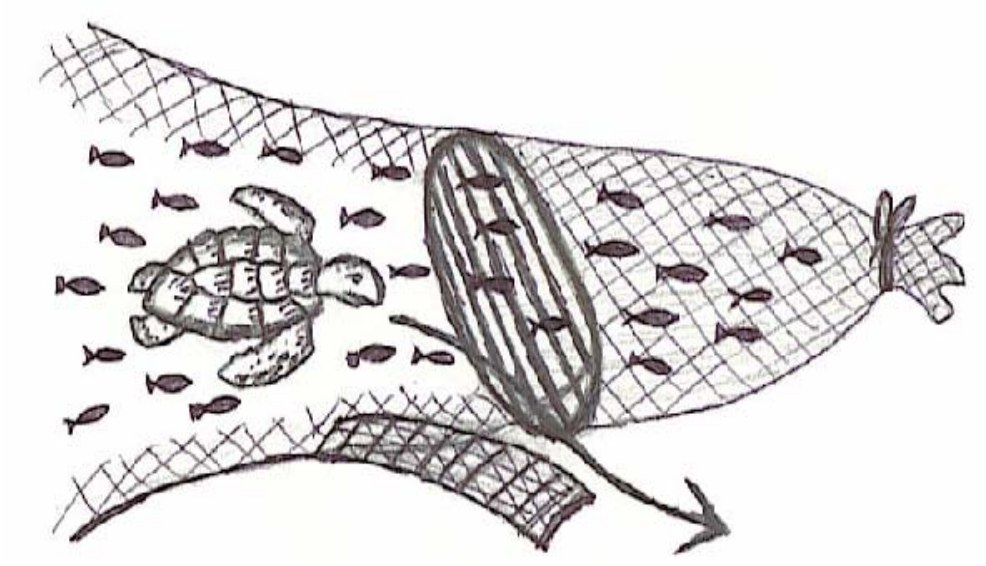
A “Catchy” Guide to Trawling

Trawling Identification Booklet

Created by Bonnie Batson (2009)



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Content

Trawling 101

Trawling is a fishing technique in which a large net is lowered into the water and dragged along the bottom of the sea floor. It is done commercially, (mainly for shrimp in Georgia) and for science research or education purposes. We trawl from the *R/V Sea Dawg*, our 43' education, research and collection vessel. The cone shaped trawl nets used on board are small compared to some commercial and factory trawl nets which can be 300 feet across at the mouth.

Courtesy of UGA MAREX

Our net, also called an otter trawl, has specific parts that enable it to work properly. Look at the illustration below. The **cod end** or "bag" is the closed end where most of the catch is gathered. The **throat** creates a funnel into the cod end from the larger open end, called the **mouth**. The **float line** keeps the top part of the net floating in the water column, the **lead line** keeps the bottom part of the net dragging along to stir up benthic (bottom dwelling) animals. The float and lead lines keep the net open vertically. The **doors** open the net horizontally acting as wings which pull apart as the boat maintains a slow but steady forward speed (2-3 knots).

