They are considered more of an inshore species.

NOTE: Red drum have several alternate common names, including redfish, channel bass, and puppy drum. They are designated the State Saltwater Fish of North Carolina.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: No other fish seen on SharkCam resembles red drum.

ODDLY-SHAPED SWIMMERS (15)

Trumpetfishes–Aulostomidae
- Trumpetfish

Triggerfishes–Balistidae
- Gray Triggerfish
- Ocean Triggerfish

Filefishes–Monacanthidae
- Orange Filefish
- Orangespotted Filefish
- Planehead Filefish
- Scrawled Filefish

Jacks and Pompanos–Carangidae
- Pilotfish

Porcupinefishes–Diodontidae
- Spot-fin Porcupinefish

Remoras–Echeneidae
- Sharksucker
- Whitefin Sharksucker

Cowfishes–Ostraciidae
- Scrawled Cowfish
- Spotted Trunkfish

Pufferfishes–Tetraodontidae
- Bandtail Puffer
- Sharpnose Puffer

Trumpetfish *Aulostomus maculatus* are long and thin and have a pipet-like mouth. The individual pictured here was photographed near Frying Pan Tower during a maintenance dive. They are rare on SharkCam. Image credit: Erin Burge

Gray Triggerfish

***Balistes capriscus* Gmelin, 1789**
Balistidae

Distinguishing characteristics:
The gray triggerfish swims using primarily its large, symmetric dorsal and anal fins, "flapping" them like a sideways bird. From the side the fish is oval-shaped with extended tips on its tail. Its color can be gray, tan, or a greenish version of either. The underside and one or two bars are lighter toned than the rest of the body.

A robust spine may be visible on the forehead. This spine is a modified dorsal fin spine which can be "triggered" defensively.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Ocean Triggerfish (*Canthidermis sufflamen*)

Compared with the ocean triggerfish, the gray triggerfish's dorsal and anal fins are shorter, wider, and dominant of the body silhouette. The gray triggerfish possesses a thinner tail base and more pronounced extensions on the tips of the tail fin. The body of the gray triggerfish is slightly more rounded than the gray triggerfish, and the mottled, sometimes speckled appearance of the gray triggerfish, is distinct from the uniform color and lack of pattern on the ocean triggerfish.

Ocean Triggerfish

***Canthidermis sufflamen* (Mitchill, 1815)**
Balistidae

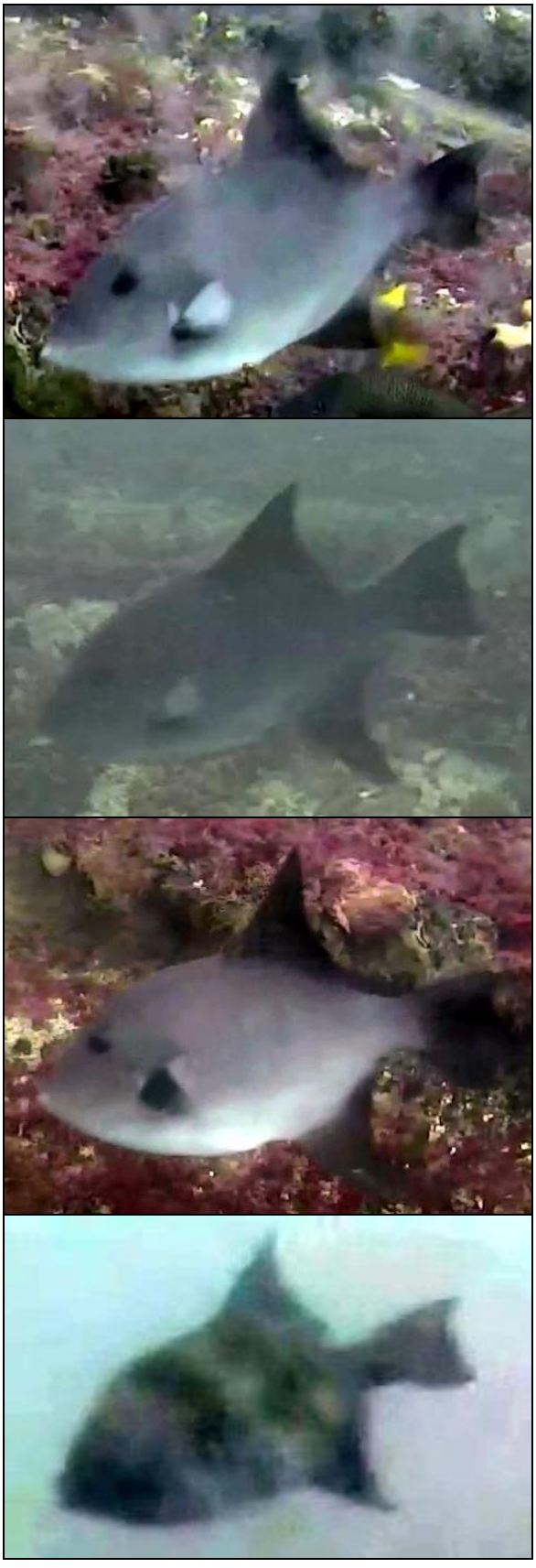
Distinguishing characteristics:
The ocean triggerfish swims primarily with its large, symmetrical dorsal and anal fins, "flapping" them like a sideways bird. From the side, the fish is oval-shaped. Its body can range from dark gray to nearly white, with fins that can be fully dark or edged with black. On SharkCam, ocean triggerfish have appeared gray in color with darker gray fins. Little to no body patterning is obviously present.

A robust spine may be visible on the forehead. This spine is a modified dorsal fin spine which can be "triggered" defensively.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

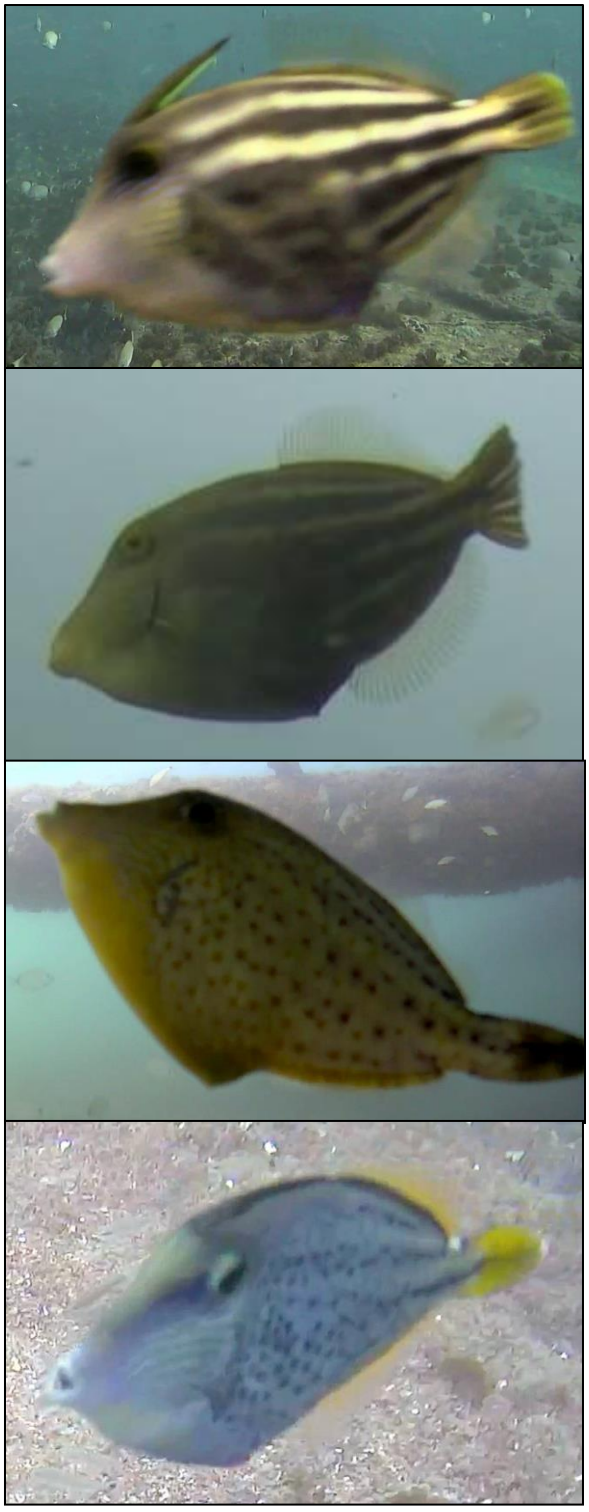
Similar species: Gray Triggerfish (*Balistes capriscus*)

Compared with the gray triggerfish, the ocean triggerfish's dorsal and anal fins are longer, narrower, and more prominent. The ocean triggerfish possesses a thicker tail base and less pronounced extensions on the tips of the tail fin. The body of the ocean triggerfish is slightly more streamlined than the gray triggerfish, and unlike the mottled, sometimes speckled appearance of the gray triggerfish, will be uniformly colored or nearly so.



Orangespotted Filefish

***Cantherhines pullus* (Ranzani, 1842)**
Monacanthidae



Distinguishing characteristics:
Orangespotted filefish swim using primarily its dorsal and anal fins with little or no tail movement. From the side, the orangespotted filefish is shaped like a diamond on its side, with the tail end slightly longer than its head end. The most common body pattern is alternating dark and light stripes that begin behind the eye and extend onto the tail. On the caudal peduncle is a white spot, and the tail itself is carried closed.

The orangespotted filefish name often appears to be a misnomer since the dominant body pattern is striped, and this typically obscures the fine orange spots on the body. Swimming fins and finer body markings are seen only when the orangespotted filefish closely approaches the camera.

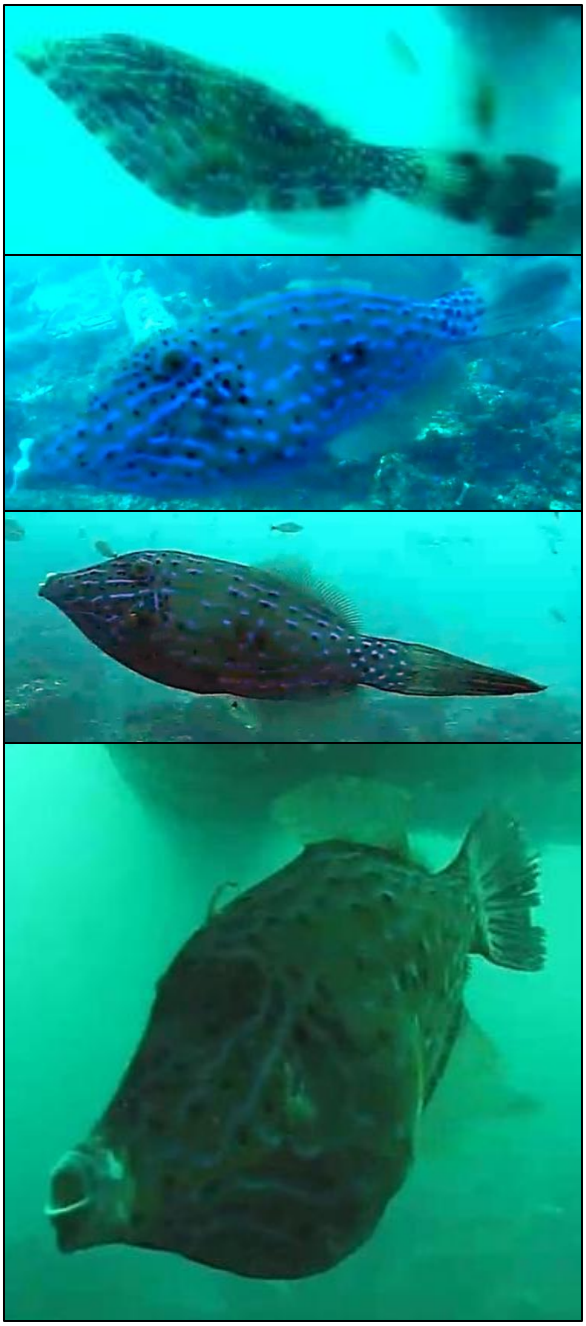
Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Scrawled Filefish (*Aluterus scriptus*), Orange Filefish (*Aluterus schoepfii*), Planehead Filefish (*Stephanolepis hispidus*)

Other filefishes swim with little or no tail movement; however, their body shapes are different. The scrawled and orangespotted filefish bodies are distinctly diamond-shaped, with the scrawled body very elongated, and the orangespotted a more symmetric diamond shape. Color and pattern are distinctly different, as well, with the scrawled color being dominated by blues, and the orangespotted body typically very dark brown with alternating dark and light stripes that extend onto the tail fin. The planehead filefish shares the general filefish body shape, but adults seen on SharkCam have been fairly uniformly colored in shades of light brown and gray. The dorsal and anal fins are much taller and more opaque than the typically short and indistinct fins of the others.

Scrawled Filefish

***Aluterus scriptus* (Osbeck, 1765)**
Monacanthidae



Distinguishing characteristics:
The scrawled filefish swims using primarily its dorsal and anal fins with little or no tail movement. From the side, the scrawled filefish is shaped like a slightly elongated oval with a long face that tapers to a small, upward pointing snout. The tail end is also long, finishing with a long, dark tail that may be carried closed and limp. More often the tail is slightly open and looking like a broom, earning the fish the nickname "broomtail." From the front or back, this filefish is very thin.

The scrawled filefish has an amazing ability to change colors and color patterns, often very quickly. On SharkCam, the most common combination of color and pattern is a dark background covered by a series of short, bright blue lines that are roughly oriented to reflect the body's outline. Interspersed among the lines are spots that may be very dark or very light toned. This combination includes white lips. Other combinations may include white edges to the blue lines, or a varying number of short, white, vertical lines, with or without any blue lines.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Orangespotted Filefish (*Cantherhines pullus*), Orange Filefish (*Aluterus schoepfii*), Planehead Filefish (*Stephanolepis hispidus*)

Other filefishes swim with little or no tail movement, however their body shapes are different. The scrawled and orangespotted filefish bodies are distinctly diamond-shaped, with the scrawled body very elongated, and the orangespotted a more symmetric diamond shape. Color and pattern are distinctly different, as well, with the scrawled color being dominated by blues, and the orangespotted body typically very dark brown with alternating dark and light stripes that extend onto the tail fin. The planehead filefish shares the general filefish body shape, but adults seen on SharkCam have been mottled in shades of light brown and gray and without the clear spots and lines of the scrawled filefish. The dorsal and anal fins are much taller and more opaque than the typically short and indistinct fins of the others.

Orange Filefish

***Aluterus schoepfii* (Walbaum, 1792)**
Monacanthidae

Distinguishing characteristics:
The orange filefish swims using primarily its dorsal and anal fins with little or no tail movement. It often swims at an angle, with its tail up and head pointed down. From the side the orange filefish is deep-bodied with a rounded forehead and a flat oval shaped body, which is extremely compressed. The eyes of the orange filefish are set relatively lower than other members of its family. The dorsal spine is thin and located at the crown of the head, and it may not be carried in an erect position. The lower jaw protrudes past the upper jaw and the mouth is upturned. The caudal fin is narrower than other filefish and triggerfish.

The orange filefish seen on SharkCam have always occurred as members of a pair where the brightly colored, yellow to orange male is distinctly different from the primarily brown female. Male orange filefish often have a mottled brown to gray upper body and an earthy orange lower body. Females tend to be mottled light to dark brown with indistinct stripes of darker coloration on the back half of the body. Like many filefishes, orange filefish have an amazing ability to change colors and color patterns, often very quickly.

Relative frequency: ● Rare–seen in less than 1% of visits
Size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Scrawled Filefish (*Aluterus scriptus*), Orangespotted Filefish (*Cantherhines pullus*), Planehead Filefish (*Stephanolepis hispidus*)

Other filefishes swim with little or no tail movement, however their body shapes are different. The scrawled and orangespotted filefish bodies are distinctly diamond-shaped, with the scrawled body very elongated, and the orangespotted a more symmetric diamond shape. Color and pattern are distinctly different, as well, with the scrawled color being dominated by blues, and the orangespotted body typically very dark brown with alternating dark and light stripes that extend onto the tail fin. The planehead filefish shares the general filefish body shape, but adults seen on SharkCam have been fairly uniformly colored in shades of light brown and gray. The dorsal and anal fins are much taller and more opaque than the typically short and indistinct fins of the others.

Planehead Filefish

***Stephanolepis hispidus* (Linnaeus, 1766)**
Monacanthidae




Distinguishing characteristics:
The planehead filefish swims using primarily its dorsal and anal fins with little or no tail movement. From the side, the planehead filefish is shaped like a diamond on its side, with the tail end slightly longer than its head end. The mouth protrudes noticeably, is slightly upturned, and, on SharkCam, it has been white around the lips extending slightly onto the face. Coloration is dark to light brown, and often mottled. The relatively large eye for a filefish is set high on the head. A distinct white spot is located at the origin of the pectoral fin. Planehead filefish have an elongated filamentous ray on the dorsal fin, and relatively tall dorsal and anal fins.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Scrawled Filefish (*Aluterus scriptus*), Orange Filefish (*Aluterus schoepfii*), Orangespotted Filefish (*Cantherhines pullus*), Gray Triggerfish (*Balistes capriscus*)

Other filefishes and the gray triggerfish also swim using their dorsal and anal fins with little to no tail movement. The gray triggerfish is distinguished from the planehead filefish by the terminal mouth, a scalloped tail fin that is held open, moderately thicker and more rounded body, and mottled gray coloration.

Other filefishes swim with little or no tail movement; however, their body shapes are different. The scrawled and orangespotted filefish bodies are distinctly diamond-shaped, with the scrawled body very elongated, and the orangespotted a more symmetric diamond shape. Color and pattern are distinctly different, as well, with the scrawled color being dominated by blues, and the orangespotted body typically very dark brown with alternating dark and light stripes that extend onto the tail fin. The planehead filefish shares the general filefish body shape, but adults seen on SharkCam have been fairly uniformly colored in shades of light brown and gray. The dorsal and anal fins are much taller and more opaque than the typically short and indistinct fins of the others.

Bandtail Puffer

***Sphoeroides spengleri* (Bloch, 1785)**
Tetraodontidae

Distinguishing characteristics:
The bandtail pufferfish is a small, slender fish that swims using its dorsal and anal fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. The upper body is dark with small white markings and bumps. The eyes are set high on the head and are protuberant. The lower body is white with a single dark stripe that turns to a row of dots towards the tail. The tail has two dark bars and is usually carried closed or relaxed.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ◌ Very small (<10 cm or 4 in) to Small (10–20 cm or 4–8 in)

Similar species: Bluehead (*Thalassoma bifasciatum*), Clown Wrasse (*Halichoeres maculipinna*), Slippery Dick (*Halichoeres bivittatus*)

Several SharkCam wrasses are small, slender, and swim with little or no tail movement like the banded pufferfish: bluehead, clown wrasse, slippery dick, and yellowhead wrasse. None have the bandtail puffer's combination of dark upper body and white lower body with a dark stripe except the slippery dick. The white markings on the upper body of the initial phase slippery dick are bars, not spots and short lines like the puffer's. The juvenile and terminal phase slippery dicks have no white markings on their upper bodies, and none of the slippery dick black lines turn into dots towards the tail.

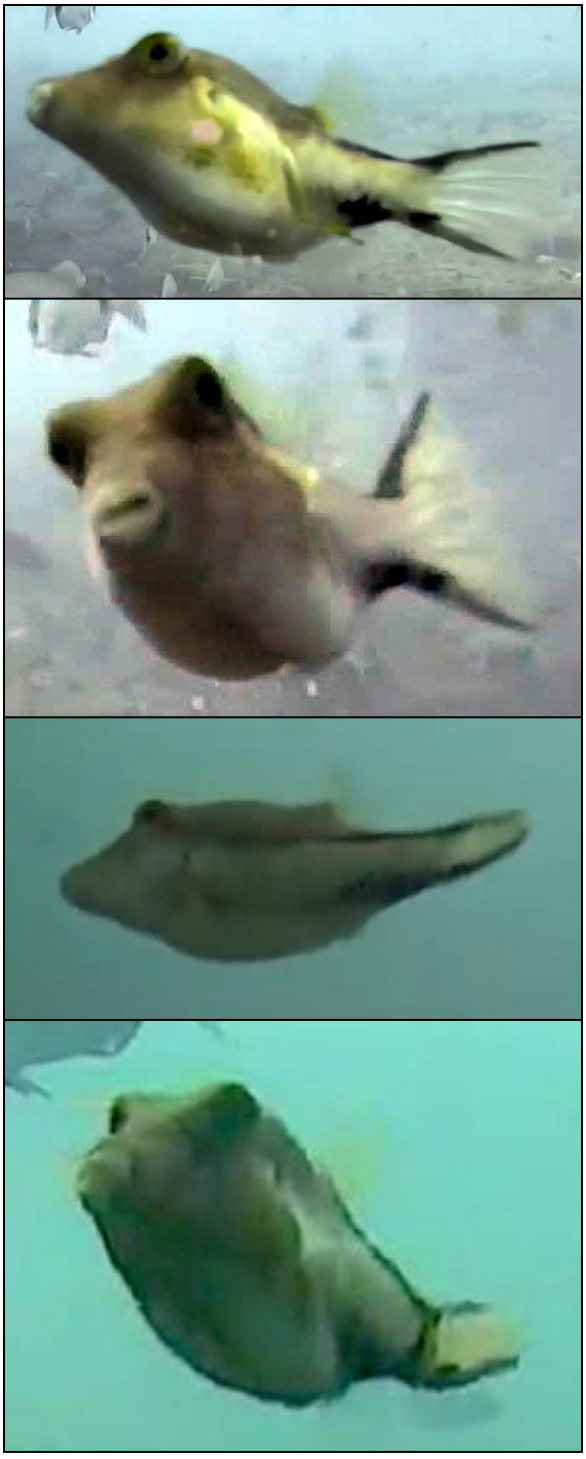
Sharpnose Puffer

***Canthigaster rostrata* (Bloch, 1786)**
Tetraodontidae

Distinguishing characteristics:
The sharpnose puffer is a small fish, 2 to 3 inches long (3–8 centimeters) that swims using primarily its dorsal and anal fins with little or no tail movement. Because they are small and move rapidly, the swimming fins are likely to be invisible on SharkCam except when a specimen approaches the camera closely. The body is stout, oval-shaped, with a pointed head and a sharp snout in front of a rounded belly. The body is dark toned on top with a wide white stripe that runs from the eye to the end of the tail. The tail is carried closed and has a dark edge on the top and bottom.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: No other fish seen on SharkCam is shaped or marked like the sharpnose puffer.



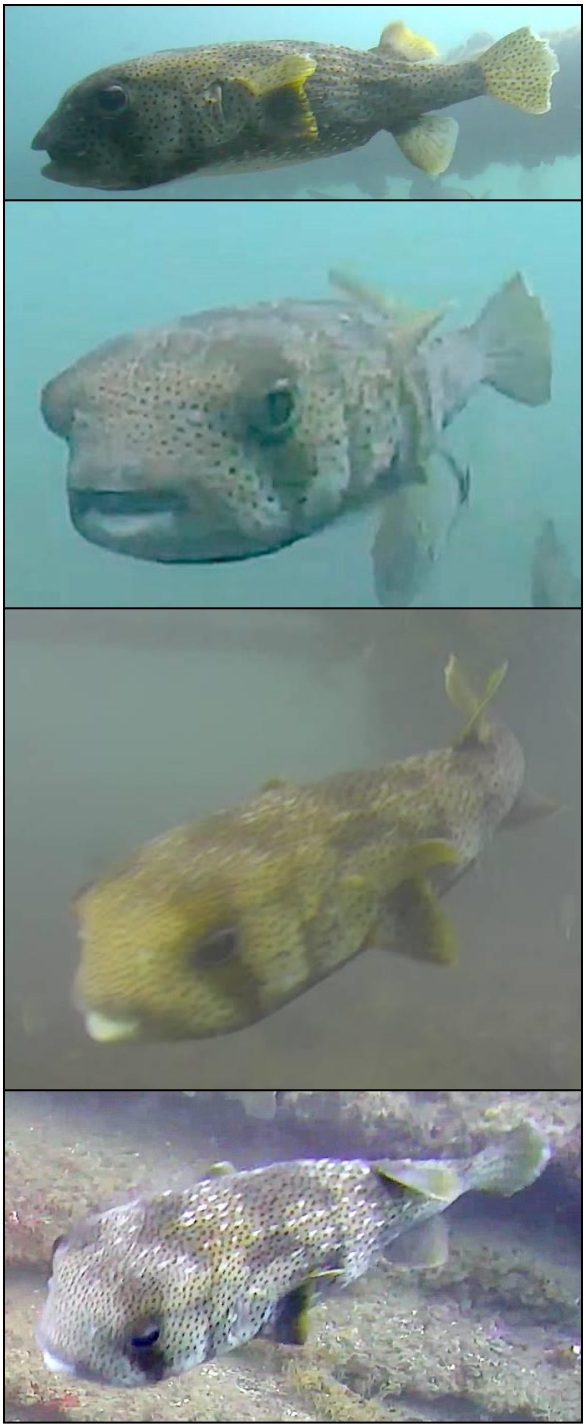
Spot-fin Porcupinefish

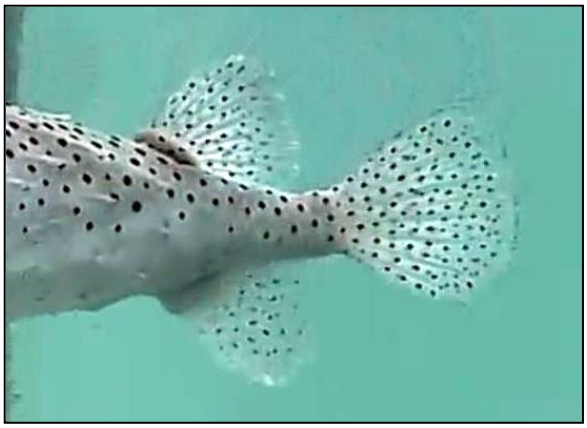
***Diodon hystrix* Linnaeus, 1758**
Diodontidae

Distinguishing characteristics:
The spot-fin porcupinefish is a slow-moving fish with a large head and large bulbous eyes. The mouth is usually agape. The head is the thickest part of the body, which is unusual among fishes. In good lighting, small black spots cover the grayish-tan body and fins. Indistinct darker blotches are present on the body, above, and below the eye. Fin placement is also unusual compared to most other SharkCam fishes. A single dorsal fin is placed far back on the body near the beginning of the caudal peduncle. The anal fin is larger than the dorsal fin and the pectoral fins are located mid-body. As the common name implies, the body is covered in short, stout spines (modified scales) which are normally held relaxed. They are erected when the animal gulps water and expands.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: No other fish seen on SharkCam looks like the spot-fin porcupinefish.





Scrawled Cowfish

***Acanthostracion quadricornis* (Linnaeus, 1758)**
Ostraciidae

Distinguishing characteristics:
The scrawled cowfish is deep-bodied and somewhat triangular in body cross section. The caudal peduncle is unusually long. A fan-shaped tail fin may be seen although it is often held closed. The dorsal fin begins just forward of the caudal peduncle and appears to have a black blotch at the base of the fin. The mouth is small and located on a pointy snout. They have a pair of spines that appear as horns above the eyes although these are unlikely to be seen on SharkCam unless an individual is close to the camera or silhouetted. An opposite pair of rearward projecting spines is also present, but difficult to distinguish.