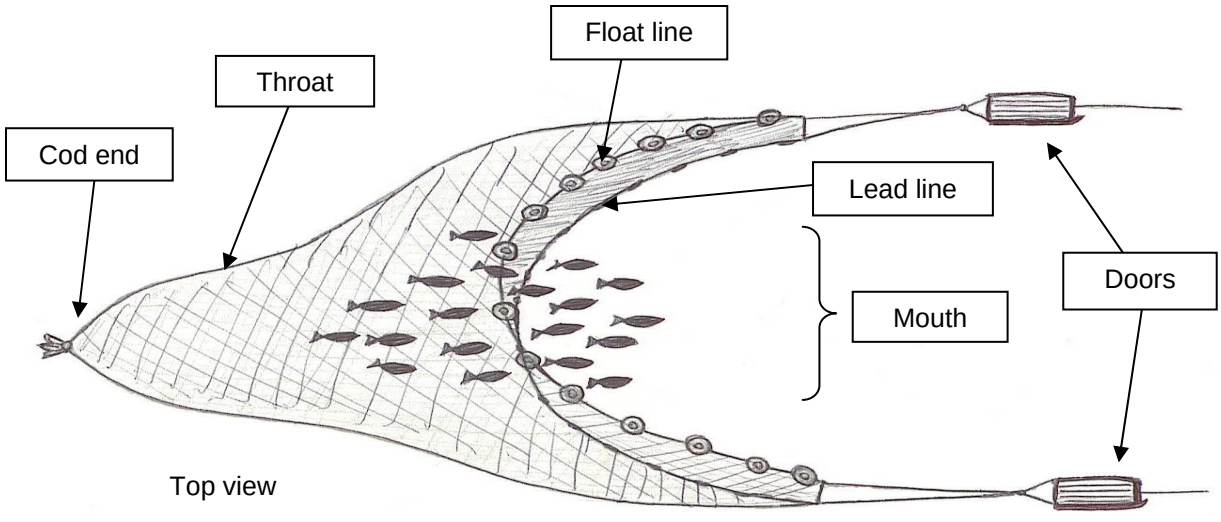


Illustration
Courtesy of Bonnie Batson

The net is only one part of the trawling process. The illustration below shows all of the gear involved. There is a **steel cable** attached to the **trawl net** that comes from a giant spool called a **winch**. The winch is powered by a hydraulic system controlled by the captain. The **A-frame** is also powered by hydraulics and can be tilted to hang the net directly over the water when lowering it. The A-frame holds the cable off the deck of the boat and provides extra leverage when pulling up the net. The cable separates into two cables called the **bridle** that attaches to the doors of the trawl net. The **swivel** prevents the two cables from twisting by letting them freely spin.

When lowering the trawl net into the water the cable is let out at a length of 5-7 times the depth of the trawling location. This is done in order to set the net on the bottom allowing it to skim over the bottom's surface. Once the net has been pulled on board the A-frame is moved to a vertical position to hang the net right above the collection table (see picture). The cod end is then untied, allowing the catch to fall out onto the table where it can be sorted. The table is filled with water to keep the specimens alive while observing them. There is also a temporary live well on board for larger specimens.

Courtesy of UGA MAREX

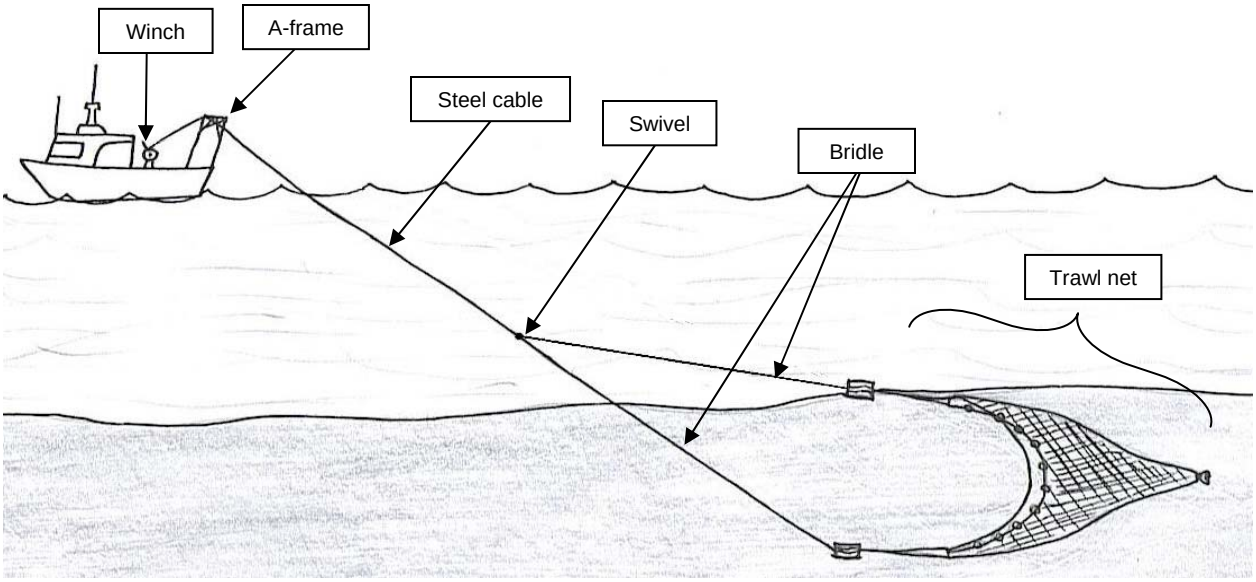


Illustration courtesy of Bonnie Batson

Who is TED?

In certain places, including Georgia, sea turtles can get caught in trawl nets and end up drowning. Sea turtles can normally hold their breath for a couple of hours but when trapped in a trawl net they panic and usually only last about 15-20 minutes. To prevent this from happening **TED**s (turtle excluder devices) were designed. TEDs let smaller fish and shrimp pass through the oval grid to the cod end while deflecting turtles through an **escape hole** (see illustration below). These are required by law for commercial trawling when the net is in the water for up to 4 hours.

The trawl net used on the *R/V Sea Dawg* does not have a TED. The sampling permit issued to the Marine Extension Service allows trawls of 15 minutes or fewer to prevent accidental drowning of sea turtles. Below is a rare picture of a kemp's ridley that was caught in our trawl net and quickly released in good health. There are five species of sea turtles that are found on the Georgia coast; kemp's ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricate*), leatherback (*Dermochelys coriacea*) and the most common loggerhead (*Caretta caretta*). Of these five, the kemp's ridley and loggerhead are most likely to be caught in an otter trawl net.

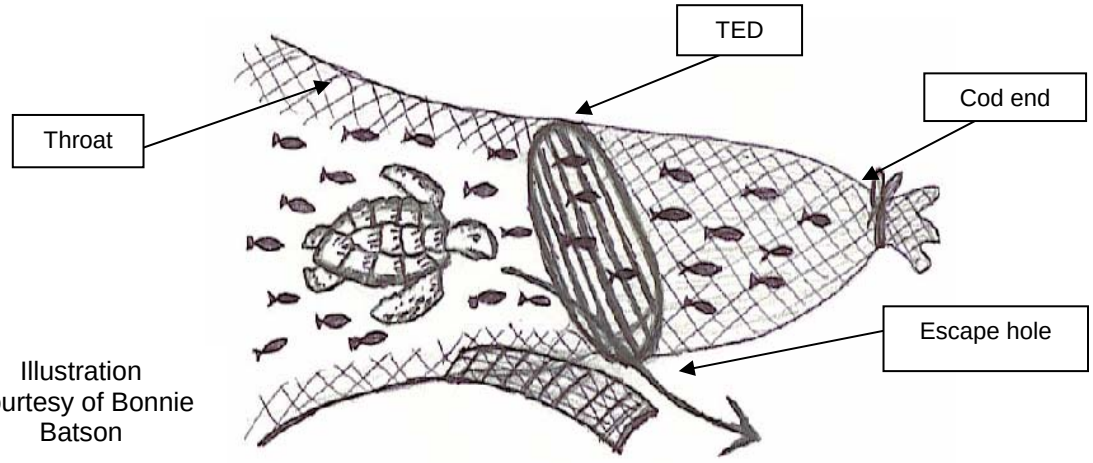


Illustration Courtesy of Bonnie Batson

Courtesy of UGA MAREX

UGA Marine Education Center & Aquarium
http://www.marex.uga.edu/aquarium

Trawl Net Trailers

There are a few animals that behave as if the trawl net is an “all-you-can-eat buffet”. These animals trail behind the trawl net in hopes of getting an easy meal. Some of the animals you might see are listed below:

Bottlenose dolphin:
Tursiops truncatus

Courtesy of Lindsay Bertch

Bottlenose dolphins usually hang around the net while it is under the water in order to eat fish caught in the webbing. They are often seen following the *Sea Dawg* riding in or “surfing” the boats wake.

Brown pelicans gather around as the net is being pulled out of the water. They dive down and fill their throat pouches with fish dropping off the net as it is pulled up. This is the most common pelican seen here. White pelicans (*Pelecanus erythrorhynchos)* are also native to the area but are rarely seen.

Brown pelican:
Pelecanus occidentalis

Courtesy of Fran Lapolla

Various species of gulls

Courtesy of Lindsay Bertch

Gulls fly over as the net is being pulled out of the water. They dive down to pick up any fish that have dropped off the net. During the summer the most common gull seen is the laughing gull (*Larus atricilla)* and during the winter the most common gull is the ring-billed gull (*Larus delawarensis*).

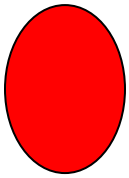
How to Use This Booklet

This guide will help you identify some of the common fish we catch when trawling in a Georgia estuary. The fish are categorized by different body shapes. Below is **1)** a list of what each shape stands for, **2)** a list of identification terms and definitions and **3)** a diagram of basic fish anatomy.

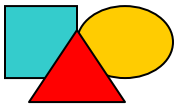
1)

This shape represents a cross section of a fish that is flattened from side to side, known as **compressiform** fish.