In good light, short, wavy, blue lines on a greenish or yellow body may be seen.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Spotted Trunkfish (*Lactophrys bicaudalis*)

Two species of boxfishes have been seen on SharkCam. Both the spotted trunkfish and scrawled cowfish have a similar shape and silhouette. Spotted trunkfish lack the horn-like spines above the eyes of scrawled cowfish. Body coloration and pattern of the spotted trunkfish is distinct, being dominated by a gray body, fine white spots, distinct black blotches, and a white mouth, in contrast to the green-yellow body and wavy lines of blue on the scrawled cowfish.

Spotted Trunkfish **X**

***Lactophrys bicaudalis* (Linnaeus, 1758)**

Ostraciidae

Distinguishing characteristics:
The spotted trunkfish is deep-bodied and triangular in body cross section. The caudal peduncle is noticeably long. A fan-shaped tail fin may be seen although it is often held closed. The dorsal and anal fins begin just forward of the caudal peduncle and each has a black blotch at the base of the fin. The mouth is small, white, and located on a pointy snout.

Coloration on SharkCam has been gray, with prominent black blotches. A black saddle crosses the body at the apex of the back, and another appears behind the opercular opening. Between the blotches are several white spots. In good light, a fine pattern of small white spots may be visible on the flanks, and these are often grouped hexagonally, giving the appearance of a honeycomb pattern.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Scrawled Cowfish (*Acanthostracion quadricornis*)

Two species of boxfishes have been seen on SharkCam. Both the scrawled cowfish and the spotted trunkfish have a similar shape and silhouette. Scrawled cowfish are easily distinguished in good light by the presence of prominent, but small, horn-like spines that project forward above the eyes. Body coloration and pattern of the scrawled cowfish is distinct, being dominated by a green-yellow body and wavy lines of blue, in contrast to the gray body and fine white spots of the spotted trunkfish.

Trumpetfish

***Aulostomus maculatus* Valenciennes, 1837**
Aulostomidae

Distinguishing characteristics:
The trumpetfish is very long and thin with a cylindrical body cross section. The head is long and pipet-like with an upturned mouth. The dorsal and anal fins are mirrored symmetrically. These fins are set very far back on the body, immediately in front of the peg-like caudal peduncle. These fins are not likely to be obvious except on a close approach to SharkCam. Body coloration and pattern are highly variable among individuals, and can change reasonably rapidly. The most common color is a mottled brown, although reddish-brown, all-yellow, and silver-blue morphs also occur. Body patterning on SharkCam has not been apparent, but a close approach may reveal darker lines and fine spots, especially on the rear ¼ of the body.

Frequently the fish will turn vertically in the water with the head oriented down.

Sighted individuals have typically hovered near cover for minutes at a time before drifting away and out of view.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: No other fish seen on SharkCam is as long and thin as the trumpetfish.

Pilotfish

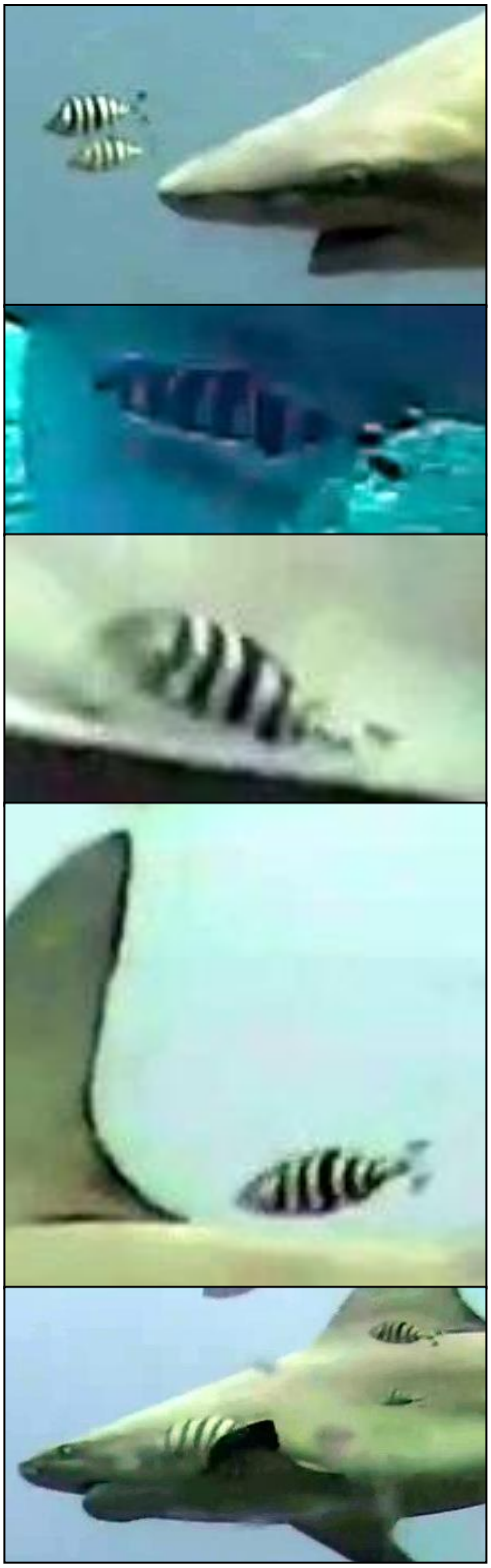
***Naucrates ductor* (Linnaeus, 1758)**
Carangidae

Distinguishing characteristics:
The pilotfish is shaped like an elongated oval and is silvery white with distinct black bars on the body and fins. The tail lobes are rounded with white tips. Pilotfish are most frequently seen closely associated with a shark.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: Juvenile Banded Rudderfish (*Seriola zonata*)

Like the pilotfish, the juvenile banded rudderfish has a series of dark bars across its body and a similarly shaped, jack-like (Carangidae) body. The most reliable distinguishing characteristic of the banded rudderfish is a dark band that runs from its mouth, across its eye, to the front of its dorsal fin, a feature the pilotfish does not have. The eye band and bars coloration tend to be browner on the rudderfish and they fade and disappear with age.



Pilotfish are typically seen associated with sharks. In the top and bottom images, pilotfish are with "Lensy" a sandbar shark *Carcharhinus plumbeus* with a distinctive jaw injury or deformity.

Sharksucker

***Echeneis naucrates* Linnaeus, 1758**
Echeneidae

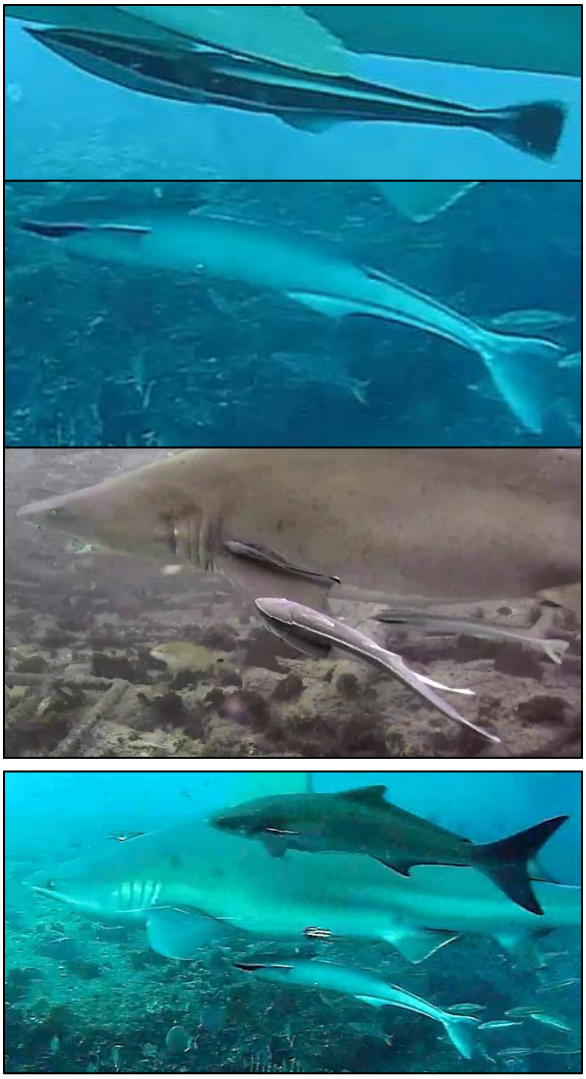
Distinguishing characteristics:
A sharksucker is a long, slender fish most often seen attached to or swimming alongside a larger fish, like a shark. The pectoral fins are angled upward, making it look like the fish is swimming upside down. A young sharksucker's body and fins are dark gray with a wide, black stripe the length of its body. It has a thin, white stripe above and below the black stripe, and white borders on the ends of the dorsal and anal fins and on the top and bottom edges of the tail. As the fish grows older and larger, the dark gray, black, and white tones fade until the fish is light gray with only a white-bordered black mask across the mouth and eyes.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Whitefin Sharksucker (*Echeneis neucratoides*), Cobia (*Rachycentron canadum*)

Young whitefin sharksuckers are distinguished from young sharksuckers by the wider white borders on the sides of their tails.

Cobia are typically much larger and darker than the sharksucker. They too will associate with larger animals, typically rays or turtles, but will often be only loosely associated, as opposed to attached. They share the flattened head, but the sharksucker's head will be noticeably flattened relative to the cobia.



Sharksucker *Echeneis naucrates* (bottom) are similar in shape to cobia *Rachycentron canadum* (top) and both are usually associated with larger nekton, like this sandbar shark *Carcharhinus plumbeus*.

NOTE: In addition to the potential for confusion by having "sharksucker" and "whitefin sharksucker" be different species, the young are often referred to collectively as "sharksucker" because they are difficult to distinguish from each other. Sharksuckers and whitefin sharksuckers have been seen attached to or closely associated with sharks of multiple species, great barracuda, gag, crevalle jack, greater amberjack, almaco jack, cubera snapper, and Atlantic spadefish.

Whitefin Sharksucker

***Echeneis neucratoides* Zuiew, 1789**
Echeneidae

Distinguishing characteristics:
A whitefin sharksucker is a long, slender fish most often seen attached to or swimming alongside a larger fish, like a shark. The pectoral fins are angled upward, making it look like the fish is swimming upside down. The body and fins are dark gray with a wide, black stripe the length of its body and white borders on the stripe, the ends of the dorsal and anal fins, and the top and bottom edges of the tail.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Sharksucker (*Echeneis naucrates*), Cobia (*Rachycentron canadum*)

Young whitefin sharksuckers are distinguished from young sharksuckers (*Echeneis naucrates*) by the wider white borders on the sides of their tails. Sharksuckers tend to be more lightly colored, appearing grayer than the typical black of the whitefin sharksucker.

Cobia are typically much larger than the whitefin sharksucker. They too will associate with larger animals, typically rays or turtles, but will be only loosely associated, as opposed to attached. They share the flattened head, but the whitefin sharksucker's head will be noticeably flattened relative to the cobia.

NOTE: In addition to the potential for confusion by having "sharksucker" and "whitefin sharksucker" be different species, the young are often referred to collectively as "sharksucker" because they are difficult to distinguish from each other. Sharksuckers and whitefin sharksuckers have been seen attached t or closely associated with sharks of multiple species, great barracuda, gag, crevalle jack, greater amberjack, cubera snapper, and Atlantic spadefish.

Bottom Fishes (15)

Basses–Serranidae
- Belted Sandfish
- Harlequin Bass

Drums–Sciaenidae
- Cubbyu

Scorpionfishes–Scorpaenidae
- Red Lionfish
- Spotted Scorpionfish

Blennies–Labrisomidae
- Saddled Blenny

Combtooth Blennies–Blenniidae
- Seaweed Blenny

Lefteye Flounders–Paralichthyidae
- Southern Flounder

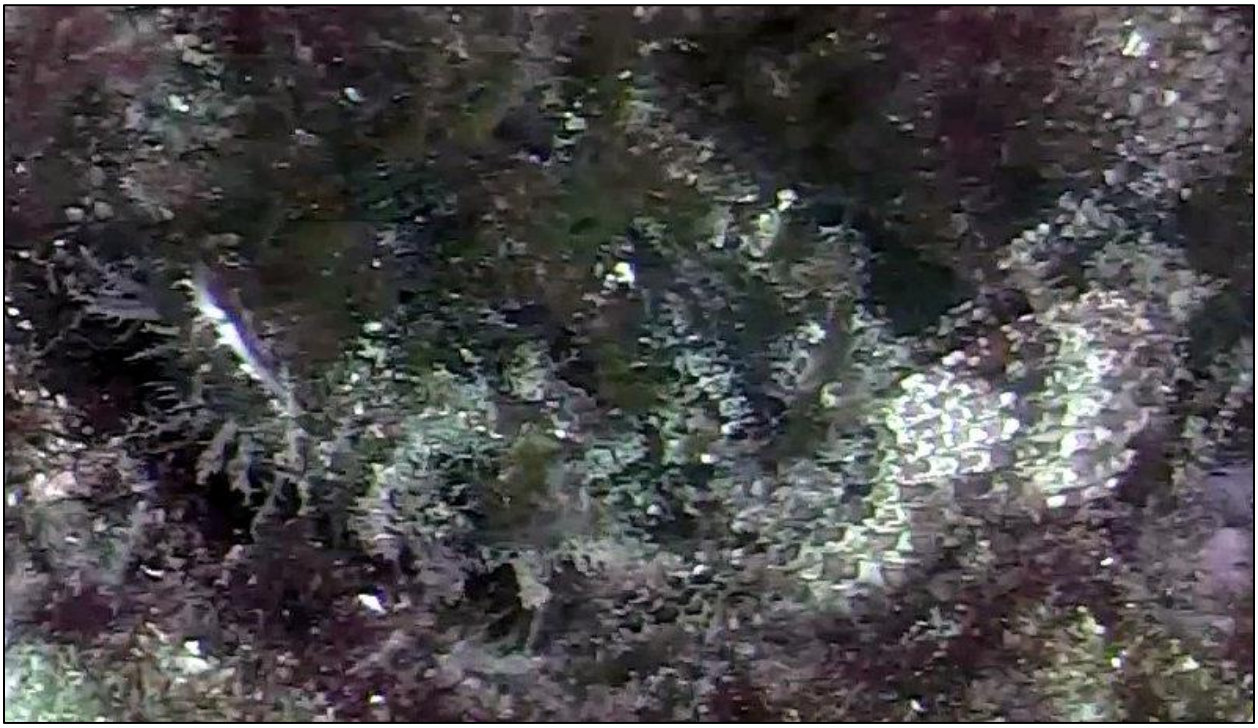
Goatfishes–Mullidae
- Spotted Goatfish
- Yellow Goatfish

Squirrelfishes–Holocentridae
- Squirrelfish

Moray eels–Muraenidae
- Purplemouth Moray
- Spotted Moray

Snake eels–Ophichthidae
- Sharptail Eel

Toadfishes–Batrachoididae
- Oyster Toadfish



Spotted scorpionfish *Scorpaena plumieri* are masters of camouflage. Their color, pattern, and even skin texture mimics their surroundings and often renders them invisible unless movement is seen. Image credit: Explore.org/irwinamy43

Belted Sandfish

***Serranus subligarius* (Cope, 1870)**
Serranidae

Distinguishing characteristics:
From the side, the belted sandfish is triangular and dark colored with a strongly contrasting white belly patch. Depending on how dark the fish is, several darker bars may be seen. The darkest bar is triangular, widest at the top, and is located behind the white belly patch. The fish has large pectoral fins and all fins are finely spotted. A slightly slanted dark line runs through the eye.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: No other fish seen on SharkCam resemble belted sandfish.

Harlequin Bass

***Serranus tigrinus* (Bloch, 1790)**
Serranidae

Distinguishing characteristics
The harlequin bass is a small fish, typically less than 6 inches long, that generally stays near the bottom and will hover motionless for periods of time. The fish has an elongated (tubular) body and a sharply pointed head. The body is white, with the bottom half sometimes showing yellow, and has dark bars. Bars on the bottom half often line up with the light-colored portions of the top half of the body.

Harlequin bass are often seen in pairs.

NOTE: Harlequin bass are simultaneous hermaphrodites and pair-bonding is believed to be related to cooperative foraging and reproduction. See Pressley (1981) for additional information.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ Small (10–20 cm or 4–8 in)

Similar species: No other fish seen on SharkCam resembles harlequin bass.

The bottom image is a dorsal view.

Cubbyu

***Pareques umbrosus* (Jordan and Eigenmann, 1889)**
Sciaenidae

Distinguishing characteristics:
The cubbyu is an all-dark, bottom-dwelling fish that is usually seen in small groups. The body shape is asymmetric, with the high point of the back forward of the body center (over pectoral fin). The first dorsal fin, when raised, is distinctly taller than the second and is separated from the second by the width of the first.

A group of cubbyu is frequently seen by SharkCam maintenance divers under the ledge below the camera installation.

NOTE: Identification as a cubbyu and not a dark variation of a highhat (*Pareques acuminatus*), another drum, is based on close observation during dives at Frying Pan Tower.

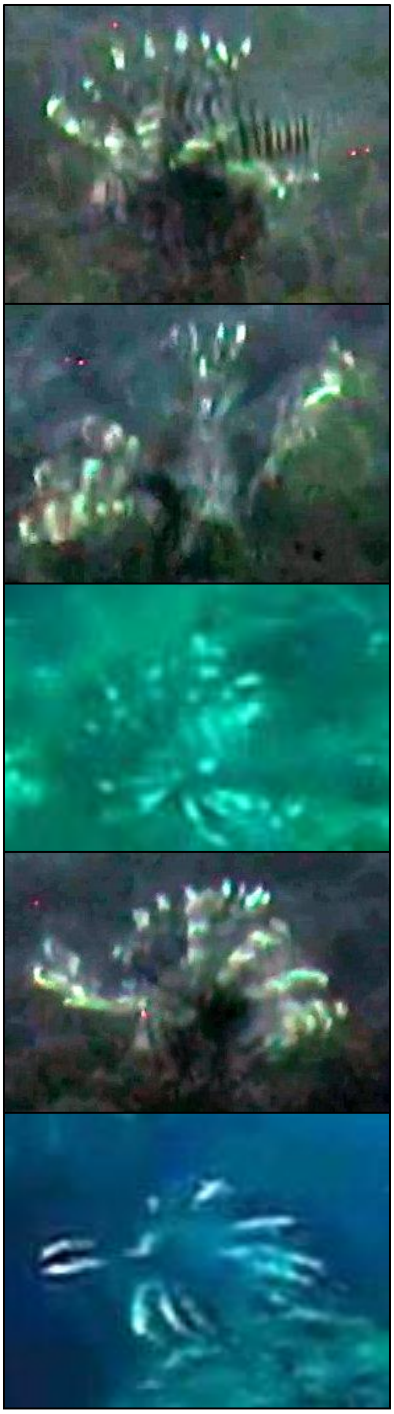
Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Whitespotted Soapfish (*Rypticus maculatus*)

The whitespotted soapfish is a similarly all-dark fish that is frequently seen at the bottom. The soapfish tends to be more solitary than the cubbyu and lacks the distinctive first dorsal fin of the cubbyu.

Red Lionfish

***Pterois volitans* (Linnaeus, 1758)**
Scorpaenidae



Distinguishing characteristics:
The red lionfish dorsal and pectoral fins look like bunches of long, white feathers marked with dark bands across their width. The white-tipped "feathers" can spread out in all directions, obscuring and breaking up the silhouette of the body. The "red" in the red lionfish name comes from brownish-red bars on the light-colored body and fins. Only a close approach is likely to reveal these patterns and colors.

The fish is a bottom dweller and, when stationary, is almost impossible to distinguish on SharkCam from bottom vegetation. Only when the fish is swimming or being moved about by wave action (it is a weak swimmer) does the mobile collection of white-tipped "feathers" catch the eye. Larger individuals tend to be darker and less patterned (an alternate common name for the red lionfish is zebrafish) than the small fish seen so far on SharkCam.

NOTE: Red lionfish are not native to the Atlantic Ocean and are considered an invasive species that poses a threat to native reef fishes. See this video (https://youtu.be/PFml7vARsMk) for an example of predation behavior by lionfish. Please report SharkCam sightings of red lionfish by making a comment on the SharkCam forum.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Another species of invasive lionfish, *Pterois miles*, also occurs at very low frequencies in North Carolina waters. *Pterois volitans* and *P. miles* are visually indistinguishable and most researchers do not attempt to separate them within the invasive range. No other fish seen on SharkCam resembles the red lionfish.

Spotted Scorpionfish

***Scorpaena plumieri* Bloch, 1789**
Scorpaenidae

Distinguishing characteristics:
The spotted scorpionfish is a heavy-bodied fish that spends most of its time lying on the bottom, blending in with its surroundings using a combination of dark and light bars, spots, and mottling, and an ability to change color. This fish is highly camouflaged, and the skin is often ornamented with fleshy plumes (called cirri) especially above the eyes and under the chin. It has a large head and its light-colored tail has three dark bars. The inside base of its pectoral fins have a black patch with brilliant white spots likely to be seen only when the pectoral fins are fanned fully open while moving.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Oyster Toadfish (*Opsanus tau*)

Both the spotted scorpionfish and oyster toadfish are heavyset and large-headed bottom fish with mottled camouflage coloring and large jaws. They share cirri, especially on the head and under the jaw, and large pectoral fins. Both spread their pectoral fins conspicuously while swimming. The spotted scorpionfish's tail is light-colored with three dark bars, and the inside of its pectoral fins have a black patch with bright white spots; the oyster toadfish lacks these features. The oyster toadfish has a flatter head, wider-set eyes, and wider body than the spotted scorpionfish. While the spotted scorpionfish has the ability to change color, it tends toward shades of red or even magenta, while the oyster toadfish is exclusively shades of brown and yellow.

Oyster Toadfish

***Opsanus tau* (Linnaeus, 1766)**
Batrachoididae




Distinguishing characteristics:
The oyster toadfish is a heavy-bodied fish found on the seafloor, nearly always inside a crevice or under a ledge. Its head is extremely large compared to the rest of the body, with bulging eyes, and fleshy, tassel-like appendages (called cirri) on the cheeks and jaws. Its body is a mottled olive-yellow-brown with dark patches and saddles. The pectoral fins are very large and rounded with alternating light yellowish and dark stripes. Seen from above, the fish is very wide-set, while from the side it is fairly flat.

When it infrequently moves, the swimming style is sinuous.

NOTE: Male toadfish make a distinctive "foghorn" or "boat-whistle" sound to attract a mate. This sound is frequently heard by divers even when the fish is not seen.

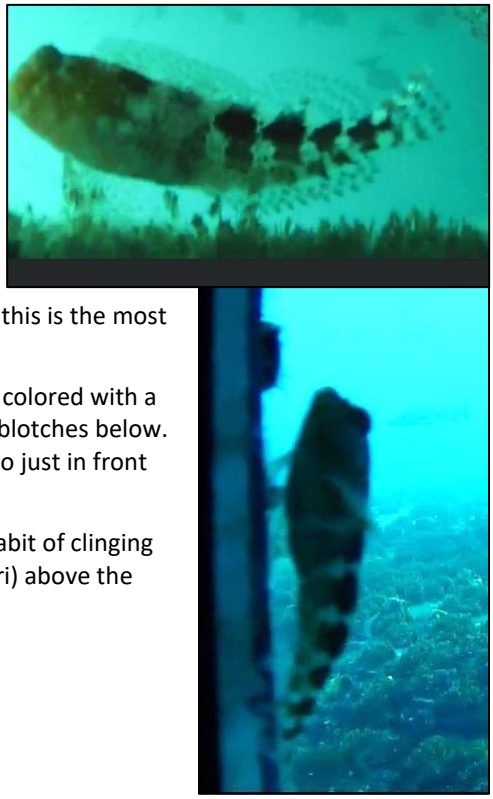
Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Spotted Scorpionfish (*Scorpaena plumieri*)

Both the oyster toadfish and spotted scorpionfish are heavyset and large-headed bottom fish with mottled camouflage coloring and large jaws. They share cirri, especially on the head and under the jaw, and large pectoral fins. Both spread their pectoral fins conspicuously while swimming. The spotted scorpionfish's tail is light-colored with three dark bars, and the inside of its pectoral fins have a black patch with bright white spots; the oyster toadfish lacks these features. The oyster toadfish has a flatter head, wider-set eyes, and wider body than the spotted scorpionfish. While the spotted scorpionfish has the ability to change color, it tends toward shades of red or even magenta, while the oyster toadfish is exclusively shades of brown and yellow.

Saddled Blenny

***Malacoctenus triangulatus* Springer, 1959**
Labrisomidae



Imaged rotated (top); typical natural position (bottom)

Distinguishing characteristics:
Blennies have modified pelvic fins that enable them to "walk" on the bottom and climb things. A SharkCam saddled blenny uses its pelvic fins to cling head up or head down on the side of the camera cleaning bar and, less frequently, the camera glass housing. Because it is so small, less than 3 inches long (about 7.5 centimeters), this is the most frequent way that a saddled blenny will be seen on SharkCam.

Its body tapers from a blunt, bulbous head down to its tail and is light colored with a series of dark blotches along its upper side and smaller, lighter toned blotches below. The dorsal fins are continuous from above the operculum (gill cover) to just in front of the tail fin. The anal fin is lightly speckled.

Close inspection, which is common because of the saddled blenny's habit of clinging to the cleaning bar and dome, will reveal the lack of bristly combs (cirri) above the eyes.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits

Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Seaweed Blenny (*Parablennius marmoreus*)

The seaweed blenny is very similar in size and silhouette to the saddled blenny. They can be readily distinguished from the saddled blenny by the cirri between the eyes of the seaweed blenny and thin bars, not spotting, on its anal fin.

Seaweed Blenny

***Parablennius marmoreus* (Poey, 1876)**
Blenniidae

Imaged rotated (top); typical natural position (bottom)

Distinguishing characteristics:
Blennies have modified pelvic fins that enable them to "walk" on the bottom and climb things. A SharkCam seaweed blenny uses its pelvic fins to cling head up or head down on the side of the camera cleaning bar and, less frequently, the camera glass housing. Because it is so small, less than 3 inches long (about 7.5 centimeters), this is the most frequent way that a seaweed blenny will be seen on SharkCam.

Its body tapers from a blunt, bulbous head down to its tail and checker boarded with a series of alternating dark and light patterns along its upper side, and smaller, often paired, spots below. The dorsal fins are continuous from above the operculum (gill cover) to just in front of the tail fin. The anal fin will often show closely spaced dots arranged in thin bars.

Close inspection, which is common because of the seaweed blenny's habit of clinging to the cleaning bar and dome, will reveal the presence of bristly combs (cirri) above the eyes.

NOTE: Seaweed blennies are often seen by maintenance divers at Frying Pan Tower. They often mimic the background color of the small spaces they inhabit, and they have been seen in color patterns that do not match the images shown. A commonly seen individual was present when SharkCam was rotated in an upright position above the beam. Most installations of SharkCam are (and have been) below the beam, making seaweed blennies rarely seen in this configuration.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Saddled Blenny (*Malacoctenus triangulatus*)

The saddled blenny is very similar in size and silhouette to the seaweed blenny. They can be readily distinguished from the seaweed blenny by the lack of cirri between the eyes of the saddled blenny and spotting, not bars, on its anal fin.

Spotted Goatfish

***Pseudupeneus maculatus* (Bloch, 1793)**
Mullidae

Distinguishing characteristics:
From the side, the spotted goatfish is shaped like an elongated oval that is light colored, has a deeply forked tail, and has three large, dark blotches along its side (the dark eye can look like a fourth blotch).

The goatfish is often seen rooting around on the bottom, stirring up sediments in the hopes of catching a hidden tidbit. Several species, including the bar jack, yellowtail snapper, and black sea bass, have been observed waiting to see whether rooted-up prey escapes the goatfish.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Yellow Goatfish (*Mulloidichthys martinicus*)

The silhouettes of the yellow and spotted goatfish are nearly identical. However, the yellow goatfish is readily distinguishable from the spotted goatfish by the bright yellow tail and mid-body stripe, and the lack of distinct blotches along the side of the spotted goatfish. Yellow goatfish will never show mid-body blotches, nor will spotted goatfish have an all yellow tail.

Yellow Goatfish

***Mulloidichthys martinicus* (Cuvier in Cuvier and Valenciennes, 1829) Mullidae**

Distinguishing characteristics:
From the side, the yellow goatfish is an elongated oval with a deeply forked tail that has pointed lobes. The body is light colored with an entirely yellow tail and a yellow stripe of uniform thickness that extends towards the eye. The eye is relatively large and set well forward on a relatively short head with a rounded forehead. Two long barbels, whisker-like fingers, can be seen on the chin and used to root in the bottom for food.

As seen by divers, yellow goatfish are frequently in small groups over sandy areas near SharkCam, however, sightings on SharkCam have thus far been only of single individuals.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Spotted Goatfish (*Pseudupeneus maculatus*), Yellowtail Snapper (*Ocyurus chrysurus*), Horse-eye Jack (*Caranx latus*)

The silhouettes of the spotted and yellow goatfish are nearly identical. However, the spotted goatfish is readily distinguishable from the yellow goatfish by the presence of distinct blotches along the side of the spotted goatfish. Yellow goatfish will never show mid-body blotches, nor will spotted goatfish have an all yellow tail.

The yellowtail snapper is superficially very similar to the yellowtail goatfish. Both possess an elongated oval-shaped body, a yellow tail, and a yellow stripe that extends up the body. However, the yellowtail snapper's mid-body yellow stripe narrows as it moves toward the head. The eye is medium sized, and the head ends in a pointed snout, unlike the rounded forehead of the yellow goatfish. Behaviorally, the yellowtail snapper will always be in motion and typically not closely associated with the bottom. In contrast, the goatfish will be strongly bottom associated, and exhibit frequent starts and stops as it forages.

A horse-eye jack has a similarly deeply forked yellow tail with pointed lobes, like the yellow goatfish, but the horse-eye jack is much larger, with a much deeper body, silver-gray body coloring, and no yellow stripe extending forward towards the eye. Instead, the horse-eye jack has a narrow dark stripe that runs from the tail about halfway to the mouth, and it has a noticeably large eye.

Except for the spotted goatfish, all similar species lack the two barbels that are seen on the chin.

Squirrelfish

***Holocentrus adscensionis* (Osbeck, 1765)**
Holocentridae

Distinguishing characteristics:
From the side, SharkCam squirrelfish is shaped like an oval with moderately long and wavy fins and lobes of a deeply forked tail. The body varies from light to dark tones, and in good lighting shows a largely pink body with yellow and white stripes, and white fins, except the dorsal fin which is typically bright yellow. A white saddle may show, extending down from the rear of the dorsal fin.

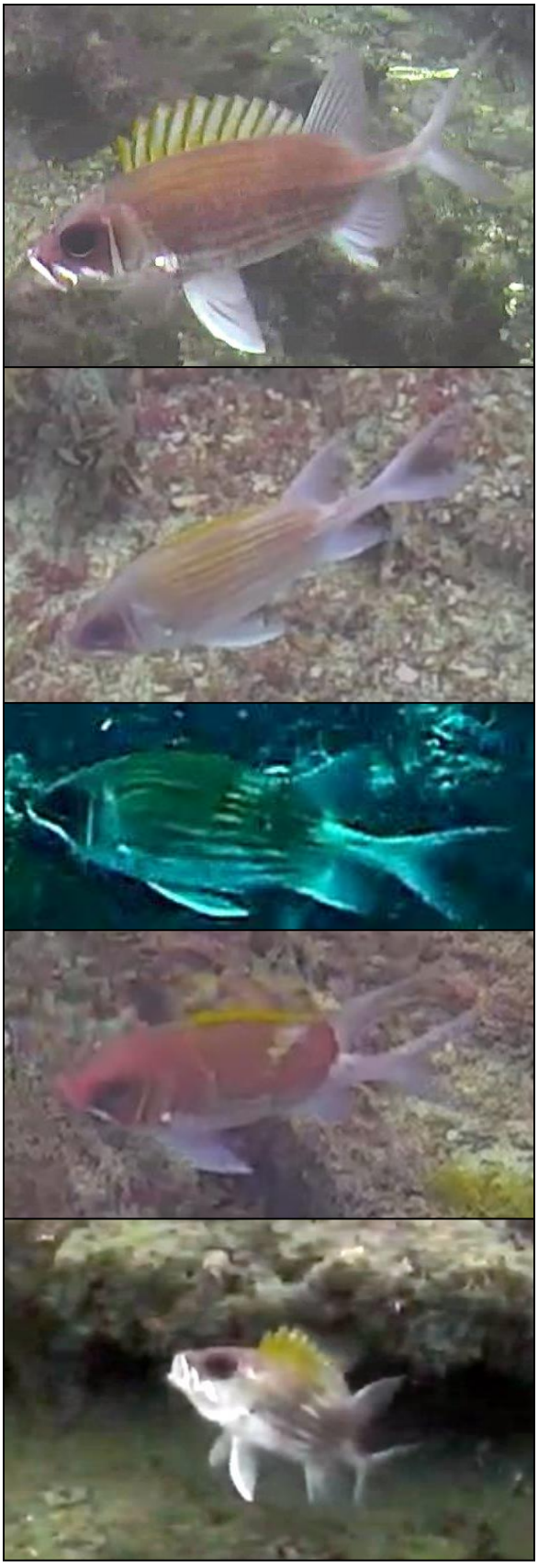
Close to the camera large scales may be apparent. The eye is large and dark red which are adaptations for nighttime vision.

Squirrelfish will usually be closely associated with the bottom and near or under overhanging cover. They are nocturnal feeders and tend to be shy.

NOTE: Squirrelfish appear to use the same shelters for long periods of time (weeks to months). For example, a squirrelfish nicknamed “Tuffty” is frequently seen when the camera focuses on the small ledge that is part of the auto-tour for SharkCam.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: No other fish seen on SharkCam resembles the squirrelfish.



“Tuffty” emerging from the small ledge where a squirrelfish was frequently seen in 2019

Southern Flounder

***Paralichthys lethostigma* Jordan and Gilbert in Jordan and Meek, 1884 Paralichthyidae**

Distinguishing characteristics:
The southern flounder is a flatfish that is likely to only be seen if close to the camera and moving. Although it is relatively large, its ability to mimic the background color and pattern of the bottom renders it nearly invisible when motionless. The upper (visible) side of the body appears dark with mottled light and dark spots, and if close to the camera, two protuberant eyes on a sharply triangular head may be visible. The tail fin is typically half as wide as the deepest part of the bottom and the tail edge will be relatively flat or peaked.

Relative frequency: ● Rare–seen in less than 1% of visits.

NOTE: Southern flounder are typically found in coastal and inshore waters until late fall when they migrate offshore to overwinter.

Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: No other fish seen on SharkCam resembles the southern flounder.

A pair of southern flounder were frequently seen together in early March 2021.

Purplemouth Moray

***Gymnothorax vicinus* (Castelnau, 1855)**
Muraenidae

Distinguishing characteristics:
The purplemouth moray is a long, slender fish, heavier bodied (bigger around) and longer than most eels. Color on camera is dark greenish-brown but may show a brownish-purple tint under good lighting. The body lacks obvious markings or patterns. The eye has a golden iris that will only be visible on a close approach or if zoomed in.

The purplemouth moray rests during the day in a crevice or under a ledge, often with part of its body sticking out. The mouth opens and closes continually to pump water across its gills.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ ◌ Large (0.5–1 m or 20–39 in) to Very large (>1 m or >39 in)

Similar species: Spotted Moray (*Gymnothorax moringa*), Sharptail Eel (*Myrichthys breviceps*)

The only other eels seen on SharkCam have been the spotted moray and sharptail eel. The purplemouth moray lacks markings on its skin, while the "spots" of the spotted moray are indistinct, unlike the sharptail eel, which has white spots on a dark body. The body diameter of the sharptail eel is relatively uniform, unlike the tapered form of the spotted and purplemouth morays.

Spotted Moray

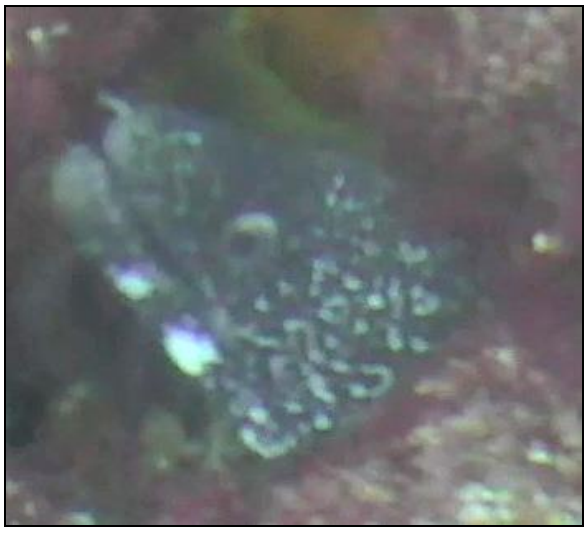
***Gymnothorax moringa* (Cuvier, 1829)**
Muraenidae

Distinguishing characteristics:
The spotted moray is a long, slender fish, heavier bodied (bigger around) and longer than most eels. The body is pale colored but is covered with so many dark colored spots and blotches that it almost like the reverse, a dark body covered with white blotches. The body is compressed laterally, meaning that from the front it is shaped like an oval. Close up it shows large white spots on its lower jaw. The mouth opens and closes continually to pump water across its gills.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Purplemouth Moray (*Gymnothorax vicinus*), Sharptail Eel (*Myrichthys breviceps*)

The purplemouth and spotted morays have similar heavy bodies but the purplemouth moray has no obvious markings and appears more robust than the spotted moray. The sharptail eel is much more slender than the purplemouth or spotted moray and it has distinct white spots arranged in a row along its body.



Sharptail Eel

***Myrichthys breviceps* (Richardson, 1848)**
Ophichthidae

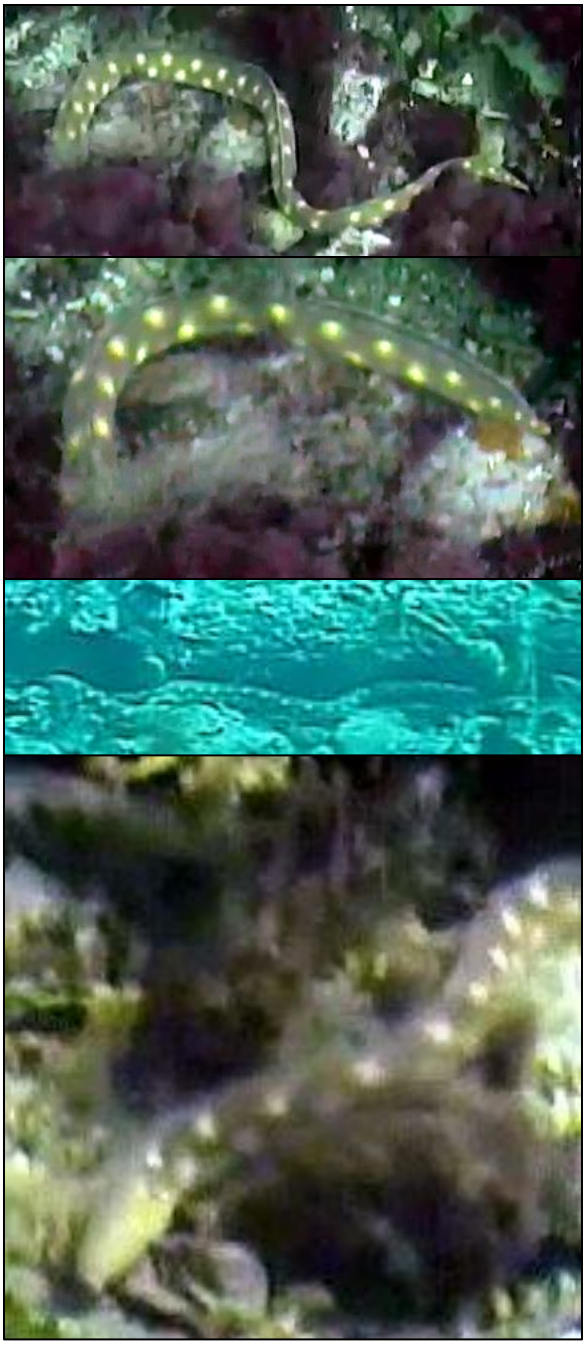
Distinguishing characteristics:
The sharptail eel is snakelike in appearance: a long, slender, tube-shaped fish that undulates along the bottom. The eel has a greenish-gray body and light-colored spots along its entire length except on the head. The snout has two tubular nostrils that project forward, but these are unlikely to be seen except on a close approach.

When seen it will be traveling, frequently stopping to poke its head into cracks and crevices in search of prey. The entire body may disappear and then reappear nearby.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ Large (0.5–1 m or 20–39 in)

Similar species: Purplemouth Moray (*Gymnothorax vicinus*), Spotted Moray (*Gymnothorax moringa*)

The only other eels seen on SharkCam have been the purplemouth moray and spotted moray. The purplemouth moray lacks markings on its skin, while the "spots" of the spotted moray are indistinct, unlike the sharptail eel. Both morays are much more stoutly bodied than the sharptail eel, and much less likely to be seen out and moving away from their den. When under cover the opening and closing of a moray's mouth is usually apparent.



The sharptail eel's head is not visible in the first three images.

Not Fishes (14)

Box jellyfishes–Alatinidae (Phylum Cnidaria, Class Cubozoa)
- Sea Wasp

Comb jellies–Bolinopsidae (Phylum Ctenophora, Class Tentaculata)
- Warty Comb Jelly

Rock crabs–Cancridae (Phylum Arthropoda, Class Malacostraca)
- Jonah Crab

Sea turtles–Cheloniidae (Phylum Chordata, Class Reptilia)
- Green Sea Turtle
- Loggerhead Sea Turtle

Loons–Gaviidae (Phylum Chordata, Class Aves)
- Common Loon

Apes–Hominidae (Phylum Chordata, Class Mammalia)
- Human (Freediver and Scuba Diver)

Pencil Squids–Loliginidae (Phylum Mollusca, Class Cephalopoda)
- Inshore Squids

Octopuses–Octopodidae (Phylum Mollusca, Class Cephalopoda)
- Atlantic Longarm Octopus
- Common Octopus

Spiny lobsters–Palinuridae (Phylum Arthropoda, Class Malacostraca)
- Caribbean Spiny Lobster

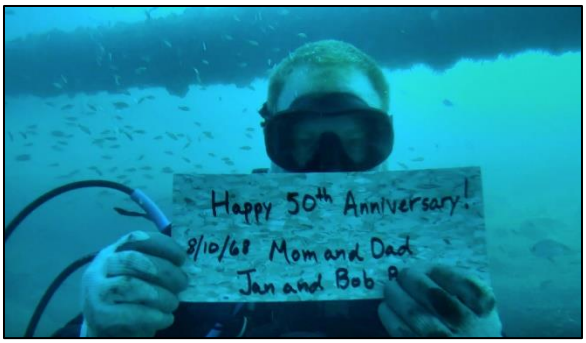
Swimming crabs–Portunidae (Phylum Arthropoda, Class Malacostraca)
- Blotched Swimming Crab

Globular sea urchins–Toxopneustidae (Phylum Echinodermata, Class Echinoidea)
- West Indian Sea Egg

Jellyfishes–Ulmaridae (Phylum Cnidaria, Class Scyphozoa)
- Moon Jelly

As this category name implies, this section contains animals that aren't fish, but they are notable on camera because they are mobile and often large or obvious. This list does not include any of the epibenthic (attached to the bottom) organisms, such as macroalgae, sponges, sessile cnidarians (hydroids and soft corals), or tunicates which are ubiquitously visible from the camera. The epibenthos are often notoriously difficult to identify visually and barring field collections we are not likely to add any of them to the guide.

A loggerhead sea turtle *Caretta caretta* passes (background) by a sand tiger shark *Carcharias taurus* (foreground). Image credit: Explore.org/Erin Burge



Erin Burge was on Frying Pan Tower for solar installation and SharkCam maintenance and left a message for his parents. Image credit: Explore.org

Human (Freediver and Scuba Diver)

***Homo sapiens* "*aquaticus*"**
***Homo sapiens* "*scubica*"**
Hominidae (Phylum Chordata, Class Mammalia)

Distinguishing characteristics:
Human divers seen on SharkCam come in two types, scuba and free. Both types come in a variety of colors, although black is most common.

Scuba divers can be distinguished by their blocky backs, due to one or two air tanks, and the bubbles that emanate from their head ends.

Freedivers lack tanks and bubbles, and will be carrying less equipment.

Frequently both types will carry a large speargun and appear to be friendly, frequently waving at the camera. Scuba types can be further categorized as recreational or (camera) maintenance. Freedivers appear to be only recreational.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Human divers are unlikely to be mistaken for anything else swimming around on SharkCam.

Common Loon

***Gavia immer* (Brunnich, 1764)**
Gaviidae (Phylum Chordata, Class Aves)

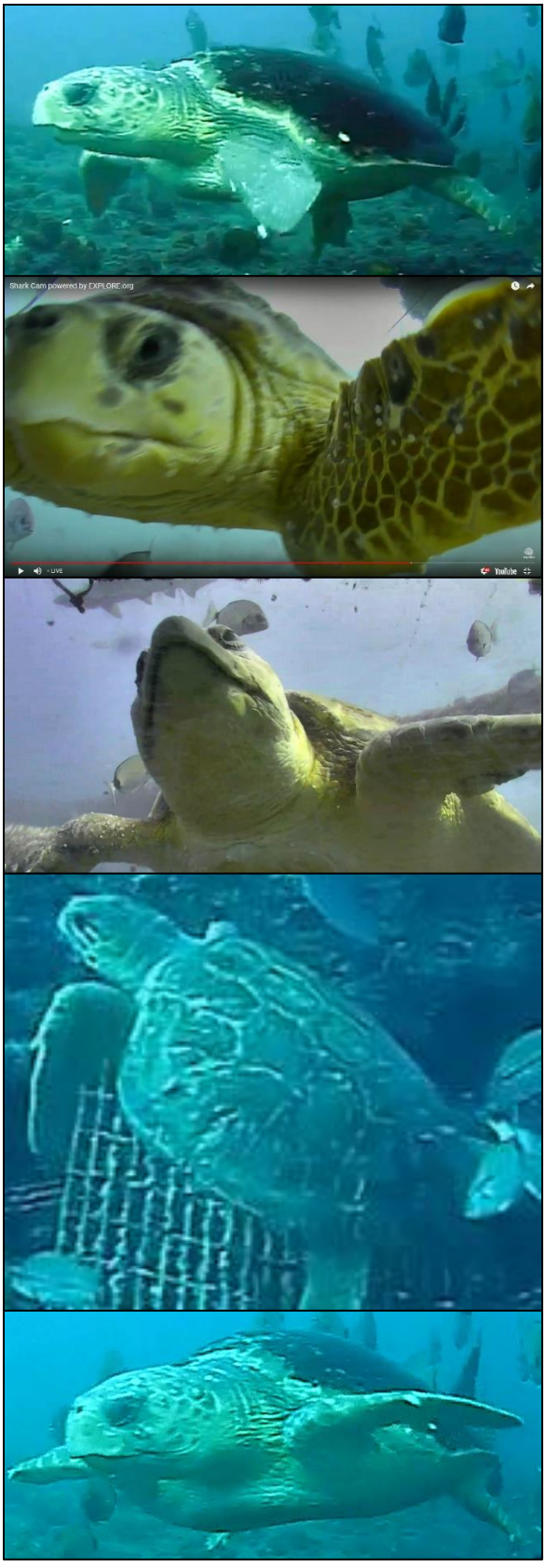
Distinguishing characteristics:
Common loons are diving birds that swim like ducks at the surface and can dive to considerable depths. They dive with their wings folded, using their large webbed feet to swim. Their bodies are torpedo shaped, with a long, snakelike neck and head with a long cone-shaped beak and large eyes. While diving, their feet stick out behind them to paddle them in quick bursts. Underwater, their feathers lay flat against their bodies and they can appear very slender, especially around the head and neck.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Nothing else seen on SharkCam resembles a common loon.

Loggerhead Sea Turtle

***Caretta caretta* (Linnaeus, 1758)**
Cheloniidae (Phylum Chordata, Class Reptilia)



Distinguishing characteristics:
Loggerhead sea turtles seen on SharkCam have all been adults larger than any of the fish except the sharks and rays. The domed upper part of their carapace (bony shells) is longer than it is wide. A good view of the upper carapace will reveal five lateral (costal) scutes. These are the large plates in the second row on either side of the body. Shell color has varied from a mottled gray-green to almost black depending, in part, on the amount of marine growth such as algae and barnacles (light circular bumps). Skin color has ranged from the same mottled gray-green to yellow or almost white. The head is noticeably large with a prominent beak forward of large eyes.

Loggerheads are slow swimmers, using only their front flippers and letting their rear flippers trail behind.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: O O O O O Very large (>1 m or >39 in)

Similar species: Green Sea Turtle (*Chelonia mydas*)

Two species of marine turtles have been seen on SharkCam, the loggerhead and green sea turtles. The loggerhead is distinguished from the green sea turtle by its much larger head with a prominent beak, and the presence of five costal scutes, in contrast to the green sea turtle, which has a petite head, and four costal scutes.

Although both are rare, the loggerhead is much more frequently seen on SharkCam.

Green Sea Turtle

***Chelonia mydas* (Linnaeus, 1758)**
Cheloniidae (Phylum Chordata, Class Reptilia)

Distinguishing characteristics:
The green sea turtle has an oval-shaped carapace (bony shell) and the head is relatively small and blunt. Shell coloration is brown to olive-green. On SharkCam, skin color has been light cream with prominent brown scales. A good view of the upper carapace will reveal four lateral (costal) scutes. These are the large plates in the second row on either side of the body.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: The green sea turtle has only been definitively identified on SharkCam on 29 October 2019, when a small adult or large juvenile was spotted at 2:23PM EDT.

Relative size: ○ ○ ○ ○ ○ Very large (>1 m or >39 in)

Similar species: Loggerhead Sea Turtle (*Caretta caretta*)

Two species of marine turtles have been seen on SharkCam, the green and loggerhead sea turtles. The green sea turtle is distinguished from the loggerhead by its petite head and five costal scutes, compared to the much larger head and prominent beak plus four costal scutes of the loggerhead.

Although both are rare, the loggerhead is much more frequently seen on SharkCam.

West Indian Sea Egg

***Tripneustes ventricosus* (Lamarck, 1816)**
Toxopneustidae (Phylum Echinodermata, Class Echinoidea)

Distinguishing characteristics:
West Indian sea eggs are baseball-sized sea urchins covered with white spines that almost obscure the dark body. In natural lighting, the sea egg body will show purple. A view of SharkCam bottom will usually show several individuals looking like stationary objects. They crawl around too slowly to see movement but a later return to the area will likely show them in different locations.

Relative frequency: ● ● Uncommon–seen in 1% to 10% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Nothing else seen on SharkCam resembles a West Indian sea egg.

Caribbean Spiny Lobster

***Panulirus argus* (Latreille, 1804)**
Palinuridae (Phylum Arthropoda, Class Malacostraca)

Distinguishing characteristics:
Caribbean spiny lobsters look like what people think of when they think of lobsters, but without the big claws. They have a tube-shaped body, a flat tail, and two long, stout, whip-like antennae, and two shorter, thinner antennae between the obvious ones. They crawl around on ten spindly legs.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: A cave adjacent to the sand patch, but not visible on SharkCam, typically has several large lobsters in residence.

Relative size: ○ ○ ○ ◌ Medium (20 cm–0.5 m or 8–20 in) to Large (0.5–1 m or 20–39 in).

NOTE: Caribbean spiny lobsters seen on SharkCam are likely to be very large relative to the diminutive lobster you may have eaten.

Similar species: Nothing else seen on SharkCam resembles a Caribbean spiny lobster.

Blotched Swimming Crab

***Achelous spinimanus* (Latreille, 1819)**
Portunidae (Phylum Arthropoda, Class Malacostraca)

Distinguishing characteristics:
In silhouette, the blotched swimming crab closely resembles the familiar, edible blue crab. The body is covered by a rounded, flattened carapace that is slightly more broad than wide. The claws (chelipeds) are long with darkened tips and fluted, making the claw appear to have alternating light and dark stripes. The rear legs are flattened, especially at the ends, into swimming paddles.

In better lighting, the blotched swimming crab will have a mottled brown carapace with darker brown to orange tips on the chelipeds and walking legs.

Blotched swimming crabs will typically only be seen near shelter or hidden amongst macroalgae or other sessile benthic organisms.

NOTE: Many text and online resources use the alternate scientific names, *Portunus spinimanus*, or *Portunus* (*Achelous*) *spinimanus*, for the blotched swimming crab.

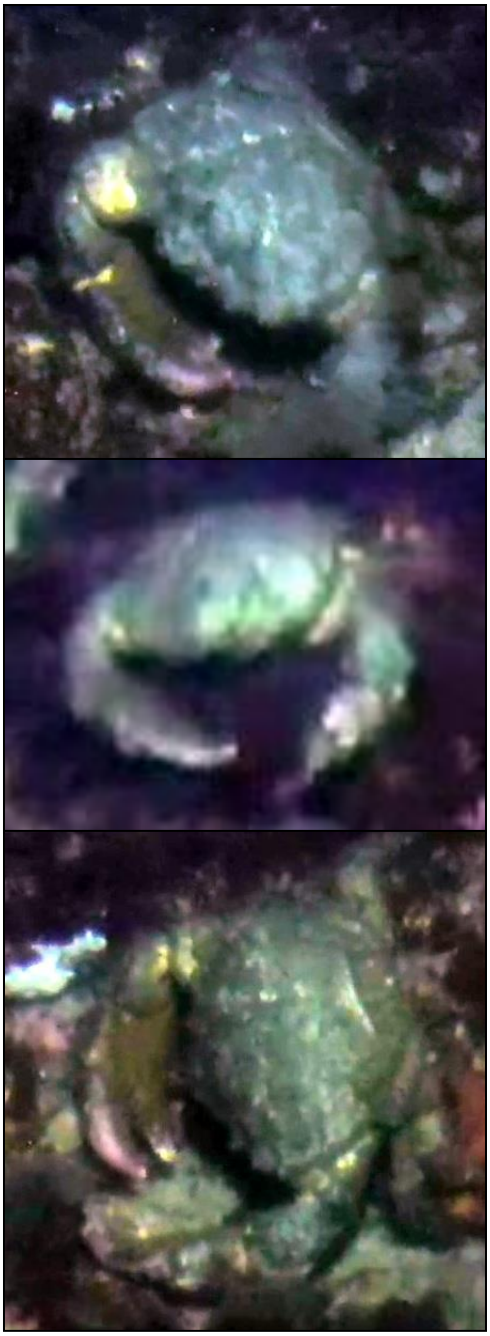
Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Jonah Crab (*Cancer borealis*)

Compared to the Jonah crab, the blotched swimming crab is smaller, slimmer, and with a more elongated carapace. The blotched swimming crab's carapace is almost scallop-shaped with pronounced "teeth" protruding from the front edge compared to the rounded Jonah crab. The long, thin claws of the blotched swimming crab contrast obviously with the bulky Jonah crab claws. Most notably, the Jonah crab lacks the flattened, paddle-like rear legs which the blotched swimming crab uses to swim.