This shape represents a cross section of a fish that is flattened from top (dorsal) to bottom (ventral), known as **depressiform** fish.



This shape represents a cross section of a fish that is torpedo or football shaped, known as **fusiform** fish.

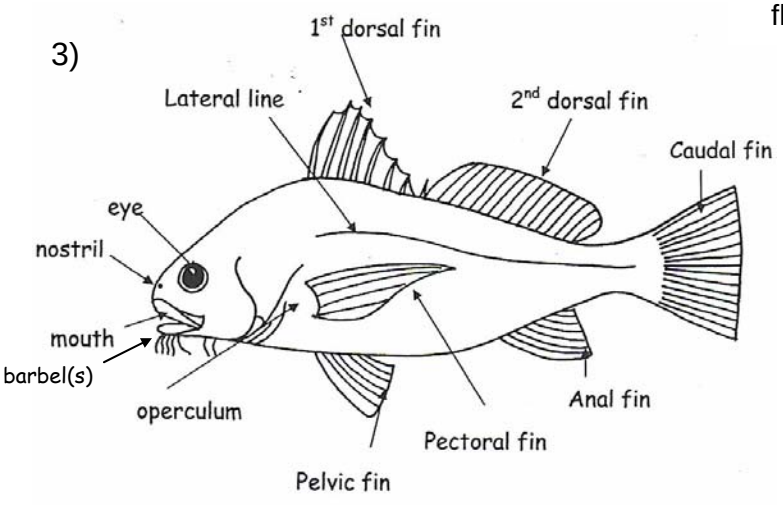


These shapes represent miscellaneous fish. Fish that have **other body shapes**.

2) **Identification terms:**

- **Dorsal**: The back or upper surface of fish
- **Ventral**: The stomach or bottom surface of fish
- **Barbel**: A fleshy sensory appendage, usually found around the mouth
- **Ocelli**: Spots that mimic (resemble) eyes
- **Operculum**: Gill covering found in bony fish
- **Detritus**: Dead/decomposing animal or plant matter
- **Bony fish**: Fish with hard calcium based skeletons
- **Cartilaginous fish:** Fish with soft flexible skeletons made of cartilage

3)



This is a diagram of a generic fish (remember not all fish look like this). Note the names of different fins on a fish, what each looks like and where each is located. The diagram also shows other features of fish external anatomy.

Find Your Fish

Use the following descriptions to correctly identify your fish. You will learn the common and scientific names of your fish as well as its basic life history. Have fun and remember to looks at body shape first!

Compressiform
Fish flattened from side to side

Atlantic bumper:
Chloroscombus chrysurus

Courtesy of Bonnie Batson

This bony fish has a much more curved ventral side than the dorsal side and a black “saddle” or spot near the tail. It feeds on small fish, cephalopods, zooplankton, and detritus. Juveniles are common in estuaries and are often associated with sea jellies.

This bony fish has very steep face and a short body. It feeds on small crabs, shrimps, fish and worms. Juveniles have very long filaments off the first dorsal fin and long pelvic fins for camouflage.

Lookdown: *Selene vomer*

Courtesy of Bonnie Batson and UGA MAREX

Atlantic moonfish: *Selene setapinnis*

Courtesy of Bonnie Batson

This bony fish has a steep face and a round, “silver dollar” body shape. It has no filaments on dorsal and anal fins as a juvenile. Moonfish feed on small fish and crustaceans. Reaching a maximum size of 1 ft, these fish are said to be good to eat though provide little meat.

This bony fish has dark vertical bands down its lighter colored body. The spadefish also has two dorsal fins (unlike the commonly mistaken for angel fish with only one). It feeds on crustaceans, mollusks, worms, sponges, cnidarians and plankton. Adults congregate in schools of up to 500 individuals.

Atlantic spadefish: *Chaetodipterus faber*

Courtesy of UGA MAREX

Atlantic menhaden: *Brevoortia tryannus*

Courtesy of UGA MAREX

This bony fish has a dark shoulder spot. It is a silver fish with brassy sides and a bluish green back. The menhaden is a filter-feeder. While swimming rapidly the fish opens its mouth and filters out plankton with its gill rakers. This fish is so oily that it is almost completely inedible to humans, but is used frequently in commercial animal feeds and as bait.