Jonah Crab

***Cancer borealis* Stimpson, 1859**
Cancridae (Phylum Arthropoda, Class Malacostraca)



Distinguishing characteristics:
The Jonah crab is stoutly built, with a round, rough-edged carapace and relatively stout claws. The carapace is typically reddish in color, though it may range from brown to purple. Good lighting may show the dark tips of the claws, as well as a pair of curved, dotted lines on the carapace. The Jonah crab will only be seen hiding on or traversing the seafloor.

NOTE: Identification as the Jonah crab is based on a provisional identification as a *Cancer* sp. crab by David Knott (SERTC) and the relatively massive claws seen on SharkCam.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ Small (10–20 cm or 4-8 in)

Similar species: Blotched Swimming Crab (*Achelous spinimanus*)

Compared to the blotched swimming crab, the Jonah crab is not only larger, but more robust in build, and with a rounder carapace. The Jonah crab claws are bulkier in comparison to the body, compared to the long, thin claws of the blotched swimming crab. The blotched swimming crab's carapace is almost scallop-shaped with pronounced "teeth" protruding from the front edge. Most notably, the Jonah crab lacks the flattened, paddle-like rear legs which the blotched swimming crab uses to swim.

Common Octopus

***Octopus vulgaris* Cuvier, 1797**
Octopodidae (Phylum Mollusca, Class Cephalopoda)




Distinguishing characteristics:
Octopuses have bulbous mantles ("heads") and eight sucker-lined arms of approximately equal length. They move by crawling along the seafloor with their arms or jetting through the water with the arms trailing. Octopuses can be highly variable in color or combinations of colors, and can change these rapidly. They can also change the texture of the skin, so it ranges from smooth to covered in protrusions and bumps. These are used to mimic the texture of its surroundings.

The common octopus is typically mottled with lighter blotches on a darker background. Though it can change color, it is usually found in some shades of reddish-brown to tan, to camouflage with its preferred rocky habitat. The arms are approximately twice the length of the mantle and relatively thick.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ○ Medium (20 cm–0.5 m or 8–20 in)

Similar species: Atlantic Longarm Octopus (*Macrotritopus defilippi*)

Common octopus seen on SharkCam have all been substantially larger than the Atlantic longarm octopus. The common octopus's body is generally more robust compared to the slender arms and mantle of the Atlantic longarm octopus. The common octopus' arms are also shorter (about two times the length of the mantle) than those of the Atlantic longarm octopus (about three to four times the mantle length). Occasionally, expansive webbing will be visible between the arms of the common octopus, while in the Atlantic longarm octopus webbing is only weakly present.

Octopus crawling on the dome of SharkCam

Atlantic Longarm Octopus

***Macrotritopus defilippi* (Vérany, 1851)**
Octopodidae (Phylum Mollusca, Class Cephalopoda)

Distinguishing characteristics:
Octopuses have bulbous mantles ("heads") and eight sucker-lined arms of approximately equal length. They move by crawling along the seafloor with their arms or jetting through the water with the arms trailing. Octopuses can be highly variable in color or combinations of colors, and can change these rapidly. They can also change the texture of the skin, so it ranges from smooth to covered in protrusions and bumps. These are used to mimic the texture of its surroundings.

The Atlantic longarm octopus is a small species. As its name suggests, its arms are relatively long, three to four times the length of the mantle. Though it can change color, it is usually found in some shade of tan or brown, to camouflage with its preferred sandy environment.

Relative frequency: ● Rare–seen in less than 1% of visits

NOTE: An Atlantic longarm octopus has only been seen on SharkCam once. An individual visited with the nighttime light on 24 September 2021 at 8:52PM EDT. Confirmation of the identification as *Macrotritopus defilippi* was provided by Mike Vecchione, Curator of Cephalopoda at the Smithsonian National Museum of Natural History. This species is also known as the lilliput longarm octopus.

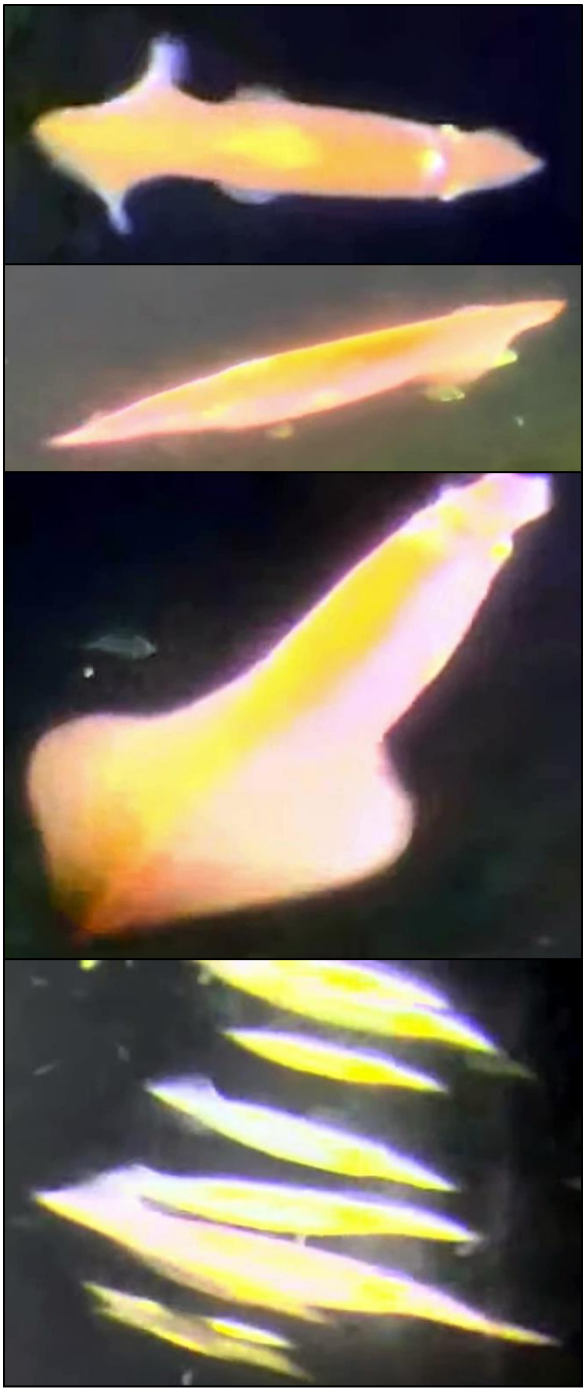
Relative size: ○ ○ Very small (<10 cm or 4 in) to Small (10–20 cm or 4–8 in)

Similar species: Common Octopus (*Octopus vulgaris*)

The Atlantic longarm octopus is substantially smaller than the common octopus, whose body is generally more robust compared to the slender arms and mantle of the Atlantic longarm octopus. The common octopus' arms are also shorter (about two times the length of the mantle) than those of the Atlantic longarm octopus (about three to four times the mantle length). Occasionally, expansive webbing will be visible between the arms of the common octopus, while in the Atlantic longarm octopus webbing is only weakly present.

Inshore Squids (Longfin Inshore Squid and Slender Inshore Squid)

***Doryteuthis pealeii* (Lesueur, 1821)**
***Doryteuthis pleii* (Blainville 1823)**
Loliginidae (Phylum Mollusca, Class Cephalopoda)



Distinguishing characteristics:
Two species of inshore squids occur in the SharkCam region, the longfin and slender inshore squids. They are very difficult to distinguish visually so identification to species is unlikely on SharkCam.

An inshore squid's body is composed of a long, pointed mantle ("upper" section) and a head ("lower" section) comprising the eyes, eight similar small arms, and, in males, two longer tentacles. A pair of fins are positioned at the end of the mantle, which undulate as the squid swims. In the inshore squids, the mantle is about twice as long as the lower section of the body, and the fins extend approximately half the mantle's length. Though squid are capable of sudden and dramatic color changes, the inshore squids tends to range from pale to red-orange.

Inshore squids have only been seen at night with the SharkCam light illuminated.

NOTE: Confirmation of the identification to the genus *Doryteuthis* was provided by Mike Vecchione, Curator of Cephalopoda at the Smithsonian National Museum of Natural History.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Nothing else seen on SharkCam resembles an inshore squid.

Warty Comb Jelly

***Mnemiopsis leidyi* Agassiz, 1865**
Bolinopsidae (Phylum Ctenophora, Class Tentaculata)

Distinguishing characteristics:
Warty comb jellies are transparent to white, gelatinous marine invertebrates superficially similar to jellyfish. They typically have an ovoid or spheroid body with eight distinct stripes of elongated cilia arranged in rows and used for movement. They will generally be moving with the current and turbulence in the water. Light can refract along the closely spaced cilia resulting in a rainbow prismatic effect.

NOTE: This species was provisionally identified as *Beroe ovata* in earlier editions of this guide. Additional sightings and consultations with Dr. Rob Condon (Young Scientist Academy) suggested that the original identification be revised. This species is also sometimes known as the sea walnut.

Relative frequency: ● Rare– seen in less than 1% of visits
Relative size: ○ Very small (<10 cm or 4 in)

Similar species: Moon Jelly (*Aurelia aurita*), Sea Wasp (*Alatina alata*)

While all three "jellies" are translucent and gelatinous, they have distinctly different shapes. The moon jelly is shaped like an upside-down bowl with short, trailing tentacles underneath. The sea wasp is rectangular to ovoid with four distinct tentacles about twice the length of the body. Warty comb jellies are ovoid with eight distinct stripes along the body and they do not possess visible tentacles. Both the moon and warty comb jellies will move relatively passively with the current, while the sea wasp will move with purpose over the distance seen by the camera.

Sea Wasp

***Alatina alata* (Reynaud, 1830)**
Alatinidae (Phylum Cnidaria, Class Cubozoa)

Distinguishing characteristics:
Sea wasps are gelatinous animals with a translucent white, ovoid to rectangular prism-shaped body, the bell, and four white, string-like tentacles, one at each corner of the bell.

They are competent, directional swimmers, and close inspection will show the bell pulsating as they jet water for their movement.

NOTE: Sea wasps are members of the Class Cubozoa, which are known as box jellyfish. They are distinct from "true jellyfish" of Class Scyphozoa.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ◌ Very small (<10 cm or 4 in) to Small (10–20 cm or 4–8 in)

Similar species: Moon Jelly (*Aurelia aurita*), Warty Comb Jelly (*Mnemiopsis leidyi*)

While all three "jellies" are translucent and gelatinous, they have distinctly different shapes. The moon jelly is shaped like an upside-down bowl with short, trailing tentacles underneath. The sea wasp is rectangular to ovoid with four distinct tentacles about twice the length of the body. Warty comb jellies are ovoid with eight distinct stripes along the body and they do not possess visible tentacles. Both the moon and warty comb jellies will move relatively passively with the current, while the sea wasp will move with purpose over the distance seen by the camera.

Moon Jelly

***Aurelia aurita* (Linnaeus, 1758)**
Ulmaridae (Phylum Cnidaria, Class Scyphozoa)

Distinguishing characteristics:
Moon jellyfish are gelatinous animals with translucent white upside-down bowl shapes and a brighter white rim. They swim by opening and closing like an umbrella, and are tumbled around by currents so may be sideways or even upside down. They have short, trailing tentacles around the bell, and a group of longer extensions, oral arms, that extend from under the bell in the center. When viewed from above four opaque, white horseshoe shapes may be visible.

Relative frequency: ● Rare–seen in less than 1% of visits
Relative size: ○ ○ ◌ Small (10–20 cm or 4–8 in) to Medium (20 cm–0.5 m or 8–20 in)

Similar species: Sea Wasp (*Alatina alata*), Warty Comb Jelly (*Mnemiopsis leidyi*)

While all three "jellies" are translucent and gelatinous, they have distinctly different shapes. The moon jelly is shaped like an upside-down bowl with short, trailing tentacles underneath. The sea wasp is rectangular to ovoid with four distinct tentacles about twice the length of the body. Warty comb jellies are ovoid with eight distinct stripes along the body and they do not possess visible tentacles. Both the moon and warty comb jellies will move relatively passively with the current, while the sea wasp will move with purpose over the distance seen by the camera.

APPENDIX 1 – ADDITIONAL INFORMATION AND CONTRIBUTIONS

Alphabetical by common name **Jump to A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

A

Common name: African Pompano
Scientific name: *Alectis ciliaris* (Bloch, 1787)
Family: Carangidae
Similar species: Crevalle Jack (*Caranx hippos*)
Permit (*Trachinotus falcatus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rv54hp5wBQoPDpimsqxnB2
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1243
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/155014/4696428
Additional information:
https://en.wikipedia.org/wiki/African_pompano
http://www.championbass.com/encyclopedia/african_pompano.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-John Rainey, cynde, jon-newbie, Sky Pilot, Zeba Knight; video-jon-newbie

Common name: Almaco Jack
Scientific name: *Seriola rivoliana* Valenciennes in Cuvier and Valenciennes, 1833
Family: Carangidae
Similar species: see Positive identification of amberjacks
Greater Amberjack (*Seriola dumerili*)
Lesser Amberjack (*Seriola fasciata*)
Banded Rudderfish (*Seriola zonata*)
Almaco Jack (*Seriola rivoliana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oWii9FZPjCmKmbchXlUtvm
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1283
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16507347/16510402
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/jacks/greater-amberjack/
http://www.eregulations.com/florida/fishing/flsw13a/keys-to-identifying-the-jacks/
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Brendan Morgan, Erin Burge; video-jon-newbie, Erin Burge

Common name: Atlantic Bonito
Scientific name: *Sarda sarda* (Bloch, 1793)
Family: Scombridae
Similar species: Little Tunny (*Euthynnus alletteratus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oOapJwBWJDZeJs4hFrJ3iH
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4258
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/155096/4703085
Additional information:
https://en.wikipedia.org/wiki/Atlantic_bonito
http://www.stripersonline.com/surftalk/topic/297937-how-to-tell-apart-an-atlantic-bonito-from-a-false-albacore/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Erin Burge, Zeba Knight, Pilotfish; video-jon-newbie

Common name: Atlantic Longarm Octopus
Scientific name: *Macrotritopus defilippi* (Vérany, 1851)
Family: Octopodidae (Phylum Mollusca, Class Cephalopoda)
Similar species: Common Octopus (*Octopus vulgaris*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rPf56tNN_szD1OLmRj5t2m
Authentication: SeaLifeBase
Note: Confirmation of the identification as *Macrotritopus defilippi* was provided by Mike Vecchione, Curator of Cephalopoda at the Smithsonian National Musuem of Natural History.
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/163349/1000932
Additional information:
https://octonation.com/octopedia/atlantic-longarm-octopus/
http://www.marinespecies.org/aphia.php?p=taxdetails&id=534126
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Blacklab, Moonflower, Pilotfish, Erin Burge; video-Pilotfish, Erin Burge

Common name: Atlantic Sharpnose Shark
Scientific name: *Rhizoprionodon terraenovae* (Müller & Henle, 1839)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pU0nUq0EUZbhi7C33iTk8g
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2696
Note: Assistance with identification was provided by Dean Grubbs (FSU), Dan Abel (CCU), and John Mohan (UNE). Identification as Atlantic sharpnose shark is tentative because it is based partially on a process of elimination of other carcharhinid species, and another species of sharpnose, the Caribbean sharpnose shark (*R. porosus*), is visually indistinguishable from the Atlantic sharpnose. Both species overlap geographically near SharkCam. See Davis et al. (2018) for additional information.
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/39382/124408927
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/rhizoprionodon-terraenovae/
https://www.fisheries.noaa.gov/species/atlantic-sharpnose-shark
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Pilotfish, mrbuck; CamOp Kwaahu; video-Pilotfish, Erin Burge

Common name: Atlantic Spadefish
Scientific name: *Chaetodipterus faber* (Broussonet, 1782)
Family: Ephippidae
Similar species: Sheepshead (*Archosargus probatocephalus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ouU5uJhHKXkCZVHH5Ye1M_
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4240

IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16435530/16509752
Additional information:
https://en.wikipedia.org/wiki/Atlantic_spadefish
http://reefguide.org/carib/spadefish.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, meryl, Zeba Knight; video-jon-newbie

B

Common name: Banded Butterflyfish
Scientific name: *Chaetodon striatus* Linnaeus, 1758
Family: Chaetodontidae
Similar species: None
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3845
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165637/6075592
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/chaetodon-striatus/
http://marinebio.org/species.asp?id=433
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-meryl

Common name: Banded Rudderfish
Scientific name: *Seriola zonata* (Mitchill, 1815)
Family: Carangidae
Similar species: see Positive identification of amberjacks
Greater Amberjack (*Seriola dumerili*)
Lesser Amberjack (*Seriola fasciata*)
Almaco Jack (*Seriola rivoliana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qphLEwN7yKIULn7t4-TnCF
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3656
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16507442/16510407
Additional information:
http://www.safmc.net/FishIDandRegs/FishGallery/BandedRudderfish
http://nefsc.noaa.gov/publications/crd/crd1210/jacks.pdf
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-BetterThanWatchingWimbledon, Pilotfish, stilling, Erin Burge; video-jon-newbie, Erin Burge

Common name: Bandtail Puffer
Scientific name: *Sphoeroides spengleri* (Bloch, 1785)
Family: Tetraodontidae
Similar species: Bluehead (*Thalassoma bifasciatum*)
Clown Wrasse (*Halichoeres maculipinna*)
Slippery Dick (*Halichoeres bivittatus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qfhJgjYPP_CkCOQJWhzV1N
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4402
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193630/2249897
Additional information:
http://reefguide.org/carib/bandtailpuffer.html
http://www.snorkelstj.com/bandtail-pufferfish.html
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, Pilotfish, Erin Burge; video-jon-newbie, Pilotfish

Common name: Bar Jack
Scientific name: *Carangoides ruber* (Bloch, 1793)
Note: Many sources use the alternate scientific name *Caranx ruber* for the bar jack. We have followed the current classification for this species from the Integrated Taxonomic Information System.
Family: Carangidae
Similar species: Blue Runner (*Caranx crysos*)
Horse-eye Jack (*Caranx latus*)
Yellow Jack (*Carangoides bartholomaei*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6omClKsK7EXiZlQMFvPuluo
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3639
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16431737/16509637
Additional information:
https://en.m.wikipedia.org/wiki/Bar_jack
http://reefguide.org/carib/barjack.html
Credits: entry-Jordan Beckner; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, 5girls; video-jon-newbie, wivrrat

Common name: Belted Sandfish
Scientific name: *Serranus subligarius* (Cope, 1870)
Family: Serranidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qw4Bcxhz7uAZMKqna38s5Q
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3558
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190339/16510767
Additional information:
http://myfwc.com/research/saltwater/codes/marine-life-finfish/belted-sandfish-bass/
http://www.reefngom.org/beltsand.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, jon-newbie; video-jon-newbie, Erin Burge

Common name: Bermuda Chub
Scientific name: *Kyphosus sectatrix* (Linnaeus, 1758)
Family: Kyphosidae
Note: Recent taxonomic revisions within the sea chubs (Kyphosidae) conclude that there are four distinct species found circumglobally, including in the tropical western Atlantic Ocean, inclusive of Frying Pan Tower. They are *Kyphosus sectatrix*, *K. bigibbus*, *K. cinerascens*, and *K. vaigiensis*. For additional information see Knudsen and Clements (2013) and Knudsen and Clements (2016), and a conflicting view in Sakai and Nakabo (2014). All are visually similar, although differentiating them from field observations has been reported (see Shorefishes of the Greater Caribbean). These revisions and the requirement for close observation make a definitive identification of sea chubs seen on SharkCam very difficult.
Similar species: Spottail Pinfish (*Diplodus holbrookii*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oWPW5_AA_2sYuicszHRIwN
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3841
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/198561/16644027
Additional information:
https://en.wikipedia.org/wiki/Bermuda_chub
http://www.snorkelstj.com/chub.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-John Rainey, jon-newbie, Zeba Knight, Erin Burge; video-jon-newbie, Erin Burge

SharkCam Fishes

Common name: Bicolor Damselfish
Scientific name: *Stegastes partitus* (Poey, 1868)
Family: Pomacentridae
Similar species: Cocoa Damselfish (*Stegastes xanthurus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p9Va3Q5Ayvz2uP_MmP1Pzy
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3881
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/188539/1889965
Additional information:
http://reefguide.org/carib/bicolordamsel.html
http://eol.org/pages/203965/media
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, Erin Burge; video-jon-newbie, Erin Burge, OK!

Common name: Bigeye Scad
Scientific name: *Selar crumenophthalmus* (Bloch, 1793)
Family: Carangidae
Similar species: Round Scad (*Decapterus punctatus*)
Scaled Herring (*Harengula jaguana*)
young Tomtate (*Haemulon aurolineatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6q-Gvw8AOyTW-7cLgfoD7Qg
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1265
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190388/115316971
Additional information:
https://en.wikipedia.org/wiki/Bigeye_scad
http://eol.org/pages/215191/details
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-meryltje, jon-newbie, Erin Burge, ladynole89, Fizzhoggy; video-jon-newbie, Erin Burge

Common name: Black Grouper
Scientific name: *Mycteroperca bonaci* (Poey, 1860)
Family: Serranidae
Similar species: Gag (*Mycteroperca microlepis*)
Goliath Grouper (*Epinephelus itajara*)
Scamp (*Mycteroperca phenax*)
Cubera Snapper (*Lutjanus cyanopterus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oS8BB38ThBdn0-ojzr7O1U
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3521
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/132724/46916253
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/grouper/black-grouper/
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/mycteroperca-bonaci/
Credits: entry-Erin Burge; screen grab-Zeba Knight, mrbuck, CamOp Xavier; video-Erin Burge

Common name: Black Margate
Scientific name: *Anisotremus surinamensis* (Bloch, 1791)
Family: Haemulidae
Similar species: White Margate (*Haemulon album*), White Grunt (*Haemulon plumierii*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rmu4VmTQnkC-y12Oge5x6e
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3712
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/194408/2332935
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=214
https://reefguide.org/keys/blackmargate.html
http://safmc.net/regulations/regulations-by-species/black-margate/
Credits: entry-Erin Burge; editing-Courtney Burge, Pilotfish; screen grab: Sky Pilot, BearBell, meryl, Zeba Knight, Erin Burge; video-Erin Burge

Common name: Black Sea Bass
Scientific name: *Centropristis striata* (Linnaeus, 1758)
Family: Serranidae
Similar species: Graysby (*Cephalopholis cruentata*)
Tautog (*Tautoga onitis*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pA9H62eW14Av2D3RkrWgiw
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3480
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16435325/16510242
Additional information:
https://en.wikipedia.org/wiki/Black_sea_bass
http://www.asmfc.org/species/black-sea-bass
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, John Rainey, Robin Lake, CamOp Dawn; video-jon-newbie, Erin Burge

Common name: Blotched Swimming Crab
Scientific name: *Achelous spinimanus* (Latreille, 1819)
Family: Portunidae
Similar species: Jonah Crab (*Cancer borealis*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qsjwgJCt3c56N_oF4WV6g7
Authentication: SeaLifeBase (mirror)
Note: Many text and online resources use the alternate scientific names, *Portunus spinimanus*, or *Portunus* (*Achelous*) *spinimanus*, for the blotched swimming crab.
IUCN Red List: Not Listed
Additional information:
http://www.marinespecies.org/aphia.php?p=taxdetails&id=456069
http://txmarspecies.tamug.edu/invertdetails.cfm?scinameID=Portunus%20spinimanus
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Erin Burge; video-Derek Bussey, jon-newbie

Common name: Blue Angelfish
Scientific name: *Holacanthus bermudensis* Goode, 1876
Family: Pomacanthidae
Similar species: Queen Angelfish (*Holacanthus ciliaris*)
NOTE: Hybrids of blue and queen angelfishes are known from areas where both species overlap, as they do on SharkCam. This hybrid is commonly known as Townsend's angelfish "Holacanthus townsendi" or more correctly *Holacanthus bermudensis* X *H. ciliaris* hybrid. For additional information see Reyes-Bonilla et al. (2010) and references therein.
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pGfpMugyjAiYnP7S9_EVhy
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3852
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165832/6143879
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/angelblue/angelblue.htm

Appendix 1 – Additional information

https://en.wikipedia.org/wiki/Bermuda_blue_angelfish
http://reefguide.org/carib/blueangel.html
Credits: entry-Erin Burge; editing-jon-newbie; screen grab-Dillon King, meryltje, jon-newbie, Happywho, Zeba Knight, SoundFIsher, BearBell; video-jon-newbie, Erin Burge

Common name: Blue Chromis
Scientific name: *Chromis cyanea* (Poey, 1860)
Family: Pomacentridae
Similar species: Juvenile Purple Reeffish (*Chromis scotti*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qONOuQWw1mKFOzp1Vm512u
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3869
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165910/6162557
Additional information:
http://reefguide.org/carib/bluechromis.html
http://www8.nos.noaa.gov/onms/park/Parks/SpeciesCard.aspx?refID=2&CreatureID=1352&pID=9
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, Pilotfish; video-Pilotfish, Erin Burge

Common name: Blue Runner
Scientific name: *Caranx crysos* (Mitchill, 1815)
Family: Carangidae
Similar species: Bar Jack (*Carangoides ruber*)
Horse-eye Jack (*Caranx latus*)
Yellow Jack (*Carangoides bartholomaei*)
Bluefish (*Pomatomus saltatrix*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qa-Tgr3xWO-XLN3lx6iRdK
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3638
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/154807/4637970
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/jacks/blue-runner/
http://www.snorkelstj.com/blue-runner-jack.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, cynde, jon-newbie; video-jon-newbie, Erin Burge

Common name: Blue Tang
Scientific name: *Acanthurus coeruleus* Bloch and Schneider, 1801
Family: Acanthuridae
Similar species: Doctorfish (*Acanthurus chirurgus*)
Ocean Surgeon (*Acanthurus tractus*)
see Surgeonfishes (*Acanthurus* spp.)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pSLpIIlDBJxOYd6RMoHiet
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4243
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/177953/1501275
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/BlueTang/BlueTang.html
http://reefguide.org/carib/bluetang.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-meryltje, cynde, jon-newbie, Jangsara, Zeba Knight, Chloe Keller, Sky Pilot, dew2, CamOp Pandafan-north, stilling; video-jon-newbie, Tyler McKee, Casey Ludwick

Common name: Bluefish
Scientific name: *Pomatomus saltatrix* (Linnaeus, 1766)
Family: Pomatomidae
Similar species: Blue Runner (*Caranx crysos*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qmGyTtpsU_1VRO5k1SvL0F
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3632
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/190279/115314064
Additional information:
https://www.fisheries.noaa.gov/species/bluefish
http://www.mafmc.org/bluefish/
Credits: entry-Erin Burge; screen grab-Zeba Knight, CamOp Scout, stilling; video-jon-newbie

Common name: Bluehead
Scientific name: *Thalassoma bifasciatum* (Bloch, 1791)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p4aSelWoGbGiERpd-9JTvP
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3906
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187652/8590861
Additional information:
https://www.flmnh.ufl.edu/fish/discover/species-profiles/thalassoma-bifasciatum/
http://eol.org/pages/213331/media
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, jon-newbie, 5girls, AlliCat93; video-jon-newbie, Erin Burge

Common name: Boga
Scientific name: *Haemulon vittatum* (Poey, 1860)
Family: Haemulidae
Similar species: Round Scad (*Decapterus punctatus*)
Striped Grunt (*Haemulon striatum*)
Tomtate (*Haemulon aurolineatum*)
Scaled Herring (*Harengula jaguana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qWPo2RVTVDZrlKYzm8h5ks
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3739
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16509426/115361100
Additional information:
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3739
https://sta.uwi.edu/fst/lifesciences/sites/default/files/lifesciences/documents/ogatt/Haemulon_vittatum%20-%20Boga.pdf
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Pilotfish, BearBell, Erin Burge; video-Pilotfish, Erin Burge

Common name: Bull Shark
Scientific name: *Carcharhinus leucas* (Müller and Henle, 1839)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rGIqenBybOvoQI0saHcu5h

Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/95
Identification confirmed by Dean Grubbs (FSU) and Chip Cotton (SUNY Cobleskill)
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/39372/10187195
Additional information:
http://species-identification.org/species.php?species_group=sharks&id=449
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/carcharhinus-leucas/
http://myfwc.com/media/1388907/SharkChart.pdf
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Zeba Knight, Sky Pilot, meryl, Madduck1, Cody Sweitzer, Erin Burge, CamOp Kwaahu, Pilotfish; video-Cody Sweitzer, Erin Burge, CamOp Kwaahu, Pilotfish

C

Common name: Caribbean Spiny Lobster
Scientific name: *Panulirus argus* (Latreille, 1804)
Family: Palinuridae (Phylum Arthropoda, Class Malacostraca)
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oS7D-ctc1ZnTUCxkOCEysc
Authentication: SeaLifeBase (mirror)
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/169976/6697254
Additional information:
https://en.wikipedia.org/wiki/Panulirus_argus
http://marinebio.org/species.asp?id=155
http://reefguide.org/carib/lobster.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-OKI, jon-newbie, Zeba Knight, Sky Pilot, Pilotfish, Erin Burge; video-jon-newbie

Common name: Clown Wrasse
Scientific name: *Halichoeres maculipinna* (Müller and Troschel in Schomburgk, 1848)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rkeXF-hSV-3exjed8zVOVi
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3898
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187549/8565334
Additional information:
http://reefguide.org/clownwrasse.html
http://www.kilili.com/kilili/uwss/slides/Halichoeres_maculipinna.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Cobia
Scientific name: *Rachycentron canadum* (Linnaeus, 1766)
Family: Rachycentridae
Similar species: Sharksucker (*Echeneis naucrates*)
Whitefin Sharksucker (*Echeneis neucratoides*)
Rainbow Runner (*Elagatis bipinnulata*)
Greater Amberjack (*Seriola dumerili*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o0hQ_c1KFBKUBRppuMh0aq
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3635
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190190/70036823
Additional information:
https://en.wikipedia.org/wiki/Cobia
http://www.flmnh.ufl.edu/fish/gallery/descript/cobia/cobia.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, OKI, cynde, jangsara, meryl, Madduck1; video-jon-newbie, Erin Burge

Common name: Cocoa Damselfish
Scientific name: *Stegastes xanthrus* (Poey, 1860)
Note: The geographic range of the cocoa damselfish in the western Atlantic has historically included Brazilian populations that have been shown to be genetically distinct. These data are currently unpublished (Robertson DR, pers. comm.). For additional information see Eschmeyer's Catalog of Fishes (search *Stegastes variabilis*), Robertson and Van Tassell (2019), and Santos de Souza et al. (2016). Consequently, cocoa damselfish from North Carolina through the southern Caribbean are now assigned to *Stegastes xanthurus,* while the Brazilian species retains the older name, *Stegastes variabilis* (Castelnau, 1855).
Family: Pomacentridae
Similar species: Bicolor Damselfish (*Stegastes partitus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r98NwAhocLqFvt44-Jc6OV
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3884
IUCN Red List: Least Concern as *S. xanthurus*
https://www.iucnredlist.com/species/68308968/68308972
Additional information:
https://reefguide.org/carib/cocoadamselfish.html
http://www.reef.org/enews/articles/damselfish-revised
https://sta.uwi.edu/fst/lifesciences/documents/Stegastes_variabilis.pdf
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3884
Credits: entry-Jordan Beckner; editing-jon-newbie and Erin Burge; screen grab-John Rainey, jon-newbie, meryltje, Zeba Knight, Erin Burge, BearBell; video-jon-newbie, Erin Burge

Common name: Common Loon
Scientific name: *Gavia immer* (Brunnich, 1764)
Family: Gaviidae (Phylum Chordata, Class Aves)
Similar species: None
Authentication: SeaLifeBase
http://www.allaboutbirds.org/guide/ common_loon/id
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/22697842/132607418
Additional information:
http://animals.nationalgeographic.com/animals/birds/common-loon/
https://www.audubon.org/field-guide/bird/common-loon
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Ryan Bono

Common name: Common Octopus
Scientific name: *Octopus vulgaris* Cuvier, 1797
Family: Octopodidae (Phylum Mollusca, Class Cephalopoda)
Similar species: Atlantic Longarm Octopus (*Macrotritopus defilippi*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6q5-ynu93-LZ1Y2NUTqyAsO
Authentication: SeaLifeBase (mirror)
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/162571/918906
Additional information:
https://en.wikipedia.org/wiki/Common_octopus
http://animals.nationalgeographic.com/animals/invertebrates/common-octopus/

http://reefguide.org/carib/commonoctopus.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Sky Pilot; video-jon-newbie

Common name: Creole Wrasse
Scientific name: *Clepticus parrae* (Bloch and Schneider, 1801)
Family: Labridae
Similar species: Blue Chromis (*Chromis cyanea*)
juvenile Purple Reeffish (*Chromis scotti*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oXQ5CZMYp67C--DaJL0A_i
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3889
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187546/8564076
Additional information:
http://www.whatsthatfish.com/fish/creole-wrasse/1589
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=254
http://thedivingblog.com/fish-identification-creole-wrasse/
Credits: entry-Gary Sturm; editing- Erin Burge; screen grab-BearBell, Gary Sturm, jon-newbie, SoundFisher, sam - obx nc; video-jon-newbie

Common name: Crevalle Jack
Scientific name: *Caranx hippos* (Linnaeus, 1766)
Family: Carangidae
Similar species: African Pompano *(Alectis ciliaris)*
Permit (*Trachinotus falcatus*)
Horse-eye Jack (*Caranx latus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r1RGLFG8jk4kJMD9Zoadsc
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3640
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190458/115323321
Additional information:
https://en.wikipedia.org/wiki/Crevalle_jack
https://igfa.org/species/147-jack-crevalle.aspx?CommonName=147-jack-crevalle.aspx
http://myfwc.com/wildlifehabitats/profiles/saltwater/jacks/crevalle-jack/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Ryan Bono, pinebutte, meryltje, jon-newbie, Zeba Knight; video-jon-newbie

Common name: Cubbyu
Scientific name: *Pareques umbrosus* (Jordan and Eigenmann, 1889)
Family: Sciaenidae
Similar species: Whitespotted Soapfish (*Rypticus maculatus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qbpJC-updlklW1TonZLgo_
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3803
IUCN Red List: Least Concern
https://www.iucnredlist.org/species/47148543/86421446
Additional information:
http://eol.org/pages/211227/media
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, Erin Burge, Pilotfish; video-jon-newbie, Erin Burge

Common name: Cubera Snapper
Scientific name: *Lutjanus cyanopterus* (Cuvier in Cuvier and Valenciennes, 1828)
Family: Lutjanidae
Similar species: Gag (*Mycteroperca microlepis*)
Gray Snapper (*Lutjanus griseus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ptZ1qm_osvYa3hf-gfS3V2
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3687
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/12417/506633
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/CuberaSnapper/CuberaSnapper.html
http://animals.nationalgeographic.com/animals/fish/cubera-snapper/
Credits: entry-John Rainey and Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, cynde, Sky Pilot, Zeba Knight, Brenda Sandefur, Erin Burge, BearBell, CamOp Christine, 5girls, mrbuck; video-jon-newbie, Erin Burge

D

Common name: Doctorfish
Scientific name: *Acanthurus chirurgus* (Bloch, 1787)
Family: Acanthuridae
Similar species: Adult Blue Tang (*Acanthurus coeruleus*) Ocean Surgeon (*Acanthurus tractus*)
see Surgeonfishes *Acanthurus* spp.
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rTLR1CJs8mPH0IHYCIvDIH
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4242
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/177982/1510626
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/DrFish/Doctor.htm
http://reefguide.org/carib/doctorfish.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, cynde, pinebutte, meryl; video-jon-newbie

E

F

Common name: French Angelfish
Scientific name: *Pomacanthus paru* (Bloch, 1787)
Family: Pomacanthidae
Similar species: Blue Angelfish (*Holacanthus bermudensis*)
Queen Angelfish (*Holacanthus ciliaris*)
Atlantic Spadefish (*Chaetodipterus faber*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oFn_lqPWddCKJ11dj9KjfB
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3857
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165898/6160204
Additional information:
http://animal-world.com/encyclo/marine/angels/FrenchAngelfish.php
http://reefguide.org/carib/frenchangel.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Zeba Knight, Erin Burge, CamOp Pandafan-north; video-jon-newbie, Erin Burge

G

Common name: Gag
Scientific name: *Mycteroperca microlepis* (Goode and Bean, 1879)

SharkCam Fishes

Family: Serranidae
Similar species: Black Grouper (*Mycteroperca bonaci*)
Goliath Grouper (*Epinephelus itajara*)
Scamp (*Mycteroperca phenax*)
Cubera Snapper (*Lutjanus cyanopterus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rRjTNDRcC9Z6K930bhV8Yw
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3524
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/14050/46910927
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/grouper/gag-grouper/
http://www.seafoods.com/product/396-scamp-florida
Note: Social interactions and their relationship to color and pattern are discussed in Gilmore and Jones (1992).
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-John Rainey, meryltje, jon-newbie, BearBell, Zeba Knight, Erin Burge, emzabdn; video-jon-newbie, Erin Burge

Common name: Giant Manta
Scientific name: *Mobula birostris* (Walbaum, 1792)
Family: Mobulidae (Class Chondrichthyes)
Similar species: Spotted Eagle Ray (*Aetobatus narinari*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qmTnxIF7iIb1JJNEYL-IrC
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/268
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/198921/126669349
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/manta-birostris/
http://marinebio.org/species.asp?id=49
Credits: entry-Tyler McKee; editing-Erin Burge; screen grab- Zeba Knight, Tyler McKee; video-Tyler McKee

Common name: Goliath Grouper
Scientific name: *Epinephelus itajara* (Lichtenstein, 1822)
Family: Serranidae
Similar species: Gag (*Mycteroperca microlepis*)
Scamp (*Mycteroperca phenax*)
Cubera Snapper (*Lutjanus cyanopterus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6q0NCA_S_ujKO7zCQscSyaG
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4760
IUCN status: Vulnerable
https://www.iucnredlist.com/species/195409/46957794
Additional information:
https://en.wikipedia.org/wiki/Atlantic_goliath_grouper
http://www.flmnh.ufl.edu/fish/gallery/descript/goliathgrouper/goliathgrouper.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, getyasome, s_TpAman, Pilotfish, 5girls, CamOp Scout, CamOp Pandafan-north, CajunSurfer, Erin Burge; video-jon-newbie, Erin Burge, CamOp Scout, CamOp Pandafan-north

Common name: Gray Angelfish
Scientific name: *Pomacanthus arcuatus* (Linnaeus, 1758)
Family: Pomacanthidae
Similar species: French Angelfish (*Pomacanthus paru*)
Blue Angelfish (*Holacanthus bermudensis*)
Queen Angelfish (*Holacanthus ciliaris*)
Atlantic Spadefish (*Chaetodipterus faber*)
YouTube: https://youtube.com/playlist?list=PLK1g13VpyT6rK8zLu72cZr7pCOU-OBWSr
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3856
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165887/6157789
Additional information:
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3856
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/pomacanthus-arcuatus/
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-mrbuck, 5girls, Erin Burge; video-Erin Burge

Common name: Gray Snapper
Alternate common name: Mangrove Snapper
Scientific name: *Lutjanus griseus* (Linnaeus, 1758)
Family: Lutjanidae
Similar species: Cubera Snapper (*Lutjanus cyanopterus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pWSkeaDth4RXDWqMv1SgGe
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3688
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/192941/2180367
Additional information:
http://reefguide.org/carib/graysnapper.html
https://www.flmnh.ufl.edu/fish/discover/species-profiles/lutjanus-griseus
http://reefguide.org/carib/graysnapper.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Gray Triggerfish
Scientific name: *Balistes capriscus* Gmelin, 1789
Family: Balistidae
Similar species: Ocean Triggerfish (*Canthidermis sufflamen*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oOoIlavbaSoOIRoxTsIfae
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4364
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/193736/97662794
Additional information:
https://www.flmnh.ufl.edu/fish/discover/species-profiles/balistes-capriscus
http://myfwc.com/fishing/saltwater/recreational/triggerfish/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Graysby
Scientific name: *Cephalopholis cruentata* (Lacepède, 1802)
Family: Serranidae
Similar species: Black Sea Bass (*Centropristis striata*)
Whitespotted Soapfish (*Rypticus maculatus*)
Greater Soapfish (*Rypticus saponaceus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pHlV30wnX1lCHIUuYd7KA7
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3481
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/132761/46916787
Additional information:
http://safmc.net/regulations/regulations-by-species/graysby-2/
https://reefguide.org/graysby.html
Credits: entry-Theresa Hegarty; editing-Erin Burge; screen grab-Erin Burge, Zeba Knight, CamOp Scout; video-Erin Burge

Appendix 1 – Additional information

Common name: Great Barracuda
Scientific name: *Sphyraena barracuda* (Edwards in Catesby, 1771)
Family: Sphyraenidae
Similar species: King Mackerel (*Scomberomorus cavalla*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o8yF58BhDNuQeMYq_qXMqc
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2504
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190399/115319634
Additional information:
http://reefguide.org/carib/barracuda.html
https://www.flmnh.ufl.edu/fish/discover/species-profiles/sphyraena-barracuda/
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-Ryan Bono, meryltje, jon-newbie, Valrydee; video-jon-newbie, Erin Burge

Common name: Great Hammerhead
Scientific name: *Sphyrna mokarran* (Rüppell, 1837)
Family: Sphyrnidae (Class Chondrichthyes)
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qOES7EfilWBR6migzsq-BI
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/116
Identification confirmed by Dean Grubbs (FSU) and Chip Cotton (SUNY Cobleskill)
IUCN Red List: Endangered
https://www.iucnredlist.com/species/39386/10191938
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/sphyrna-mokarran/
http://www.science.fau.edu/sharklab/pages/evolution_res.html
Credits: entry-Erin Burge; editing-Courtney Burge, screen grab-Sky Pilot, Zeba Knight, Erin Burge; video- Sky Pilot, Zeba Knight, Erin Burge

Common name: Great White Shark
Scientific name: *Carcharodon carcharias* (Linnaeus, 1758)
Family: Lamnidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oDPInqbFMTkQ_5JIHgb4Pq
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/49
Identification confirmed by Dean Grubbs (FSU) and Chip Cotton (SUNY Cobleskill)
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/3855/10133872
Additional information:
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Erika, Sky Pilot, Erin Burge, Faith Saupe, Pilotfish, CamOp Scout; video-Erin Burge, Faith Saupe, Pilotfish

Common name: Greater Amberjack
Scientific name: *Seriola dumerili* (Risso, 1810)
Family: Carangidae
Similar species: see Positive identification of amberjacks
Lesser Amberjack (*Seriola fasciata*)
Banded Rudderfish (*Seriola zonata*)
Almaco Jack (*Seriola rivoliana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pLn1TwRrAFNwsvplVv09Uj
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3654
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/198643/115341394
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/jacks/almaco-jack/
http://www.eregulations.com/florida/fishing/flsw13a/keys-to-identifying-the-jacks/
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-John Rainey, meryltje, jon-newbie, Cody Sweitzer, Brendan Morgan, Pilotfish; video-jon-newbie

Common name: Greater Soapfish
Scientific name: *Rypticus saponaceus* (Bloch and Schneider, 1801)
Family: Serranidae
Similar species: Whitespotted Soapfish (*Rypticus maculatus*)
Cubbyu (*Pareques umbrosus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rNrt-gankfwXI_lLSoGI_B
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3542
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193272/2215661
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=194
https://reefguide.org/carib/greatersoapfish.html
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Sky Pilot, meryl, Erin Burge; video-Erin Burge

Common name: Green Sea Turtle
Scientific name: *Chelonia mydas* (Linnaeus, 1758)
Family: Cheloniidae (Phylum Chordata, Class Reptilia)
Similar species: Loggerhead Sea Turtle (*Caretta caretta*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rO0iRgJSbysTjIBW4k2-BV
Authentication: SeaLifeBase (mirror)
Identification confirmed by Kate Mansfield (UCF)
IUCN Red List: Endangered
https://www.iucnredlist.com/species/4615/11037468
Additional information:
https://www.fisheries.noaa.gov/species/green-turtle
https://www.nwf.org/Educational-Resources/Wildlife-Guide/Reptiles/Sea-Turtles/Green-Sea-Turtle
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-AlliCat93, FLNC_NWT, Zeba Knight, Erin Burge; video- Erin Burge

H

Common name: Harlequin Bass
Scientific name: *Serranus tigrinus* (Bloch, 1790)
Family: Serranidae
Note: Harlequin bass are simultaneous hermaphrodites and pair-bonding is believed to be related to cooperative foraging and reproduction. See Pressley (1981) for additional information.
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rUqZPyg2LLjG6SBxhXwJfy
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3560

SharkCam Fishes

IUCN Red List: Least Concern
https://www.iucnredlist.com/species/154799/115236890
Additional information:
http://www.aquariumdomain.com/viewSpeciesMarine.php?id=108
http://reefguide.org/carib/harlequinbass.html
http://www.snorkelstj.com/harleguin-bass.html
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, BearBell, CamOp Scout; video-Erin Burge

Common name: Hogfish
Scientific name: *Lachnolaimus maximus* (Walbaum, 1792)
Family: Labridae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r67p2wQur4nLNwLti-c6su
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3905
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/11130/124708500
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/Hogfish/Hogfish.html
http://reefguide.org/carib/hogfish.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, BearBell, meryl, Zeba Knight, Happywho; video-jon-newbie, Erin Burge

Common name: Horse-eye Jack
Scientific name: *Caranx latus* Agassiz in Spix and Agassiz, 1831
Family: Carangidae
Similar species: Blue Runner (*Caranx crysos*)
Bar Jack (*Carangoides ruber*)
Yellow Jack (*Carangoides bartholomaei*)
Yellowtail Snapper (*Ocyurus chrysurus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oIQ9E_B25KPUmVfSx8RCwh
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3641
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/191829/2007005
Additional information:
https://en.wikipedia.org/wiki/Horse-eye_jack
http://reefguide.org/carib/horseeyejack.htmlhttps://igfa.org/species/148-jack-horse-eye.aspx?CommonName=148-jack-horse-eye.aspx
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, 5girls, Erin Burge, BearBell, CamOp Xavier, CamOp Pandafan-north; video-Erin Burge, 5girls

Common name: Human (Freediver and Scuba Diver)
Scientific name: *Homo sapiens* Linnaeus, 1758
Family: Hominidae (Phylum Chordata, Class Mammalia)
Note: The most frequently seen scuba divers on SharkCam are the maintenance divers, Jim Atack and Erin Burge, and the Frying Pan Tower owner, Richard Neal. Other maintenance divers are listed in Appendix 2. Free divers are typically spearfishers on commercial or private charters. Diving charters to FPT and Sharkcam are available from dive shops in Southport and Carolina Beach, NC.
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r-zIAAvd0U0HvuIAFiudIY
Authentication: Integrated Taxonomic Information System
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/136584/4313662
Additional information:
https://en.wikipedia.org/wiki/Scuba_diving
https://en.wikipedia.org/wiki/Freediving
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Erin Burge, AngelhasnewwingsNC, almcclanahan, Huiling, mrbuck; video-jon-newbie, Erin Burge

I

Common name: Inshore Squids (Longfin Inshore Squid and Slender Inshore Squid)
Scientific names: *Doryteuthis pealeii* (Lesueur, 1821)
Doryteuthis pleii (Blainville 1823)
Family: Loliginidae (Phylum Mollusca, Class Cephalopoda)
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pDokhT5v1fmNrK7CVJgRqj
Authentication:
Longfin Inshore Squid, SeaLifeBase
Slender Inshore Squid, SeaLifeBase
Note: Confirmation of the identification to the genus *Doryteuthis* was provided by Mike Vecchione, Curator of Cephalopoda at the Smithsonian National Musuem of Natural History.
IUCN Red List: Least Concern
Longfin Inshore Squid,
https://www.iucnredlist.com/species/163165/979795
Slender Inshore Squid,
https://www.iucnredlist.com/species/163020/964247
Additional information:
https://www.fisheries.noaa.gov/species/longfin-squid
https://www.vims.edu/research/departments/fisheries/programs/multispecies_fisheries_research/species_data/longfin_inshore_squid/index.php
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Pilotfish, Erin Burge; video-Pilotfish, Erin Burge

J

Common name: Jonah Crab
Scientific name: *Cancer borealis* Stimpson, 1859
Family: Cancridae (Phylum Arthropoda, Class Malacostraca)
Similar species: Blotched Swimming Crab (*Achelous spinimanus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pEhBPXUV09kQ9RI7oaGTB5
Authentication: SeaLifeBase
Note: Identification as the Jonah crab is based on a provisional identification as a *Cancer* sp. crab by David Knott (SERTC) and the relatively massive claws seen on SharkCam.
IUCN Red List: Not listed
Additional information: https://en.wikipedia.org/wiki/Jonah_crab
https://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/images/species-results/pdfs/Cancer_Crabs.pdf
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-BearBell, CamOp Kwaahu; video-Erin Burge, CamOp Kwaahu, stilling

K

Common name: King Mackerel
Scientific name: *Scomberomorus cavalla* (Cuvier, 1829)
Family: Scombridae
Similar species: Great Barracuda (*Sphyraena barracuda*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rXwQZzEZikeZ--zz-9PV9l
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4261
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170339/6755835
Additional information:
http://www.dnr.sc.gov/marine/species/kingmackerel.html

https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/scomberomorus-cavalla
https://www.igfa.org/species/157-mackerel-king.aspx?CommonName=157-mackerel-king.aspx
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-jon-newbie, Sky Pilot; video-jon-newbie

Common name: Knobbed Porgy
Scientific name: *Calamus nodosus* Randall and Caldwell, 1966
Family: Sparidae
Similar species: Red Porgy (*Pagrus pagrus*)
Saucereye Porgy (*Calamus calamus*)
Scup (*Stenotomus chrysops*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rGrCHuy8vVVhEw25oZmhKF
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3748
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170178/1288028
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/porgy/knobbed-porgy/
http://eol.org/pages/211202/overview
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-cynde, jon-newbie, BearBell; video-jon-newbie, Erin Burge

L

Common name: Lemon Shark
Scientific name: *Negaprion brevirostris* (Poey, 1868)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6of-I72FvQSlpORS1JygxuS
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/107
Identification confirmed by Dean Grubbs (FSU) and Chip Cotton (SUNY Cobleskill)
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/39380/81769233
Additional information: http://species-identification.org/species.php?species_group=sharks&id=470
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/negaprion-brevirostris/
Credits: entry-Erin Burge; screen grab-Zeba Knight, Sky Pilot, britth, Space_whale2112, Cody Sweitzer, BearBell, dew2, Happywho, Erin Burge, 5girls; video-Erin Burge

Common name: Lesser Amberjack
Scientific name: *Seriola fasciata* (Bloch, 1793)
Family: Carangidae
Similar species: see Positive identification of amberjacks
Greater Amberjack (*Seriola dumerili*)
Banded Rudderfish (*Seriola zonata*)
Almaco Jack (*Seriola rivoliana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r8yFtCb1WkPRXdhfOnEd3C
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3655
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190139/115311828
Additional information:
https://myfwc.com/wildlifehabitats/profiles/saltwater/jacks/lesser-amberjack/
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3655
Credits: entry-Elle Harris; editing-Erin Burge; screen grab-Pilotfish, Erin Burge, SoundFisher; video-Pilotfish, Erin Burge

Common name: Little Tunny
Alternate common names: False Albacore, Little Tuna, Bonita, Albie
Scientific name: *Euthynnus alletteratus* (Rafinesque, 1810)
Family: Scombridae
Similar species: Atlantic Bonito (*Sarda sarda*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rPjqVXnguEYGXrWZ-j0CdN
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4257
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170345/6759394
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/littletunny/littletunny.html
https://en.wikipedia.org/wiki/Little_tunny
http://www.stripersonline.com/surftalk/topic/297937-how-to-tell-apart-an-atlantic-bonito-from-a-false-albacore/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Christine Casterline, jon-newbie, OKI; video-jon-newbie

Common name: Loggerhead Sea Turtle
Scientific name: *Caretta caretta* (Linnaeus, 1758)
Family: Cheloniidae (Phylum Chordata, Class Reptilia)
Similar species: Green Sea Turtle (*Chelonia mydas*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qpXRImUVe3l2WCyt33HT07
Authentication: SeaLifeBase (mirror)
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/3897/119333622
Additional information:
http://www.ncwildlife.org/Portals/0/Conserving/documents/FactSheets/nongame_seaturtle_hires.pdf
http://www.fws.gov/northflorida/seaturtles/turtle%20factsheets/loggerhead-sea-turtle.htm
http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-Jim, jon-newbie, OKI, Erin Burge, cynde; video-jon-newbie. Erin Burge

M

Common name: Moon Jelly
Scientific name: *Aurelia aurita* (Linnaeus, 1758)
Family: Ulmaridae (Phylum Cnidaria, Class Scyphozoa)
Similar species: Sea Wasp (*Alatina alata*)
Warty Comb Jelly (*Mnemiopsis leidyi*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rTiaXi-k2pGkj7nQUl7y39
Authentication: SeaLifeBase (mirror)
IUCN Red List: Not Listed
Additional information:
https://en.wikipedia.org/wiki/Aurelia_aurita
http://reefguide.org/carib/moonjelly.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, OKI, Pilotfish, Erin Burge; video-jon-newbie, Erin Burge