Depressiform
Fish flattened from top to bottom

Hogchoker: *Trinectes maculatus*

Courtesy of UGA MAREX

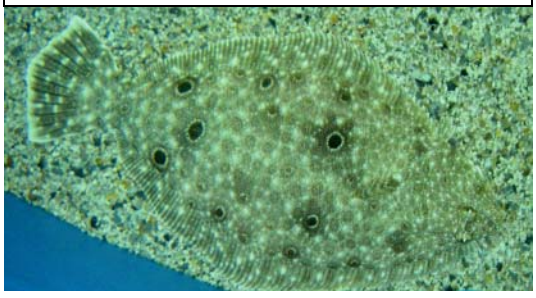
This bony fish has a small mouth and no pectoral fins. It has stripes dorsally and is colorless ventrally. This fish feeds on worms and crustaceans. Hogchokers are “right-handed” flatfish because their eyes and mouth are on the right side when viewed from the dorsal side.

This bony fish has no prominent ocelli. However, it usually has small spots and blotches of color on its upper surface and is colorless on the underside of its body. The southern flounder feeds mainly on small fish but does eat crabs and shrimps. This fish is a “left-handed” flatfish, with eyes on the left side when viewed from the dorsal side.

Southern flounder:
Paralichthys lethostigma

Courtesy of UGA MAREX

Summer flounder:
Paralichthys dentatus



Courtesy of Bonnie Batson

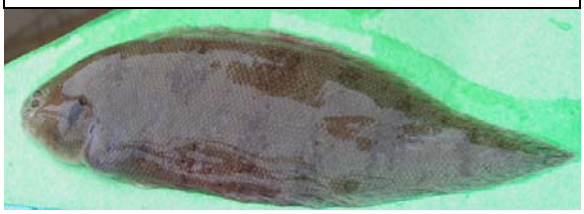
This bony fish has 5 large consistently placed ocelli with other spots and blotches of color distributed over the upper surface of the body. It is colorless on the underside of the body. The summer flounder feeds on squid, shrimps and small fish. This fish is a “left-handed” flatfish, with eyes on the left side when viewed from the dorsal side.

This bony fish has 4 large ocelli with whitish centers and is colorless on the underside of its body. It is commonly mistaken for the summer flounder. The ocellated flounder feeds on small fish, crustaceans and worms. It is a “left-handed” flatfish, with eyes on the left side when viewed from the dorsal side.

Ocellated flounder: *Ancylopsetta quadriocellata*

Courtesy of UGA MAREX

Blackcheek tonguefish: *Symphurus plagiusa*



Courtesy of UGA MAREX

This bony fish has a large blackish spot on its operculum and is colorless on the underside of its body. It has united caudal, dorsal and anal fins. The blackcheek tonguefish feeds on algae, mollusks, polychaetes, copepods and other small crustaceans. It is a “left-handed” flatfish, with eyes on the left side when viewed from the dorsal side.

This cartilaginous fish has a broad, diamond-shaped disk (body) and a short tail. It feeds on small bony fish, benthic copepods, crabs, shrimps, and clams. This ray is not a stingray so it does not have a venomous barb.

Smooth butterfly ray: *Gymnura micrura*

Courtesy of UGA MAREX

Atlantic stingray: *Dasyatis sabina*

Courtesy of UGA MAREX

This cartilaginous fish has very rounded outer body corners and a pointed snout. It feeds on tube anemones, polychaete worms, small crustaceans and clams. The tail barb is venomous.

Cownose ray: *Rhinoptera bonasus*

Courtesy of Bonnie Batson

This cartilaginous fish has pointed outer body corners and a squared snout that resembles a cow's nose. It feeds mainly on oysters and clams. The cownose ray migrates in schools of up to 10,000 individuals. It has a venomous tail barb.

Fusiform
Torpedo Shaped Fish

Black sea bass:
Centropristis striata

Courtesy of Bonnie Batson

This bony fish has rows of white stripes on its dorsal fin and white spots on each scale. Males are black or bluish in color. It feeds on crabs, lobster, shrimp and mollusks. All black sea bass are born females and then change into males at the age of 2-5 yrs.

This bony fish has a distinct spot at the base of the pectoral fin and a slightly pointed tail fin. It feeds on worms, crustaceans and fishes. Both male and female can make a croaking or drumming sound by contracting muscles against their swim bladder.

Atlantic croaker:
Micropogonias undulatus

Courtesy of UGA MAREX

Spotted hake: *Urophycis regia*

Courtesy of UGA MAREX

This bony fish has dark spots around its eyes and white spots along its midside. The spotted hake feeds primarily on fish, squid and crabs. It is the most common species of hake on the east coast.