SharkCam Fishes

N

Common name: Northern Sennet
Scientific name: *Sphyraena borealis* DeKay, 1842
Family: Sphyraenidae
Similar species: Round Scad (*Decapterus punctatus*)
Bigeye Scad (*Selar crumenophthalmus*)
Scaled Herring (*Harengula jaguana*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6poEYAI0X1rBD6ZrstQ0qlc
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4246
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/20666166/115385705
Additional information:
https://spo.nmfs.noaa.gov/sites/default/files/pdf-content/1972/701/houde.pdf
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4246
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Sky Pilot, Erin Burge, mrbuck; video-Erin Burge

Common name: Nurse Shark
Scientific name: *Ginglymostoma cirratum* (Bonnaterre, 1788)
Family: Ginglymostomatidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p-Pyklj-9TMVc2lVxancDx
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/24
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/60223/12325895
Additional information:
http://reefguide.org/carib/nurseshark.html
http://www.flmnh.ufl.edu/fish/gallery/descript/nurseshark/nurseshark.htm
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Zeba Knight; video-jon-newbie

O

Common name: Ocean Surgeon
Scientific name: *Acanthurus tractus* Poey, 1860
Note: Reference books and online resources have historically used the scientific name *Acanthurus bahianus* for the entire geographic range of the ocean surgeon. It was recently proposed that the northwestern Atlantic *A. bahianus* is actually *A. tractus* (ocean surgeon), and that *A. bahianus* (ocean surgeonfish) be reserved for the Brazilian population. See Bernal and Rocha (2011) for more detail.
Family: Acanthuridae
Similar species: Adult Blue Tang (*Acanthurus coeruleus*)
Doctorfish (*Acanthurus chirurgus*)
see Surgeonfishes (*Acanthurus* spp.)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p82Z5-PC5Sdb27Y1feHxbX
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/424
http://www.mapress.com/zootaxa/2011/f/zt02905p068.pdf
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/47139706/115398896
Additional information:
http://reefguide.org/carib/surgeonfish.html
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=207
Credits: entry-Erin Burge; screen grab-Novictulus, sam - obx nc; video-Erin Burge

Common name: Ocean Triggerfish
Scientific name: *Canthidermis sufflamen* (Mitchill, 1815)
Family: Balistidae
Similar species: Gray Triggerfish (*Balistes capriscus*)
YouTube: https://youtube.com/playlist?list=PLK1g13VpyT6q-WU3EaVSZyCW8l5Ce4Lcd
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4367
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190332/115315033
Additional information: https://reefguide.org/oceantrigger.html
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-mrbuck, BearBell, Erin Burge, Pilotfish; video-Erin Burge

Common name: Orange Filefish
Scientific name: *Aluterus schoepfii* (Walbaum, 1792)
Family: Monacanthidae
Similar species: Scrawled Filefish (*Aluterus scriptus*)
Orangespotted Filefish (*Cantherhines pullus*)
Planehead Filefish (*Stephanolepis hispidus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6r0x2xC7VCDMnHKvQHFi3gj
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4371
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16404974/115354409
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/aluterus-schoepfii/
http://www.gma.org/fogm/Alutera_schoepfii.htm
Credits: entry-Gary Sturm and Erin Burge; editing- Erin Burge; screen grab-jon-newbie, Gary Sturm; video-jon-newbie, Devon Carey

Common name: Orangespotted Filefish
Scientific name: *Cantherhines pullus* (Ranzani, 1842)
Family: Monacanthidae
Similar species: Scrawled Filefish (*Aluterus scriptus*)
Orange Filefish (*Aluterus schoepfii*)
Planehead Filefish (*Stephanolepis hispidus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oxiUq88UI8iYUUETZomPip
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4373
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16431606/115356802
Additional information:
http://reefguide.org/carib/orangespottedfile.html
http://www.snorkelstj.com/orangespotted-filefish.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-Devon Carey

Common name: Oyster Toadfish
Scientific name: *Opsanus tau* (Linnaeus, 1766)
Family: Batrachoididae
NOTE: Male toadfish make a distinctive "foghorn" or "boat-whistle" sound to attract a mate. This sound is frequently heard by divers even when the fish is not seen.
https://dosits.org/galleries/audio-gallery/fishes/oyster-toadfish/

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0182757
Similar species: Spotted Scorpionfish
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rMc3UDbzYFUubpNlMHd0u6
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3158
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16441738/16509767
Additional information:
https://www.chesapeakebay.net/S=0/fieldguide/critter/oyster_toadfish
https://www.edc.uri.edu/restoration/html/gallery/fish/toad.htm
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-BearBell, 5girls; video-Erin Burge

P

Common name: Painted Wrasse
Scientific name: *Halichoeres caudalis* (Poey, 1860)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6omCeHRc8FEP53hoQAQbTUc
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3895
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187405/8526833
Additional information:
https://biogeodb.stri.si.edu/caribbean/en/gallery/specie/3895
https://ncfishes.com/marine-fishes-of-north-carolina/halichoeres-caudalis/
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-paz, AlliCat93, Pilotfish; video-Pilotfish

Common name: Palometa
Scientific name: *Trachinotus goodei* Jordan and Evermann, 1896
Family: Carangidae
Similar species: Permit (*Trachinotus falcatus*)
Atlantic Spadefish (*Chaetodipterus faber*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6quwG2xwicvMbFxXTLlcnqs
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3660
IUCN Red List: Least Concern
https://www.iucnredlist.org/species/154970/4679678
Additional information:
https://www.georgiaaquarium.org/animal/palometa/
https://en.wikipedia.org/wiki/Trachinotus_goodei
Credits: entry-Erin Burge; editing-Pilotfish; screen grab-CamOp Scout, stilling, 5girls, Erin Burge; video-5girls, Erin Burge

Common name: Permit
Scientific name: *Trachinotus falcatus* (Linnaeus, 1758)
Family: Carangidae
Similar species: Palometa (*Trachinotus goodei*)
African Pompano (*Alectis ciliaris*)
Crevalle Jack (*Caranx hippos*)
Horse-eye Jack (*Caranx latus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oqZF_abWb8j4icFLbSIAcg
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3659
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190407/16510662
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/Descript/permit/permit.html
https://en.wikipedia.org/wiki/Permit_(fish)
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, Zeba Knight; video-jon-newbie

Common name: Pilotfish
Scientific name: *Naucrates ductor* (Linnaeus, 1758)
Family: Carangidae
Similar species: juvenile Banded Rudderfish (*Seriola zonata*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oHS7Rsg0VCh5UzZ2PIsl1p
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1279
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190452/115322218
Additional information: https://en.wikipedia.org/wiki/Pilot_fish
http://renotonna.yolasite.com/fanfru.php
https://www.thedodo.com/how-one-genius-little-fish-con-672797576.html
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Planehead Filefish
Scientific name: *Stephanolepis hispidus* (Linnaeus, 1766)
Family: Monacanthidae
Similar species: Scrawled Filefish (*Aluterus scriptus*)
Orange Filefish (*Aluterus schoepfii*)
Orangespotted Filefish (*Cantherhines pullus*)
Gray Triggerfish (*Balistes capriscus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p-y_HW3QYn5boAPUqLzs-H
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4378
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16781168/115366674
Additional information:
http://txmarspecies.tamug.edu/fishdetails.cfm?scinameID=Stephanolepis%20hispidus
http://www.redorbit.com/reference/planehead-filefish-stephanolepis-hispidus/
Credits: entry-Gary Sturm; editing-Erin Burge; screen grab-jon-newbie, SoundFIsher; video-jon-newbie, Erin Burge

Common name: Porkfish
Scientific name: *Anisotremus virginicus* (Linnaeus, 1758)
Family: Haemulidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qPXk3HDWREFFAHym1i2u4y
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3713
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/194409/2333098
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/anisotremus-virginicus/
https://sta.uwi.edu/fst/lifesciences/documents/Anisotremus_virginicus.pdf
Credits: entry-Gary Sturm; editing-Erin Burge; screen grab-Erin Burge, 5girls, CamOp Xavier, CamOpScout; video-Erin Burge, 5girls, CamOp Xavier, CamOpScout

Common name: Princess Parrotfish
Scientific name: *Scarus taeniopterus* Desmarest in Bory de Saint-Vincent, 1831
Family: Scaridae
Similar species: initial phase Striped Parrotfish (*Scarus iseri*)

juvenile Redband Parrotfish (*Sparisoma aurofrematum*)
Youtube: https://www.youtube.com/playlist?list=PL1g13VpyT6qLIXXDO7d516Oofw1G_SKU
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3917
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190750/17784981
Additional information:
https://reefguide.org/carib/princessparrot.html
https://sta.uwi.edu/fst/lifesciences/documents/Scarus_taeniopterus.pdf
Credits: entry-Gary Sturm and Erin Burge; editing-Erin Burge; screen grab-jon-newbie,BearBell, Elaine T, Jessica Pollack, CamOp Xavier, 5girls, stilling' video-Erin Burge

Common name: Puddingwife
Scientific name: *Halichoeres radiatus* (Linnaeus, 1758)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qG2fIsXZCAjSt1EUTJcYFF
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3901
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187736/8616408
Additional information:
http://reefguide.org/carib/puddingwife.html
http://www.snorkelstj.com/puddingwife.html
Note: Mixed species hunting behaviors have been described between puddingwife and bar jacks. See https://youtu.be/r5nyBLmMJ2M and a paper by Baird (1993) describing this behavior.
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-meryltje, jon-newbie, BearBell, meryl, Zeba Knight, CamOp Pandafan-north; video-jon-newbie, Erin Burge

Common name: Purple Reeffish
Scientific name: *Chromis scott*i Emery, 1968
Family: Pomacentridae
Similar species: Cocoa Damselfish (*Stegastes xanthurus*)
Blue Chromis (*Chromis cyanea*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pdZ5Be2cgzemUKAKAKzIQI
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3875
Territorial male: Identification by Carol Cox
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/188469/1879814
Additional information:
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3875
Territorial male:
https://biogeodb.stri.si.edu/caribbean/en/pages/random/1938
Credits: entry-jon-newbie and Erin Burge; editing-Erin Burge; screen grab-jon-newbie, meryl, Jessica Pollack, Pilotfish; video-jon-newbie, Erin Burge

Common name: Purplemouth Moray
Scientific name: *Gymnothorax vicinus* (Castelnau, 1855)
Note: In earlier editions of the Guide, this species was identified as green moray, *Gymnothorax funebris.* Further consideration of the appearance and range of green moray, and in situ observations at Frying Pan Tower, suggest that identification was wrong. The authors regret the error.
Family: Muraenidae
Similar species: Spotted Moray (*Gymnothorax moringa*)
Sharptail Eel (*Myrichthys breviceps*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ptAYja0gN4V2QUikc7VkJu
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2803
IUCN Red List: Least Concern
https://www.iucnredlist.org/species/195805/2420286
Additional information:
https://florent.us/reef/keys/purplemouthmoray.html
http://www.antiguamarinelife.info/Purplemouth_Moray.html
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie; video-jon-newbie, Nicholas Coleman

Q

Common name: Queen Angelfish
Scientific name: *Holacanthus ciliaris* (Linnaeus, 1758)
Family: Pomacanthidae
Similar species: Blue Angelfish (*Holacanthus bermudensis*)
NOTE: Hybrids of queen and blue angelfishes are known from areas where both species overlap, as they do on SharkCam. This hybrid is commonly known as Townsend's angelfish "Holacanthus townsendi" or more correctly *Holacanthus bermudensis* X *H. ciliaris* hybrid. For additional information see Reyes-Bonilla et al. (2010) and references therein.
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o3EoXicmyuBTtC1bsHaSO3
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3853
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165883/6156566
Additional information:
https://en.wikipedia.org/wiki/Queen_angelfish
http://reefguide.org/carib/queenangel.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-Christine Casterline, jon-newbie, meryl, s_TpaMan, Cody Sweitzer; video-jon-newbie

R

Common name: Rainbow Runner
Scientific name: *Elagatis bipinnulata* (Quoy and Gaimard, 1825)
Family: Carangidae
Similar species: Cobia (*Rachycentron canadum*)
Yellowtail Snapper (*Ocyurus chrysurus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o4OL8iL6KF9DPwmtXSwajT
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1277
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16440027/16510157
Additional information:
http://www.fao.org/fishery/species/3122/en
http://myfwc.com/fishing/saltwater/recreational/cobia/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, OKI; video-jon-newbie

Common name: Red Drum
Alternate common names: Redfish, Channel Bass, Puppy Drum
Scientific name: *Sciaenops ocellatus* (Linnaeus, 1766)
Family: Sciaenidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pYbC16Cj6q58wWsFPumHVN
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3810
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193270/49226782
Additional information:

http://portal.ncdenr.org/web/mf/red-drum
http://www.asmfc.org/uploads/file/58d92c82AtlanticSciaenidHabitat_RedDrum.pdf
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/sciaenops-ocellatus/
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Sky Pilot, Erin Burge, SoundFisher, Pilotfish; video-Erin Burge, Pilotfish

Common name: Red Lionfish
Scientific name: *Pterois volitans* (Linnaeus, 1758)
Family: Scorpaenidae
Similar species: None. Another species of invasive lionfish, *Pterois miles*, also occurs at very low frequencies in North Carolina waters. *Pterois volitans* and *P. miles* are visually indistinguishable and most researchers do not attempt to separate them within the invasive range.
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rHiLKoY-BjcttFXtzVNXHp
Note: Only a few lionfish have been seen on SharkCam. One was removed from the camera view on 27 December 2015. Please report any sightings of red lionfish on the SharkCam forum. Be sure to include the date and time of observation.
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4640
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190468/78940195
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/redlionfish/rlionfish.html
http://nas.er.usgs.gov/queries/factsheet.aspx?speciesid=963
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab: Erin Burge, OKI, jon-newbie, CamOp Xavier, CamOp Pandafan-north; video-jon-newbie, Erin Burge

Common name: Red Porgy
Scientific name: *Pagrus pagrus* (Linnaeus, 1758)
Family: Sparidae
Similar species: Knobbed Porgy (*Calamus nodosus*)
Saucereye Porgy (*Calamus calamus*)
Scup (*Stenotomus chrysops*)
White Grunt (*Haemulon plumierii*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pGl79DB8z_B5mKF8GWTgYF
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3760
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/15873/788483
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/porgy/red-porgy/
http://www.safmc.net/FishIDandRegs/FishGallery/RedPorgy
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Zeba Knight; video-jon-newbie

Common name: Redband Parrotfish
Scientific name: *Sparisoma aurofrenatum* (Valenciennes in Cuvier and Valenciennes, 1840)
Family: Scaridae
Similar species: Striped Parrotfish (*Scarus iseri*)
Princess Parrotfish (*Scarus taeniopterus*)
Stoplight Parrotfish (*Sparisoma viride*)
Yellowtail Parrotfish (*Sparisoma rubripinne*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o0UjHkZIMHzLZOgZ2Tumam
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3921
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190729/17780851
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=252
http://reefguide.org/carib/redbandparrot.html
Credits: entry-Kyle Gallion; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, jon-newbie, meryltje, cheri-herald, BearBell; video-jon-newbie

Common name: Reef Butterflyfish
Scientific name: *Chaetodon sedentarius* Poey, 1860
Family: Chaetodontidae
Similar species: Spotfin Butterflyfish (*Chaetodon ocellatus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6od_MaJfZChhk7bzq6FXU_w
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3844
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/155220/4749409
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/chaetodon-sedentarius/
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3844
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Pilotfish; video-Erin Burge, Pilotfish

Common name: Rock Beauty
Scientific name: *Holacanthus tricolor* (Bloch, 1795)
Family: Pomacanthidae
Similar species: Queen Angelfish (*Holacanthus ciliaris*)
French Angelfish (*Pomacanthus paru*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pHGLJQi_bIp6BlPczM11NB
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3855
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165879/6155521
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/holacanthus-tricolor/
https://sta.uwi.edu/fst/lifesciences/sites/default/files/lifesciences/documents/ogatt/Holacanthus_tricolor%20-%20Rock%20Beauty%20Angelfish.pdf
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-meryl, Sky Pilot, Zeba Knight; video-Erin Burge

Common name: Round Scad
Scientific name: *Decapterus punctatus* (Cuvier, 1829)
Family: Carangidae
Similar species: Bigeye Scad (*Selar crumenophthalmus*)
Scaled Herring (*Harengula jaguana*)
young Tomtate (*Haemulon aurolineatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oZ6-xnGAp2LaVUi4zwmFH_
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3643
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16439848/115358644
Additional information:
https://en.wikipedia.org/wiki/Round_scad
http://eol.org/pages/205453/overview
Credits: entry-Jordan Beckner; editing-jon-newbie and Erin Burge; screen grab-John Rainey; video-jon-newbie

S

Common name: Saddled Blenny

SharkCam Fishes

Scientific name: *Malacoctenus triangulatus* Springer, 1959
Family: Labrisomidae
Similar species: Seaweed Blenny (*Parablennius marmoreus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qJ5dAvBJedwcy2pSDQlLm7
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3959
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/46104272/48395766
Additional information:
http://www.snorkelstj.com/saddled-blenny.html
http://eol.org/pages/207875/overview
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, cynde, jon-newbie; video-jon-newbie

Common name: Sand Tiger Shark
Scientific name: *Carcharias taurus* Rafinesque, 1810
Family: Odontaspididae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pbDnjnma3Cmj3vfXxD96h7
Note: Dark blotches on the flanks of sand tiger sharks form a spot pattern that is unique to each individual. The authors are contributing images from SharkCam to the Spot-A-Shark USA program, in partnership with the conservation program of the North Carolina Aquariums. If you capture an image that clearly shows this pattern please submit it via e-mail to Erin Burge or notify us via the SharkCam forum of the images. Image filenames should include the date and time of capture (YYYYMMDD HHMM preferred) and your name or online pseudonym for due credit.
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2674
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/3854/10132481
Additional information:
http://animals.nationalgeographic.com/animals/fish/sandtiger-shark.html
http://www.flmnh.ufl.edu/fish/gallery/descript/sandtiger/sandtiger.html
https://en.wikipedia.org/wiki/Sand_tiger_shark
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Ryan Bono, meryltje, jon-newbie, s_TpaMan, Mo13, Zeba Knight, Ellieanne, AlliCat93, SusieChancy, wivrrat; video-jon-newbie, Erin Burge

Common Name: Sandbar Shark
Scientific Name: *Carcharhinus plumbeus* (Nardo, 1827)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Spinner Shark (*Carcharhinus brevipinna*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qS-SsdtLblb-OmCwS0sAyU
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/99
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/3853/10130397
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/sandbarshark/sandbarshark.htm
https://en.wikipedia.org/wiki/Sandbar_shark
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Christine Casterline, jon-newbie, meryltje; video-jon-newbie

Common name: Saucereye Porgy
Scientific name: *Calamus calamus* (Valenciennes in Cuvier and Valenciennes, 1830)
Family: Sparidae
Similar species: Knobbed Porgy (*Calamus nodosus*)
Red Porgy (*Pagrus pagrus*)
Scup (*Stenotomus chrysops*)
White Grunt (*Haemulon plumierii*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ppZjGNagMnrqZPYJ1PTGV7
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3744
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170249/1301306
Additional information:
http://eol.org/pages/213698/overview
http://safmc.net/FishIDandRegs/FishGallery/SaucereyePorgy
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie; video-jon-newbie, Erin Burge

Common name: Scaled Herring
Scientific name: *Harengula jaguana* Poey, 1865
Family: Clupeidae
Similar species: Round Scad (*Decapterus punctatus*)
Bigeye Scad (*Selar crumenophthalmus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6or7soKnPAiRR1wCwdDXa1c
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2921
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190478/1953107
Additional information:
http://www.sms.si.edu/irlspec/harengula_jaguana.htm
https://en.wikipedia.org/wiki/Scaled_sardine
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-jon-newbie; video-jon-newbie, Erin Burge

Common name: Scamp
Scientific name: *Mycteroperca phenax* Jordan and Swain, 1884
Family: Serranidae
Similar species: Gag (*Mycteroperca microlepis*)
Goliath Grouper (*Epinephelus itajara*)
Cubera Snapper (*Lutjanus cyanopterus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6on44ahHGztw5Zwq4QJbvx3
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3525
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/132729/46916602
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/grouper/scamp/
https://en.wikipedia.org/wiki/Scamp_grouper

Appendix 1 – Additional information

Note: Social interactions and their relationship to color and pattern are discussed in Gilmore and Jones (1992).
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, OKI, John Rainey, Zeba Knight; video-jon-newbie

Common name: Scrawled Cowfish
Scientific name: *Acanthostracion quadricornis* (Linnaeus, 1758)
Family: Ostraciidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oAB5z8L6lCgaoVX268tzX6
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4382
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193647/2253412
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/acanthostracion-quadricornis/
https://reefguide.org/keys/scrawledcowfish.html
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-meryl, Zeba Knight, Happywho, Erin Burge, CamOp Scout; video-Erin Burge

Common name: Scrawled Filefish
Scientific name: *Aluterus scriptus* (Osbeck, 1765)
Family: Monacanthidae
Similar species: Orangespotted Filefish (*Cantherhines pullus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rBo-mV_7vn0Yc96o2edURV
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2411
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190125/115310837
Additional information:
https://en.wikipedia.org/wiki/Aluterus_scriptus
https://www.flmnh.ufl.edu/fish/Gallery/Descript/ScrawledFilefish/ScrawledFilefish.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, cynde, meryltje, Tyler McKee; video-jon-newbie

Common name: Scup
Scientific name: *Stenotomus chrysops* (Linnaeus, 1766)
Family: Sparidae
Similar species: Knobbed Porgy (*Calamus nodosus*)
Red Porgy (*Pagrus pagrus*)
Saucereye Porgy (*Calamus calamus*)
Spottail Pinfish (*Diplodus holbrookii*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rTvq5bM6o1KR3Zp51km-_Q
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3763
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/170168/1286359
Additional information:
https://www.nefsc.noaa.gov/publications/tm/tm149/tm149.pdf
https://en.wikipedia.org/wiki/Scup
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Sea Wasp
Scientific name: *Alatina alata* (Reynaud, 1830)
Family: Alatinidae (Phylum Cnidaria, Class Cubozoa)
Similar species: Moon Jelly (*Aurelia aurita*)
Warty Comb Jelly (*Mnemiopsis leidyi*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6piWBe6zpfwXMx05m7QzqMC
Authentication: SeaLifeBase (mirror)
Dr. Rob Condon (Young Scientist Academy) provided the identification of this species.
Additional information:
http://www.marinespecies.org/aphia.php?p=taxdetails&id=289378
https://pubmed.ncbi.nlm.nih.gov/27820907/
Credits: entry-Erin Burge; editing-Pilotfish; screen grab-stilling, Erin Burge; video-Erin Burge

Common name: Seaweed Blenny
Scientific name: *Parablennius marmoreus* (Poey, 1876)
Family: Blenniidae
Similar species: Saddled Blenny (*Malacoctenus triangulatus*) **E**
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4083
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/46104109/48355484
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/parablennius-marmoreus/
https://www.sms.si.edu/irlspec/Parabl_marmor.htm
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-BearBell, Zeba Knight

Common name: Sergeant Major
Scientific name: *Abudefduf saxatilis* (Linnaeus, 1758)
Family: Pomacentridae
Similar species: Sheepshead (*Archosargus probatocephalus*)
juvenile Banded Rudderfish (*Seriola zonata*)
Atlantic Spadefish (*Chaetodipterus faber*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ra72ls6Vu2SVUVys2kkIUt
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3867
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/188581/1896808
Additional information:
http://reefguide.org/carib/sergeantmajor.html
http://www.sms.si.edu/irlspec/Abudefduf_saxatilis.htm
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-Ryan Bono, jon-newbie, meryl; video-jon-newbie

Common name: Sharksucker
Scientific name: *Echeneis naucrates* Linnaeus, 1758
Family: Echeneidae
Similar species: Whitefin Sharksucker (*Echeneis neucratoides*)
juvenile Cobia (*Rachycentron canadum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qko3xrvUQwPXHKlkNt8RXL
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/1226
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190393/115317934
Additional information:
http://reefguide.org/carib/sharksucker.html
https://www.flmnh.ufl.edu/fish/Gallery/Descript/LiveSharksucker/LiveSharksucker.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Erin Burge, AlliCat93; video-jon-newbie, Erin Burge

Common name: Sharpnose Puffer
Scientific name: *Canthigaster rostrata* (Bloch, 1786)
Family: Tetraodontidae

Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qzSi-lpdU232N4duvUBfpt
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4389
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193793/2277707
Additional information:
http://reefguide.org/carib/sharpnosepuffer.html
http://www.snorkelstj.com/sharpnose-pufferfish.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, Zeba Knight, Meryl, Erin Burge, AlliCat93; video-jon-newbie, Erin Burge

Common name: Sharptail Eel
Scientific name: *Myrichthys breviceps* (Richardson, 1848)
Family: Ophichthidae
Similar species: Purplemouth Moray (*Gymnothorax vicinus*) Spotted Moray (*Gymnothorax moringa*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qEGbw4ALTCtHbkzj-EtUfz
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2838
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/199029/2551596
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=155
https://daniellesdives.wordpress.com/2012/04/29/creature-feature-sharptail-eel/
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-Pine Butte, jon-newbie, AlliCat93; video-jon-newbie, Erin Burge

Common name: Sheepshead
Scientific name: *Archosargus probatocephalus* (Walbaum, 1792)
Family: Sparidae
Similar species: Sergeant Major (*Abudefduf saxatilis*) Atlantic Spadefish (*Chaetodipterus faber*) juvenile Banded Rudderfish (*Seriola zonata*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pEzWUPcbn_jDB6nC59YiQb
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3740
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170223/1296293
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/sheepshead/sheepshead.html
http://myfwc.com/fishing/saltwater/recreational/sheepshead/
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-John Rainey, meryltje, jon-newbie, Cody Sweitzer, Zeba Knight; video-jon-newbie

Common name: Slippery Dick
Scientific name: *Halichoeres bivittatus* (Bloch, 1791)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qRznMiqTQuN9L5ib0ItF0D
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3894
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187482/8547710
Additional information:
http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxid=24973
http://eol.org/pages/220796/media
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, meryltje; video-jon-newbie, Erin Burge

Common name: Southern Flounder
Scientific name: *Paralichthys lethostigma* Jordan and Gilbert in Jordan and Meek, 1884
Family: Paralichthyidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rJVroLLj9tn3smsRShYHjG
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4305
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/202632/46958684
Additional information:
http://gcrl.usm.edu/public/fish/flounder.php
http://www.dnr.sc.gov/marine/species/southernflounder.html
http://portal.ncdenr.org/web/mf/flounder_southern
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Dave Klett, gagilmer, Erin Burge; video-Dave Klett, Zeba Knight, Erin Burge, Pilotfish

Common name: Southern Stingray
Scientific name: *Hypanus americanus* (Hildebrand and Schroeder, 1928)
Note: The taxonomic classification of the stingrays (Dasyatidae) was recently revised and the genus *Dasyatis* moved to *Hypanus*. See Last et al. (2016) for additional details.
Family: Dasyatidae (Class Chondrichthyes)
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6royfkmGsDMb82aq5N5-AnI
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2740
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/60149/104123038
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/SouthernStingray/SouthernStingray.html
https://en.wikipedia.org/wiki/Southern_stingray
https://biotaxa.org/Zootaxa/article/view/zootaxa.4139.3.2
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, 5girls; video-jon-newbie, Erin Burge

Common name: Spanish Hogfish
Scientific name: *Bodianus rufus* (Linnaeus, 1758)
Family: Labridae
Similar species: Spotfin Hogfish (*Bodianus pulchellus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oG6f1jxOt9f67UqnKaS8HO
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3887
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187672/8596282
Additional Information:
https://en.wikipedia.org/wiki/Spanish_hogfish
http://eol.org/pages/212988/media
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-Samantha Lungari, meryltje, jon-newbie, meryl, Zeba Knight

Common name: Spinner Shark
Scientific name: *Carcharhinus brevipinna* (Müller & Henle, 1839)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks

Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Tiger Shark (*Galeocerdo cuvier*)
YouTube: https://youtube.com/playlist?list=PLK1g13VpyT6rrxtl59CE6R6LejWJfUsYc
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2688
Identification confirmed by Dean Grubbs (FSU)
IUCN Red List: Vulnerable
https://www.iucnredlist.com/ja/species/39368/2908817
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/carcharhinus-brevipinna/
https://myfwc.com/wildlifehabitats/profiles/saltwater/sharks/spinner-shark/
Credits: entry-Pilotfish; editing-Erin Burge; screen grab-Pilotfish, SoundFisher; video-CamOp Scout, Pilotfish, RiverRider, Erin Burge

Common name: Spot-fin Porcupinefish
Scientific name: *Diodon hystrix* Linnaeus, 1758
Family: Diodontidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qJxNcafl3dHO0t4qMluGG7
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2451
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/193668/97664783
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/diodon-hystrix/
http://animaldiversity.org/accounts/Diodon_hystrix/
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Zeba Knight, alpha, Madduck1, meryl, BearBell, Sky Pilot, CamOp Scout; video-Erin Burge

Common name: Spot
Scientific name: *Leiostomus xanthurus* Lacepède, 1802
Family: Sciaenidae
Similar species: Tomtate (*Haemulon aurolineatum*)
Spottail Pinfish (*Diplodus holbrookii*)
Scup (*Stenotomus chrysops*)
Gray Snapper (*Lutjanus griseus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qDTk-uGp1bBnqVQmloJ-Is
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3786
IUCN Red List: Least Concern
https://www.iucnredlist.org/species/193267/82666940
Additional information:
https://www.chesapeakebay.net/S=0/fieldguide/critter/spot
https://animaldiversity.org/accounts/Leiostomus_xanthurus/
Credits: entry-Pilotfish and Erin Burge; editing-Erin Burge; screen grab-AlliCat93, Pilotfish, irwinamy43, CamOp Xavier, 5girls, Erin Burge; video-Erin Burge

Common name: Spotfin Butterflyfish
Scientific name: *Chaetodon ocellatus* Bloch, 1787
Family: Chaetodontidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o8v9F6aOajouSt27JYNTN6
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3843
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/165611/6067709
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/spotfin/spotfin.html
http://reefguide.org/carib/spotfinbutter.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-jon-newbie

Common name: Spotfin Hogfish
Scientific name: *Bodianus pulchellus* (Poey, 1860)
Family: Labridae
Similar species: Spanish Hogfish (*Bodianus rufus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6of6qbxJIb5UtqUOiEsSCID
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3886
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187570/8571598
Additional information:
http://eol.org/pages/212987/media
https://www.georgiaaquarium.org/animal-guide/georgia-aquarium/home/galleries/ocean-voyager/gallery-animals/spotfin-hogfish
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-meryltje, jon-newbie; video-jon-newbie

Common name: Spottail Pinfish
Scientific name: *Diplodus holbrookii* (Bean, 1878)
Family: Sparidae
Similar species: Tomtate (*Haemulon aurolineatum*)
Bermuda Chub (*Kyphosus sectatrix*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rABX7tR6i7oPaZFCQyVtMq
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3756
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/170264/1305162
Additional information:
http://www.marinefishesofgeorgia.org/reef-fish/spottail-pinfish.html
http://www.wilmingtondiving.com/spottailpinfish.shtml
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-John Rainey, Happywho, AlliCat93; video-jon-newbie, Erin Burge

Common name: Spotted Eagle Ray
Scientific name: *Aetobatus narinari* (Euphrasén, 1790)
Family: Myliobatidae (Class Chondrichthyes)
Similar species: Giant Manta (*Mobula birostris*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pqn8Q_JGoA7tRvhDvpvNXV
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/263
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/39415/10231645
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/aetobatus-narinari/
https://animaldiversity.org/accounts/Aetobatus_narinari/
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Zeba Knight, meryl, Erin Burge; video-Sky Pilot, Zeba Knight, Erin Burge

SharkCam Fishes

Common name: Spotted Goatfish
Scientific name: *Pseudupeneus maculatus* (Bloch, 1793)
Family: Mullidae
Similar species: Yellow Goatfish (*Mulloidichthys martinicus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qxjDoxYTba88I7_e3kN7Ns
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3833
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16545086/16546282
Additional information:
http://www.eoearth.org/view/article/156224/
http://reefguide.org/carib/spottedgoat.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryl, Erin Burge; video-jon-newbie, Erin Burge

Common name: Spotted Moray
Scientific name: *Gymnothorax moringa* (Cuvier, 1829)
Family: Muraenidae
Similar species: Purplemouth Moray (*Gymnothorax vicinus*)
Sharptail Eel (*Myrichthys breviceps*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oEroahSzuvYK6KTpo00ju5
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2798
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/195762/2414442
Additional information:
http://reefguide.org/carib/spottedmoray.html
http://www.snorkelstj.com/spotted-moray-eel.html
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, meryl; video-jon-newbie, Erin Burge

Common name: Spotted Scorpionfish
Scientific name: *Scorpaena plumieri* Bloch, 1789
Family: Scorpaenidae
Similar species: Oyster Toadfish (*Opsanus tau*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ppYPtMjKfw-wth8y3HHOWr
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3429
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16779308/16782173
Additional information:
http://reefguide.org/carib/scorpion.html
https://www.flmnh.ufl.edu/fish/discover/species-profiles/scorpaena-plumieri/
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, 5girls, BearBell, CajunSurfer, stilling, The Wine Guy; video-jon-newbie, Erin Burge, CamOp Scout, sam – obx nc

Common name: Spotted Trunkfish
Scientific name: *Lactophrys bicaudalis* (Linnaeus, 1758)
Family: Ostraciidae
Similar species: Scrawled Cowfish (*Acanthostracion quadricornis*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pF8tLpfmGbD1sR4NL7ebo9
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4384
Note: In earlier editions of the Guide, this species was misidentified as smooth trunkfish, *Lactophrys triqueter*. SharkCam viewer and underwater photographer Kevin Bryant (https://www.flickr.com/people/mentalblock/), suggested the revision.
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190106/1940651
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=176&menuentry=soorten
https://reefguide.org/carib/spottedtrunk.html
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/4384
Credits: entry-Erin Burge; editing-Courtney Burge, Kevin Bryant, Pilotfish; screen grab-Zeba Knight, Erin Burge; video-Erin Burge

Common name: Squirrelfish
Scientific name: *Holocentrus adscensionis* (Osbeck, 1765)
Family: Holocentridae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pVcY4ifSSx3EXa4NDfdLYX
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3352
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16442472/16509817
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/squirrelfish/squirrelfish.html
https://en.wikipedia.org/wiki/Holocentrus_adscensionis
Credits: entry-Christopher O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryl, Pilotfish; video-Erin Burge, Pilotfish

Common name: Stoplight Parrotfish
Scientific name: *Sparisoma viride* (Bonnaterre, 1788)
Family: Scaridae
Similar species: initial phase Redband Parrotfish (*Sparisoma aurofrenatum*)
initial phase Yellowtail Parrotfish (*Sparisoma rubripinne*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o7KemUzb3IvjyNQc3KmoDG
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3926
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190734/17779745
Additional information:
https://www.flmnh.ufl.edu/fish/Gallery/Descript/SParrotfish/SParrotfish.html
http://www.snorkelstj.com/stoplight-parrotfish.html
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab-pine-butte, jon-newbie, CamOp Xavier, 5girls, stilling, Erin Burge; video-Erin Burge

Common name: Striped Grunt
Scientific name: *Haemulon striatum* (Linnaeus, 1758)
Family: Haemulidae
Similar species: Tomtate (*Haemulon aurolineatum*)
Boga (*Haemulon vittatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qduyIq1wgGZ28KpDj8f7s-
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3729
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/155163/115279009
Additional information:
http://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3729
http://www.fishdb.co.uk/findpicture.php?exact=true&picid=2359
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie, meryl, AlliCat93; video-jon-newbie, Erin Burge

Common name: Striped Parrotfish
Scientific name: *Scarus iseri* (Bloch, 1789)

Appendix 1 – Additional information

Family: Scaridae
Similar species: initial phase Princess Parrotfish (*Scarus taeniopterus*)
juvenile Redband Parrotfish (*Sparisoma aurofrenatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pg6PNTZYcPCsn0J16saRl0
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3916
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190732/17782171
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=251
https://sta.uwi.edu/fst/lifesciences/documents/Scarus_iseri.pdf
Credits: entry-Gary Sturm and Erin Burge; editing-Erin Burge; screen grab-BearBell, s_TpaMan, Pilotfish, AlliCat93; video-jon-newbie

Common name: Surgeonfishes
Scientific name: *Acanthurus* spp.
Family: Acanthuridae
Similar species: Adult Blue Tang (*Acanthurus coeruleus*)
Doctorfish (*Acanthurus chirurgus*)
Ocean Surgeon (*Acanthurus tractus*)
Note: Reference books and online resources have historically used the scientific name *Acanthurus bahianus* for the entire geographic range of the ocean surgeon. It was recently proposed that the northwestern Atlantic *A. bahianus* is actually *A. tractus* (ocean surgeon), and that *A. bahianus* (ocean surgeonfish) be reserved for the Brazilian population. See Bernal and Rocha (2011) for more detail.
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6px6FuQDeSocEewGQNOomrb
Authentication:
Blue Tang, FishBase (mirror)
Doctorfish, FishBase (mirror)
Ocean Surgeon, FishBase (mirror)
http://www.marinespecies.org/aphia.php?p=taxdetails&id=301914
http://www.mapress.com/zootaxa /2011/f/zt02905p068.pdf
IUCN Red List: Least Concern
See individual entries for Blue Tang, Doctorfish, and Ocean Surgeon
Additional information:
Blue Tang, http://reefguide.org/carib/bluetang.html
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=208
Doctorfish, http://reefguide.org/carib/doctorfish.html
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=209
Ocean Surgeon, http://www.mapress.com/zootaxa/2011/f/zt02905p068.pdf for discussion of the differences between *Acanthurus tractus* and *Acanthurus bahianus*, http://reefguide.org/carib/surgeonfish.html
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=207
Credits: entry-jon-newbie; editing-Erin Burge; screen grab-jon-newbie; video-jon-newbie

T

Common name: Tarpon
Scientific name: *Megalops atlanticus* Valenciennes in Cuvier and Valenciennes, 1847
Family: Megalopidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oXFpp5fcE2TAEwfG0ASS5I
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/2522
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/191823/2006676
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/megalops-atlanticus/
http://www.dnr.sc.gov/marine/species/tarpon.html
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Zeba Knight, jon-newbie, Erin Burge, BearBell, Pilotfish; video-jon-newbie, Erin Burge

Common name: Tautog
Scientific name: *Tautoga onitis* (Linnaeus, 1758)
Family: Labridae
Similar species: Black Sea Bass (*Centropristis striata*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6q_SZ1GkB5GOhdd8_zCPQMB
Authentication: FishBase (mirror)
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/187479/8547027
Additional information:
http://www.mass.gov/eea/agencies/dfg/dmf/recreational-fishing/species-profiles-tautog.html
http://www.saltwatersportsman.com/species/fish-species/tips-catching-trophy-tog
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-John Rainey, cynde, jon-newbie; video-jon-newbie

Common name: Tiger Shark
Scientific name: *Galeocerdo cuvier* (Péron and Lesueur in Lesueur, 1822)
Family: Carcharhinidae (Class Chondrichthyes)
Similar species: see Positive identification of sharks
Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)
Bull Shark (*Carcharhinus leucas*)
Great White Shark (*Carcharodon carcharias*)
Lemon Shark (*Negaprion brevirostris*)
Nurse Shark (*Ginglymostoma cirratum*)
Sand Tiger Shark (*Carcharias taurus*)
Sandbar Shark (*Carcharhinus plumbeus*)
Spinner Shark (*Carcharhinus brevipinna*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rMB1G1vnNXVGS3gF1gM5n-
Note: Only one tiger shark has been definitively identified from SharkCam, and the angle of viewing does not show the blunt nose and large eyes well. It does, however, show the presence of the longitudinal keel, a feature shared only with the great white shark, among SharkCam sharks. The individual seen in the images was recorded on 27 June 2016 (https://youtu.be/nz_-HZ7CVvs). SharkCam volunteer UWStig recorded a video (https://youtu.be/Cv9HlFe13hY) on site at Frying Pan Tower the afternoon of 27 June that also is clearly of a tiger shark, likely the same individual.
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/103
IUCN Red List: Near Threatened
https://www.iucnredlist.com/species/39378/10220026
Additional information:
https://www.floridamuseum.ufl.edu/fish/discover/species-profiles/galeocerdo-cuvier
https://oceana.org/marine-life/sharks-rays/tiger-shark

SharkCam Fishes

Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Erin Burge; video-Jangsara, jon-newbie, UWStig

Common name: Tomtate
Scientific name: *Haemulon aurolineatum* Cuvier in Cuvier and Valenciennes, 1830
Family: Haemulidae
Similar species: Spottail Pinfish (*Diplodus holbrookii*)
Bigeye Scad (*Selar crumenophthalmus*)
Round Scad (*Decapterus punctatus*)
Striped Grunt (*Haemulon striatum*)
Boga (*Haemulon vittatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pfsZ_OrbDZhb_ku_pVK-BJ
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3718
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190481/115324762
Additional information:
http://www.sms.si.edu/irlspec/Haemul_auroli.htm
http://www.dto.com/swfishing/speciesProfile/487
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-John Rainey, jon-newbie, Sky Pilot, Zeba Knight; video-jon-newbie

Common name: Trumpetfish
Scientific name: *Aulostomus maculatus* Valenciennes, 1837
Family: Aulostomidae
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p3wjkwu9FMFVjHA9rWgPOv
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3370
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16421352/16509812
Additional information:
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/aulostomus-maculatus/
https://www.lamar.edu/arts-sciences/biology/marine-critters/marine-critters-2/trumpetfish.html
Credits: entry-Erin Burge; editing-Courtney Burge; screen grab-Erin Burge, Jangsara; video-Erin Burge

U

V

Common name: Vermilion Snapper
Scientific name: *Rhomboplites aurorubens* (Cuvier in Cuvier and Valenciennes, 1829)
Family: Lutjanidae
Similar species: Bigeye Scad (*Selar crumenophthalmus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p7y91eDSCDVwrVAeSCZh2v
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3699
IUCN Red List: Vulnerable
https://www.iucnredlist.com/species/190138/1941553
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/snapper/vermilion-snapper/
Guide to South Carolina Saltwater Fishes, page 76, http://saltwaterfishing.sc.gov/pdf/SaltwaterFishPocketGuide.pdf
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, SusannMesna, meryl, 5girls; video-jon-newbie, Erin Burge

W

Common name: Warty Comb Jelly
Scientific name: *Mnemiopsis leidyi* Agassiz, 1865
Family: Bolinopsidae (Phylum Ctenophora, Class Tentaculata)
Note: This species was provisionally identified as *Beroe ovata* in earlier editions of this guide. Additional sightings and consultations with Dr. Rob Condon (Young Scientist Academy) suggested that the original identification be revised. This species is also known as the sea walnut.
Similar species: Moon Jelly (*Aurelia aurita*)
Sea Wasp (*Alatina alata*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6o9DX3dT0iBFNSLes50i_3C
Authentication: SeaLifeBase
IUCN Red List: Not Listed
Additional information:
https://www.vims.edu/bayinfo/jellyfish/guide/mnemiopsis.php
https://www.cabi.org/isc/datasheet/75102
Credits: entry-Olivia Bertelsen, Pilotfish and Erin Burge; editing-Pilotfish, Erin Burge; screen grab-Olivia Bertelsen, Pilotfish; video-Olivia Bertelsen, Pilotfish, Erin Burge

Common name: West Indian Sea Egg
Scientific name: *Tripneustes ventricosus* (Lamarck, 1816)
Family: Toxopneustidae (Phylum Echinodermata, Class Echinoidea)
Similar species: None
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6q3u6nFzfdMKzEFfp7QAgnh
Authentication: SeaLifeBase
https://en.wikipedia.org/wiki/Tripneustes_ventricosus
IUCN Red List: Not Listed
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=386
http://reefguide.org/carib/westindianseaegg.html
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, UWStig; video-jon-newbie, UWStig

Common name: White Grunt
Scientific name: *Haemulon plumierii* (Lacepède, 1801)
Family: Haemulidae
Similar species: White Margate (*Haemulon album*)
Black Margate (*Anisotremus surinamensis*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6rZJr7YdexE1kZ7msoWqhRr
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3727
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190132/1941346
Additional information:
http://myfwc.com/wildlifehabitats/profiles/saltwater/white-grunt/
https://en.wikipedia.org/wiki/Haemulon_plumierii
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, cynde, OKI, meryl, jterr, paz; video-jon-newbie, Erin Burge

Common name: White Margate
Scientific name: *Haemulon album* Cuvier in Cuvier and Valenciennes, 1830
Family: Haemulidae
Similar species: White Grunt (*Haemulon plumierii*)
Black Margate (*Anisotremus surinamensis*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6quKBeeiJ7bVbdP-E0bjka2

Appendix 1 – Additional information

Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3717
IUCN Red List: Data Deficient
https://www.iucnredlist.org/species/190206/1944164
Additional information:
https://reefguide.org/keys/whitemargate.html
https://en.wikipedia.org/wiki/Haemulon_album
Credits: entry-Erin Burge; editing-Pilotfish; screen grab-Pilotfish, BearBell, Erin Burge, Meowsmix; video-Erin Burge

Common name: Whitefin Sharksucker
Scientific name: *Echeneis neucratoides* Zuiew, 1789
Family: Echeneidae
Similar species: Sharksucker (*Echeneis naucrates*)
juvenile Cobia (*Rachycentron canadum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6ppG4jUECgg437j4iSQKG37
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3636
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/16440083/115359156
Additional information:
http://reefguide.org/carib/whitefinsharksucker.html
http://www.iucnredlist.com/details/16440083/0
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie; video-Erin Burge

Common name: Whitespotted Soapfish
Scientific name: *Rypticus maculatus* Holbrook, 1855
Family: Serranidae
Similar species: Cubbyu (*Pareques umbrosus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6qMYG4xtwR09rZK9v1nRiWN
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3540
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16759353/16781863
Additional information:
http://www.wilmingtondiving.com/whitespotsoap.shtml
http://biogeodb.stri.si.edu/caribbean/resources/img/images/species/3540_1252.jpg
Credits: entry-Christopher O'Brien; editing-jon-newbie and Erin Burge; screen grab-Erin Burge, jon-newbie, Jessica Pollack; video-jon-newbie, Erin Burge

X

Y

Common name: Yellow Jack
Scientific name: *Carangoides bartholomaei* (Cuvier in Cuvier and Valenciennes, 1833)
Note: Many sources use the alternate scientific name *Caranx bartholomaei* for the yellow jack. We have followed the current classification for this species from the Integrated Taxonomic Information System.
Family: Carangidae
Similar species: Horse-eye Jack (*Caranx latus*)
Blue Runner (*Caranx crysos*)
Bar Jack (*Carangoides ruber*)
Yellowtail Snapper (*Ocyurus chrysurus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pJLEaYoitc9tUT9qPe-Awf
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3637
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/16431725/16509662
Additional information:
https://en.wikipedia.org/wiki/Yellow_jack
https://www.flmnh.ufl.edu/fish/discover/species-profiles/carangoides-bartholomaei/
Credits: entry-Chris O'Brien; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje; video-jon-newbie

Common name: Yellow Goatfish
Scientific name: *Mulloidichthys martinicus* (Cuvier in Cuvier and Valenciennes, 1829)
Family: Mullidae
Similar species: Spotted Goatfish (*Pseudupeneus maculatus*)
Yellowtail Snapper (*Ocyurus chrysurus*)
Horse-eye Jack (*Caranx latus*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6p4vM6ke6PQMrP0lOeJ0iKO
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3830
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190429/1951474
Additional information:
http://species-identification.org/species.php?species_group=caribbean_diving_guide&id=173
http://thewebsiteofeverything.com/animals/fish/Perciformes/Mullidae/Mulloidichthys-martinicus
Credits: entry-Gary Sturm; editing-Erin Burge; screen grab-jon-newbie, Erin Burge, mrbuck; video-jon-newbie, Erin Burge

Common name: Yellowhead Wrasse
Scientific name: *Halichoeres garnoti* (Valenciennes in Cuvier and Valenciennes, 1839)
Family: Labridae
Similar species: See Positive Identification of SharkCam Wrasses
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pd3MM8sglzL1YFt0N9AET6
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3897
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/187724/8613456
Additional information:
http://www.eoearth.org/view/article/157184/
http://reefguide.org/carib/yellowheadwrasse.html
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, lingo13, BearBell; video-Erin Burge

Common name: Yellowtail Parrotfish
Scientific name: *Sparisoma rubripinne* (Valenciennes in Cuvier and Valenciennes, 1840)
Family: Scaridae
Similar species: Redband Parrotfish (*Sparisoma aurofrenatum*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6oh18Sqk77UkLzByB_Dgwry
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3925
IUCN Red List: Least Concern
https://www.iucnredlist.com/species/190721/17783950
Additional information:
http://reefguide.org/carib/yellowtailparrot.html
http://www.snorkelstj.com/redfin-yellowtail-parrotfish.html
Credits: entry-Randy Fink; editing-jon-newbie and Erin Burge; screen grab- Erin Burge, jon-newbie, meryltje, tis-me; video-jon-newbie

Common name: Yellowtail Snapper
Scientific name: *Ocyurus chrysurus* (Bloch, 1791)
Family: Lutjanidae
Similar species: Horse-eye Jack (*Caranx latus*)

SharkCam Fishes

Yellow Jack (*Carangoides bartholomaei*)
YouTube: https://www.youtube.com/playlist?list=PLK1g13VpyT6pWuw7EcAspJLaaXzz5GD-R
Authentication: FishBase (mirror)
https://biogeodb.stri.si.edu/caribbean/en/thefishes/species/3695
IUCN Red List: Data Deficient
https://www.iucnredlist.com/species/194341/2316114
Additional information:
http://www.flmnh.ufl.edu/fish/gallery/descript/yellowtailsnapper/yellowtailsnapper.html
https://en.wikipedia.org/wiki/Yellowtail_snapper
Credits: entry-John Rainey; editing-jon-newbie and Erin Burge; screen grab-jon-newbie, meryltje, pinebutte; video-jon-newbie

Z

Seven sand tigers *Carcharias taurus* are visible in this image from 13 December 2021. Image credit: Explore.org/5girls

Appendix 1 – Additional information

A masked booby *Sula dactylatra* resting on the helipad at Frying Pan Tower. This is an unusual visitor rarely seen beyond the tropical Atlantic. Image credit: Explore.org Tower Cam

The research vessel NOAA Ship Nancy Foster (R 352) made a visit to the Frying Pan Tower area on 3 September 2020. Image credit: Explore.org Tower Cam/BearBell

APPENDIX 2 – HISTORY OF SHARKCAM

Trevor Mendelow (left) and Jim Atack (right) discuss the installation of SharkCam from the living area on Frying Pan Tower. Image credit: Erin Burge

Richard Neal (left) and David Wood (right) prep SharkCam for deployment from the deck of Frying Pan Tower 80 feet above the ocean. Image credit: Erin Burge

For both avid viewers and relative newcomers to SharkCam, we thought you might like to know a little history about the changes that have occurred since the original camera installations in August of 2014.[15]

Participants at the initial installation included Trevor Mendelow, Richard Neal, Jim Atack, Erin Burge, Zach Hart, and David Wood. Trevor is the designer of the pan-tilt-zoom underwater streaming webcams, self-cleaning apparatus, and transmission infrastructure[16] used in this project. Richard is the owner and operator of Frying Pan Tower[17] which hosts the camera and infrastructure offshore of North Carolina. Jim is captain of the vessel "In Sea State" which was used for camera installation and he directs diving operations for the project. Erin Burge is a Professor of Marine Science at Coastal Carolina University, and he was responsible for photo and video documentation of the installation. Zach Hart served as boat tender and dive assistant and David Wood assisted with topside engineering and logistical support for the original SharkCam installation.

On 31 August 2014 two cameras were installed. "Barracuda Cam" on a shallow horizontal support of the tower in about 15 feet (5 meters) of water and the original SharkCam, also on a horizontal support at 50 feet. Both cameras faced out from on top of the horizontal pipe.

In some ways the divers that maneuvered the two cameras into position, chained them to the tower supports, and connected the data and power cables had the easy jobs. On the other hand, they did have to contend with curious visitors to the aptly named installation.[18] Much more above-water work involved running cable from atop Frying Pan Tower, positioning solar panels for power and transmission dishes for landward transfer of the video streams, and securing the rights to install transmission hardware atop the 1,955 foot (600 meter) Winnabow Cosmos Broadcasting Tower onshore in North Carolina.

Both cameras went live on Explore.org in September 2014 after installation, tower infrastructure, and the land-side hardware were completed.

The onset of winter 2014–2015 brought storms and large waves to Frying Pan Tower and both cameras went offline in late January 2015. A camera reboot revealed that Barracuda Cam was hanging upside-down and swinging from the tower horizontal. SharkCam was also loose on its mooring. Barracuda Cam ceased transmission soon after.

Once sea conditions allowed, a diver maintenance team (Atack, Burge, and Frederick Farzanegan) traveled to Frying Pan Tower on 8 March 2015, and discovered that Barracuda Cam was completely destroyed and SharkCam needed

[15] See SharkCam Timeline for key events and participants at the end of this section.
[16] For details on the technical specifications and applications of these cameras visit http://viewintotheblue.com/.
[17] For more information on Frying Pan Tower, including a history of the structure, see https://fptower.org/.
[18] See https://www.youtube.com/watch?v=EahO0qFmvlI for sharks and other visitors seen during installation activity.

a thorough cleaning and replacement of the data and power cable. The cable was damaged by chafing against the hard structure of the tower during storms. SharkCam and its cabling were removed during this visit.

A team was able to return to Frying Pan Tower (Atack, Burge, Farzanegan, and Adam Greene) on March 22 and the now thoroughly cleaned and repaired SharkCam was reinstalled at 50 feet. During reinstallation, maintenance divers were also tasked with rotating SharkCam to an upside-down position beneath the tower horizontal.[19] This was done to reduce the possibility of damage and to allow the camera to better "see" the bottom where much of the fish activity takes place. Routine underwater maintenance by those previously mentioned and others (Matt Davin, Steve Luff, Reed Winn, and Sondra Vitols) continued through the rest of 2015 and into 2016.