This bony fish has many small dark spots positioned in wavy lines on its dorsal side. It has two large canine teeth and feeds on small fish and crustaceans. The weakfish can grow up to 3 feet in length and weigh as much as 17lbs. It is named for its fragile mouth which tears easily on a fishing hook.

Weakfish: *Cynoscion regalis*

Courtesy of UGA MAREX

Silver perch: *Bairdiella chrysoura*

Courtesy of Bonnie Batson

This bony fish has pale yellowish dorsal, caudal, anal and pelvic fins. It feeds mainly on crustaceans and worms. The silver perch has a long anal fin spine.

This bony fish has a distinct spot positioned behind the operculum and above the pectoral fin. It is rounder than the Atlantic croaker. Spot feed on small fish, worms, bivalves, crustaceans and detritus. Males can make drumming sounds by contracting muscles against their swim bladder.

Spot: *Leiostomus xanthurus*

Courtesy of Bonnie Batson

Southern kingfish:
Menticirrhus americanus

Courtesy of Bonnie Batson

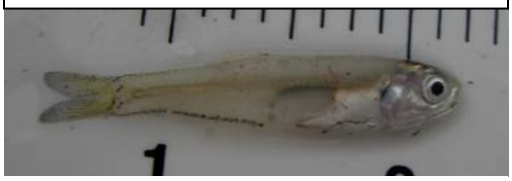
This bony fish has a single barbel on its chin and 7-8 diagonal bars on its sides. It feeds on worms, mollusk, and small crustaceans. The southern kingfish is also commonly called a whiting.

This bony fish has a large head flattened above the eyes and a short snout. It feeds mainly on small crustaceans. Males can make drumming sounds by contracting muscles against their swim bladder.

Star drum:
Stellifer lanceolatus

Courtesy of UGA MAREX

Bay anchovy:
Anchoa mitchilli



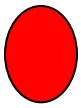
Courtesy of Bonnie Batson

This bony fish has a single dorsal fin, a silvery head, a lateral stripe and a very long lower jaw. It feeds mainly on zooplankton. Bay anchovies are a major food source for most of the piscivorous (fish eating) fish in the estuary.

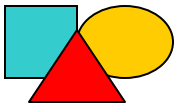
Atlantic sharpnose shark: *Rhizoprionodon terraenovae*

Courtesy of UGA MAREX

This cartilaginous fish has a long snout that tapers to the end. A mature shark has white spots down its side. It feeds on small bony fish, worms, shrimp, crabs, and mollusks. The sharpnose shark is viviparous (bears live young) and only reaches about 4 ft. in length



Fish with Other Body Shapes



Bonnethead shark: *Sphyrna tiburo*

Courtesy of UGA MAREX

This cartilaginous fish has a flattened spade or shovel-shaped head. It feeds on blue crabs, mantis shrimp, mollusks and small fish. The bonnethead shark is the smallest of the hammerhead-type sharks reaching only 3-4 ft. in length. This shark is viviparous (bears live young).

This bony fish has a large bony head, wing-like pectoral fins and 2-3 finger-like ventral rays on each side that are used for walking and feeling. It feeds on shrimp, crabs, bivalves and other fishes. Sea robins can produce loud drumming sounds by contracting muscles against their swim bladder.

Northern searobin: *Prionotus carolinus*

Courtesy of UGA MAREX

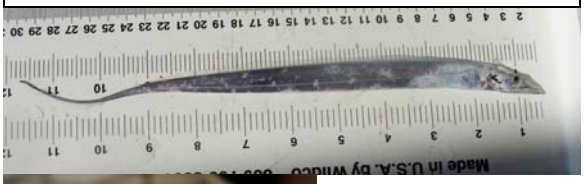
Striped burrfish: *Chilomycterus schoepfi*

Courtesy of Bonnie Batson and UGA MAREX

This bony fish is round in shape with dark stripes and dark patches behind the pectoral fins, and numerous sharp spines. It feeds on mollusk, barnacles and crabs with its powerful beak-like jaws. To defend itself the striped burrfish sucks in water (or air) to inflate its body.

This bony fish has a silvery ribbon-like body with no scales. It lacks a caudal fin; the body ends in a long filament. The cutlassfish has large fang-like teeth and feeds on small fish and shrimp. It is very good at steeling bait from unsuspecting anglers.

Atlantic cutlassfish: *Trichiurus lepturus*



Courtesy of UGA MAREX

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