During the spring of 2016 SharkCam 2.0 was damaged and the cleaner bar assembly ceased functioning correctly. Video evidence showed an octopus crawling on the camera housing, and the cleaning bar malfunction became apparent shortly thereafter. Octopuses are curious and strong, and it is possible that this Frying Pan Tower visitor is to blame for the malfunction. Consequently, algae and other organisms built up quickly on the transparent dome enclosing the camera. Several maintenance trips by boat or with divers deployed directly from Frying Pan Tower during the spring and early summer attempted to keep up with the growth, but the view was obstructed for much of the summer season.

On 12 August 2016, Atack, Burge, Luff, and Vitols participated in a removal of SharkCam 2.0, and installation of a new and upgraded high definition (HD) SharkCam 3.0. The HD camera installation was accompanied by installation above and below water of an enclosed conduit that runs along the vertical leg of the tower to the depth of SharkCam. The power and data cabling were routed through this conduit and the conduit strongly attached to the tower leg. This reduced chafing on the data cable and further protected the installation. Above water installation of the conduit was accomplished by Neal and Saylor Vann.

Early September 2016 saw the arrival of Tropical Storm Hermine to the Carolina coast. Although SharkCam 3.0 was not yet broadcasting online because of maintenance needed at the Winnabow tower onshore, the underwater data and power cable were damaged again. On 10 September 2016, Atack and Burge, below water, and Neal and Brooke Briza, above water, swapped out the damaged

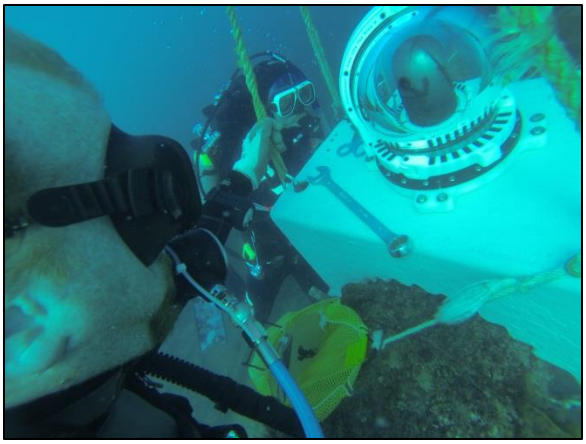
March 22, 2015. Jim Atack works to remove the stand from the broken Barracuda Cam. Image credit: Erin Burge

Richard Neal examines the fouling on SharkCam after removal in January 2017. Image credit: David Wood

Erin Burge inspects the final installation of SharkCam 2.0 in March 2015. Image credit: Erin Burge

[19] For video footage of the March 22, 2015, SharkCam 2.0 installation visit https://www.youtube.com/watch?v=VZ9lVPUNRKY.

data cable. In water activities included tightening all of the fittings and hardware from the water line to the bottom, and surveying the footprint of Frying Pan Tower for future hazards to SharkCam. Communication between SharkCam 3.0 and Winnabow tower was briefly reestablished on 3 October 2016. Unfortunately, the arrival of Hurricane Matthew shortly thereafter again damaged the communications infrastructure and transmission ceased. Footage from atop Frying Pan Tower showed that sea conditions were perilous during the storm.[20]



Jim Atack (background) and Erin Burge maneuver SharkCam into position for secure attachment in April 2017.

Continued poor weather and logistical issues delayed a reconnaissance trip to Frying Pan Tower to assess damage until 15 January 2017. During that trip David Wood and Richard Neal handled top-side logistics while Jim Atack and Erin Burge removed the undamaged, but nonfunctional SharkCam 3.0.[21] A new camera was ready for installation on this trip, but short daylight and high currents precluded completing the work. Shark activity at the tower was also problematic during the removal of the camera and contributed to delays in reinstallation.[22] Finally, a reinstallation trip was scheduled for 9 April 2017, where a newly mounted camera was readied for deployment. Atack and Burge positioned the camera and reinstalled it with the help of boat tenders Dan Madigan and Doug Noble.[23] The camera was reinstalled closer to the vertical tower leg and rotated to an upright position because of a shortened data and power cable. Richard Neal and Saylor Vann completed the tower work. Live streaming was reestablished that same day.

Over the next month the video stream was tinkered with to recreate more surface-natural light conditions. As a result SharkCam videos now appeared as closer to natural sunlight conditions. This dramatically reduces the blue-green effect of the water and displays animals in more vibrant, full-spectrum color. One side effect of this color filtering is that still images are no longer as clear as they once were.

SharkCam continued broadcasting through the rest of the spring and into late summer of 2017. Unfortunately lightning strikes on the Winnabow tall tower that happened on 13 or 14 August 2017, damaged the radio receiver/transmitter that sends the video stream to Explore. The receiver transmitter was replaced on Winnabow tower on 19 November, with battery and solar panel work scheduled for Frying Pan Tower on 3 December. Winter storms precluded diving activities to re-enable live streaming through the end of the year.

Lightning over Wilmington, NC, as seen from the Explore.org Sky Cam in August 2017. Image credit: EAV

On 21 January 2018, Jim Atack, Erin Burge, Steve Luff, and Cody Sweitzer made the cold boat ride out to Frying Pan Tower to join Richard Neal who had arrived on the tower by helicopter on 20 January. This team was successful in removing the existing SharkCam, wrestling the new unit into position in heavy currents and cold water, and running the data/power cable from atop FPT to the bottom. Neal and Sweitzer handled top-side work while Atack and Burge, later joined by Sweitzer and Luff, installed the new SharkCam and

[20] Hurricane footage from the Tower Cam mounted above FPT https://www.youtube.com/watch?v=GGCjPJ-Y4b4 and media coverage http://www.cnn.com/videos/us/2016/10/08/shirtless-man-lounges-in-ocean-during-storm-orig.cnn

[21] SharkCam maintenance during January 2017 on Youtube https://youtu.be/5AHmYS5qnBc

[22] A tagged sand tiger shark seen during January 2017 maintenance https://youtu.be/EbdFTXpf41g

[23] Summary of in water activities during April 2017 reinstallation https://youtu.be/aJ_5mdtnQb0

Appendix 2 – History of SharkCam

ran cable underwater.[24] It began broadcasting online on 23 January. The first snapshot posted with the cam back up and running was of a sand tiger shark (*Carcharias taurus*)! SharkCam continued broadcasting until 27 April when part of the radio infrastructure on land failed.

The first posted screen grab from the January 2018 SharkCam reboot. A sand tiger shark (*Carcharias taurus*) 23 January 23, 3:38PM EST. Image credit: Explore.org/OKI

Radio repairs and replacement were completed and the online feed was restablished on 24 July 2018. In early August, Erin Burge accompanied Richard Neal and Tom Land via helicopter to the tower. The main goal of the visit was to prepare and install 10 higher wattage solar panels to augment the power infrastructure for the cameras and tower. On 5 August, Jim Atack arrived by boat, and he and Erin cleaned the SharkCam installation, replaced the chain hardware that secures the cam stand to the tower, and removed loose sections of the data and power cable. A footprint survey of FPT was completed and Neal, Land, and Burge rode back to shore with Atack and his family.

Frying Pan Tower from a helicopter on 3 August 2018. Image credit: Erin Burge

Beginning on 12 September the outer edges of Hurricane Florence, at the time a category 4 storm, began impacting Frying Pan Tower. As the wind and waves intensified, national news broadcasts picked up on the cam feeds, especially the Tower Cam above water. At times, over 190,000 viewers were simultaneously watching Explore.org and Youtube streams from FPT. The American flag on FPT was particularly popular and it generated thousands of comments from interested viewers. Transmission of SharkCam ceased late on 13 September followed in the early morning hours by Tower Cam on 14 September. Communication and streaming from the cameras was restablished late on 19 September and revealed that all three Explore.org cameras (SharkCam, Tower Cam, and Sky Cam)[25] survived the storm.

Hurricane Florence on approach to the SharkCam area 12 September 2018.

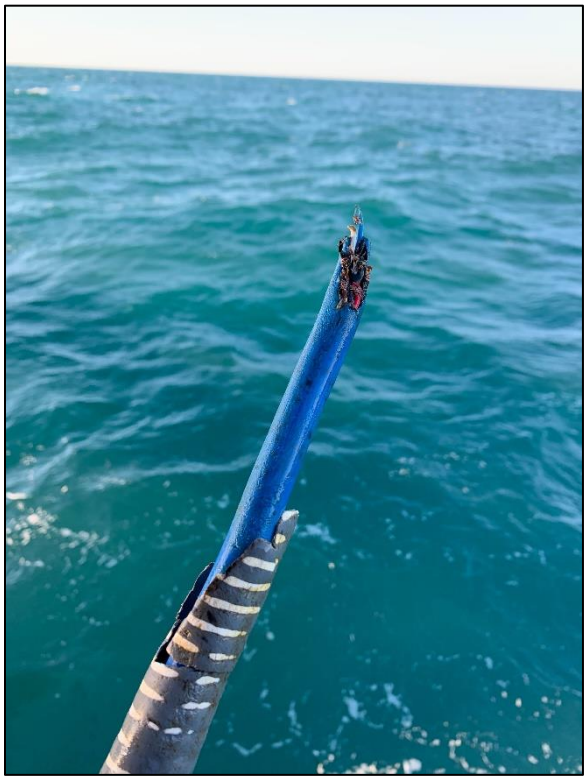
In preparation for cleaning and maintenance on SharkCam and a pending reinstallation of Barracuda Cam, Erin Burge and Kevin McWilliams joined Richard Neal and Saylor Vann for a delivery trip to Frying Pan Tower on 30 November. Capt. Vann piloted his new boat "Ronin" out to the tower with a cargo of 10 new solar panels, 20 new batteries for banking power, 65 gallons of fuel, and various additional

[24] A video summary of maintenance activities in January 2018 is available from https://youtu.be/qFQ5JNCc6OE.
[25] See Tower Cam (Frying Pan Tower Ocean View camera) from https://explore.org/livecams/frying-pan/frying-pan-cam and Sky Cam (Sky Tower near Wilmington, North Carolina) from https://explore.org/livecams/frying-pan/sky-tower.

supplies. Later that afternoon cam feeds from FPT ceased. This was due to a software configuration change associated with landside transmission.

A crew of Neal, Wood, Atack, Burge, and David Kish returned to FPT on 13 December to replace the cleaner arm on SharkCam and reinstall Barracuda Cam on the 15' horizontal. A Vemco acoustic receiver used to detect tags in large mobile marine animals was also placed on the walkway grate in the large sand patch viewed from SharkCam. The receiver is on loan from the Smithsonian Environmental Research Center in Maryland. Transmission and streaming of the feeds resumed the evening of 4 January 2019. A great white shark was spotted for the first time within a few days (9 January), but as January came to a close views became more and more obstructed due to fouling on the transparent dome of SharkCam. Transmission radio issues in late January knocked the cam off-line. On 24 March, Richard Neal, Jim Atack, Erin Burge, and Cody Sweitzer returned to Frying Pan Tower to remove the camera and redeploy a new model. Neal and Sweitzer handled the top-side work while Atack and Burge worked underwater. Unfortunately, the power and data transmission cable was active when it was attached to the new installation, and the surge in power damaged delicate components in the camera. Acoustic receiver data was harvested. Tags were detected from several sand tiger sharks tagged in Delaware, one of which remained at FPT for over 100 days that winter. Additionally, several tags from great white sharks tagged in Long Island were also present, along with a short visit from a tagged tiger shark. Not until after Hurricane Dorian, on 13 October, Jim and Brian Atack, and Erin Burge by boat, met Richard Neal and several FPT volunteers already on site. This group deployed and installed a new cable and SharkCam on the bottom. Streaming started almost immediately, catching glimpses of maintenance divers on site. New species discovered shortly thereafter included an unexpected visit from a small green sea turtle, and several new fish species. After a couple of months of operation, SharkCam ceased transmitting on (7?) 9 December 2019, and a visit near the turn of the year revealed that the data and power cable was severed.

Sea conditions and the American flag at Frying Pan Tower on 13 September 2018 as seen from Explore.org Tower Cam (https://explore.org/livecams/frying-pan/frying-pan-cam). This cam feed was broadcast worldwide during media coverage of the impacts of Hurricane Florence on the southeastern United States. This flag, inexplicably nicknamed "Kevin" by denizens of the Internet, was auctioned on eBay for a $10,900 donation to the Red Cross. Image credit: Explore.org Tower Cam



Severed cable that caused the transmission interruption in December after the October 2019 deployment. Image credit: Richard Neal/FPT

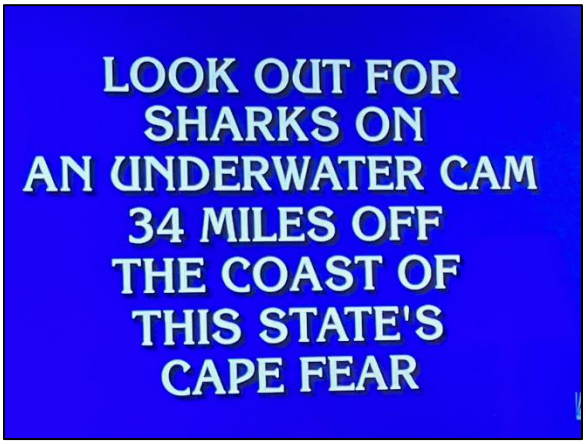
Winter weather, the arrival of the COVID-19 pandemic, and the subsequent national closures and physical distancing requirements made boat travel to Frying Pan Tower difficult through much of 2020. Richard Neal was able to deploy a dangling camera at about the depth of the old Barracuda Cam on 16 April. It revealed views of the upper water column fishes and remained operational until 22 August when it was pulled for cleaning and prepped for redeployment as a new SharkCam. Richard Neal and volunteers also installed a protected conduit to route the camera power/data cable safely down from FPT and across the surf zone to the depth of the SharkCam installation at about 45'. On 23 August 2020, a dive team of Jim Atack, Erin Burge, Steve Luff, and Stephen Seeber joined Richard Neal and Frying Pan Tower volunteers already on site for reinstallation

of SharkCam.[26] Installation involved siting the camera and running the power/data cable from FPT, through the conduit, and securely attaching it below the waterline. These tasks were successful but the cleaner arm did not function once the camera was in place. The acoustic receiver data was harvested and after submission to the regional database the report revealed that FPT was visited by six tagged white sharks and three sand tigers that were tagged by the North Carolina Aquariums. One of the sand tigers stayed at SharkCam for over 120 days in 2020–21.

One of the many SharkCam cleaners that have kept our views unobstructed in 2020 and 2021. Image credit: Explore.org/5girls

Even without an operational cleaner arm, Neal, FPT volunteers, and local divers have kept up with manual cleaning of the camera dome through the rest of 2020 and 2021. This operational cycle (September 2020–present, late December 2021) is the longest the camera has remained operational in its history.

On 14 August 2021, Richard Neal installed a solar-powered high-intensity "night light" that was active for 1–2 hours each evening (and occassionally pre-sunrise) through the end of September and occasionally in October, and December. This view led to several new species discoveries, more frequent visits from seemingly rare species that are nocturnal hunters, especially moray eels, soapfishes, and spiny lobsters, and showed many predatory behaviors that had previously not been seen.



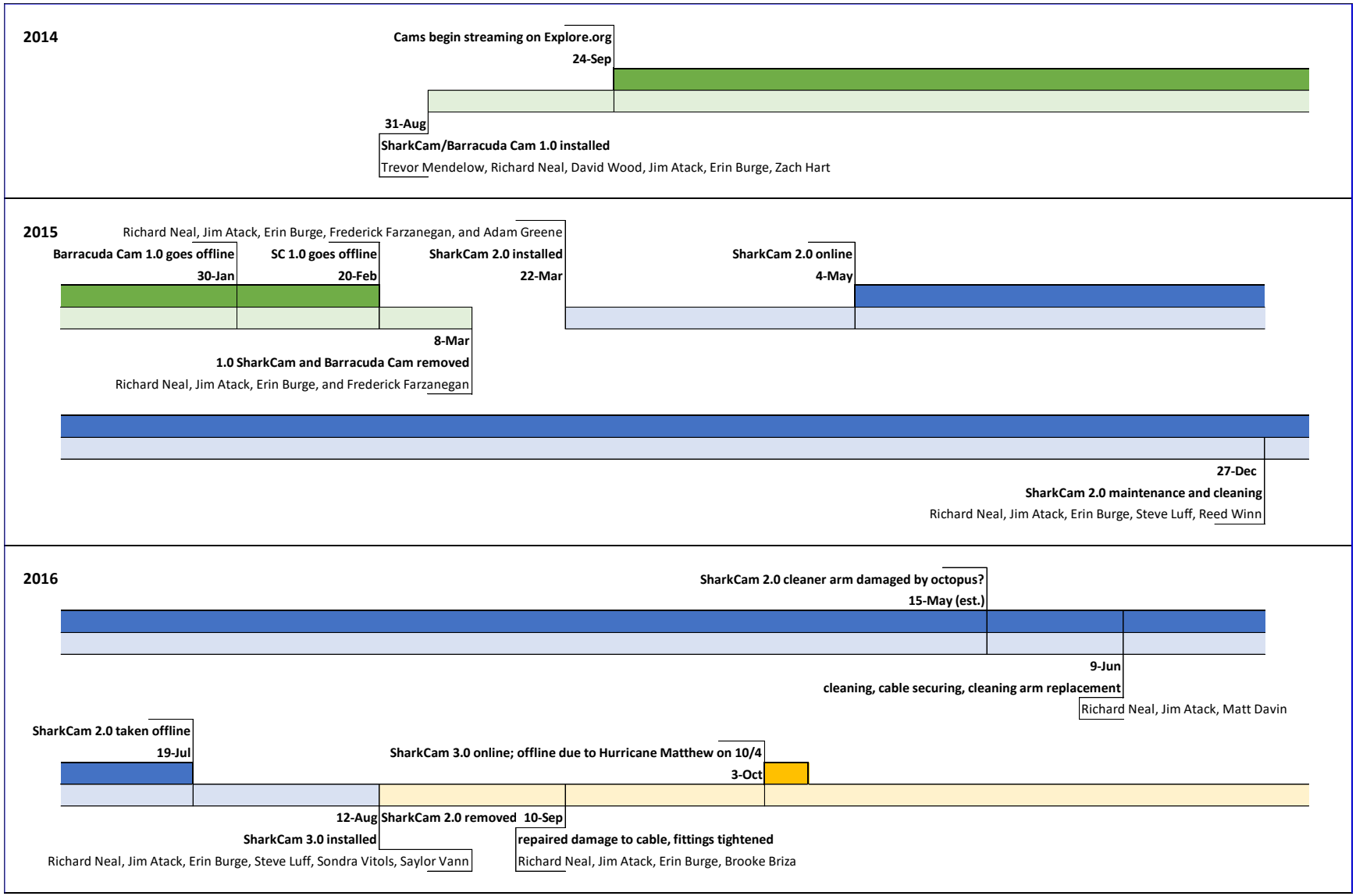
This $1000 Jeopardy clue in the category Webcams aired on 29 September 2021 during season 38, episode 13. Image credit: Jeopardy!/Ryan Ware

In September 2021, an undergraduate student who worked with Erin Burge, Ryan Ware, sent an email that included a screenshot of a SharkCam-based clue from the television game show, "Jeopardy!". The correct question (of course) was "What is North Carolina?"

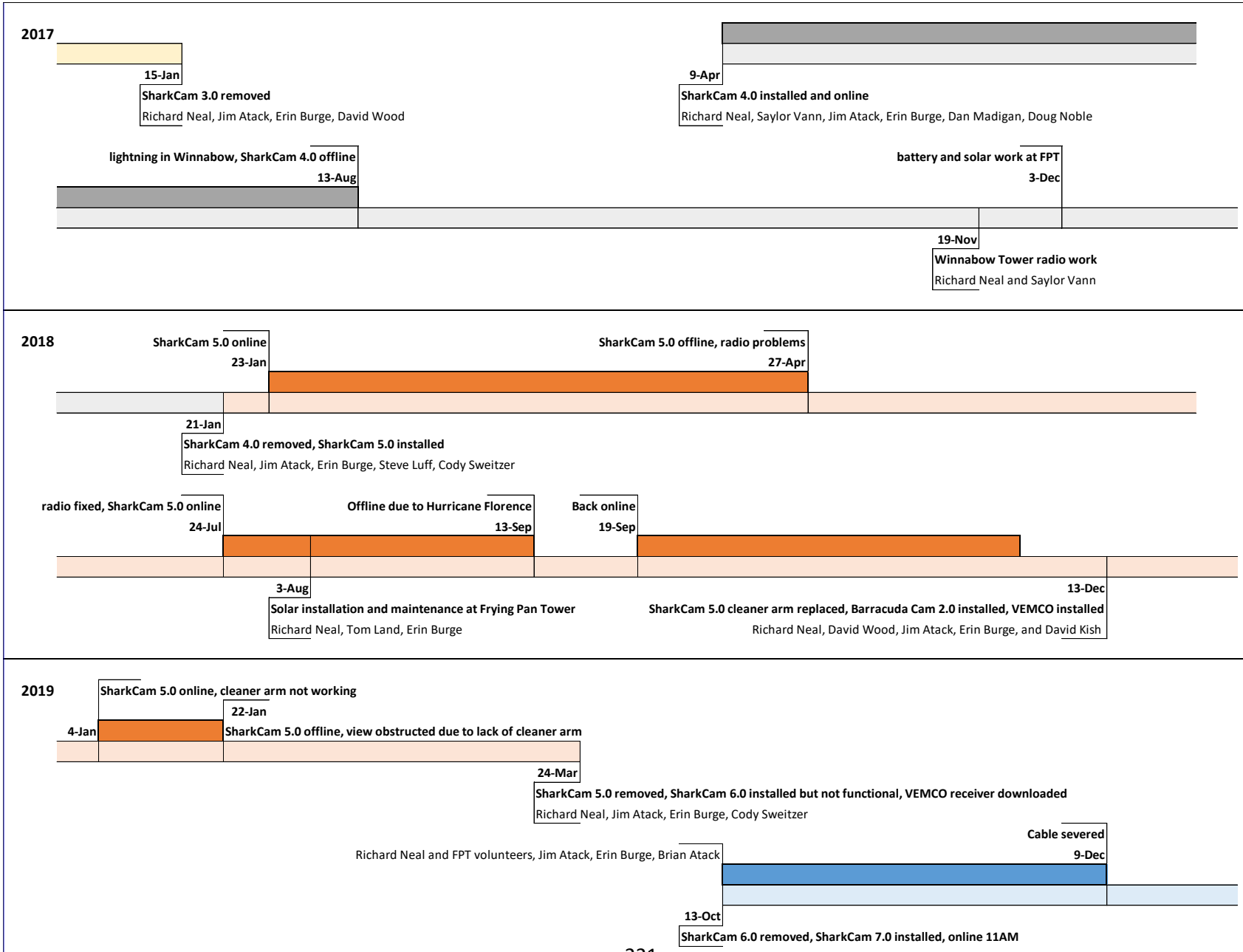
During the long interval that SharkCam has been operational in 2020 and 2021, we have "discovered" two new shark species, had another on-camera visit from a great white, and added 12 new fishes and four new "Not Fishes" to the list of species seen on SharkCam.

[26] A video summary of maintenance activities on 23 August 2020 is available at https://youtu.be/-bhCT23-xpk.

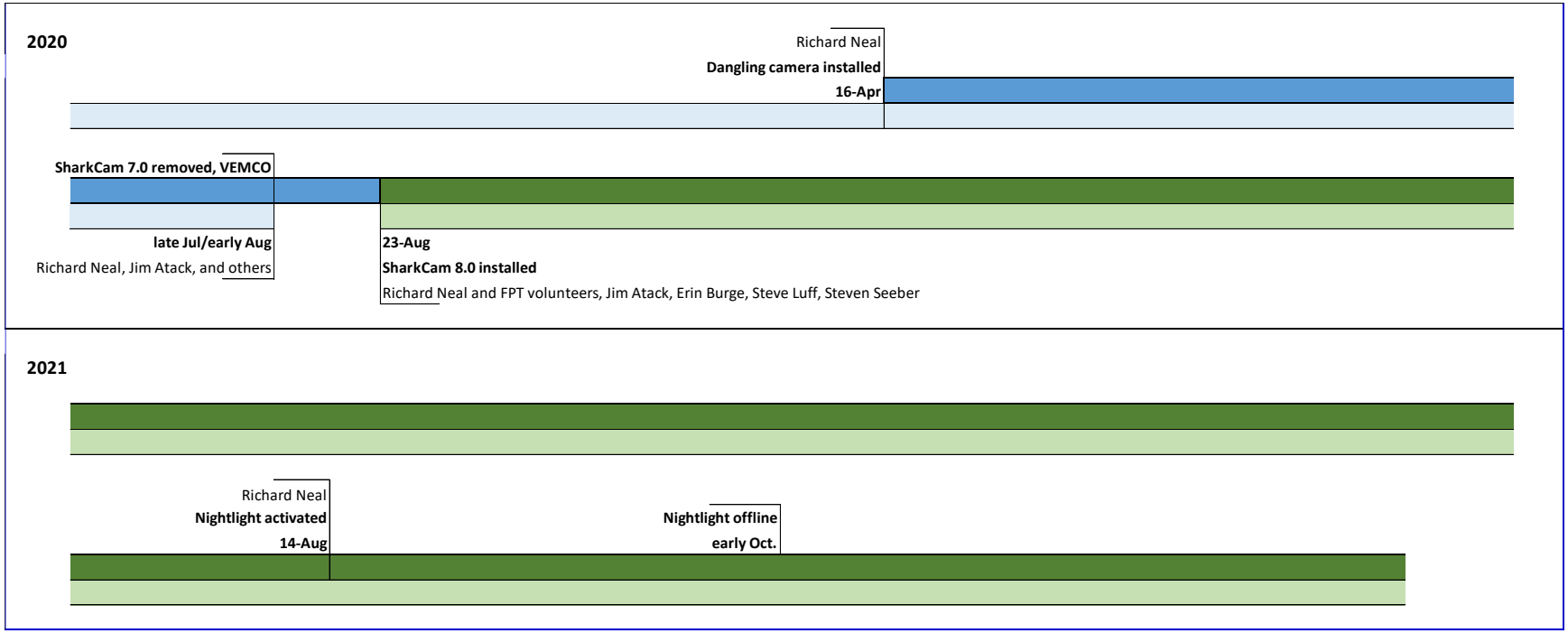
SharkCam Timeline



SharkCam Timeline



SharkCam Timeline



Richard Neal cleaning the SharkCam dome 28 Febuary 2021 . Image credit: Explore.org/bobolink-IL

SCIENTIFIC AND COMMON NAMES INDEX

Note: Index entries refer to main entries in the Identification Images, Species Profiles, and Additional Information sections. Similar species are listed within each Species Profile. **Taxon names and scientific names are bolded.**

SharkCam Fishes

Scientific and Common Names Index

A tornado of round scad (*Decapterus punctatus*) around a beam of Frying Pan Tower. Image credit: Explore.org/Richard Neal

A helicopter is often used to bring owners, volunteers, and guests to Frying Pan Tower. Image credit: Explore.org Tower Cam

Burge EJ, ES Harris. 2021. SharkCam Fishes. A Guide to Nekton at Frying Pan Tower. 6th edition. Los Angeles: Explore.org Ocean Frontiers. 230 pp. *Available online* http://explore.org/live-cams/player/shark-cam.

Guide version 6.0. 17 December 2021.