Sea Stats

Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Research Institute

BAITFISH

Marine Middlemen

"Baitfish" is the common term given to a multitude of small, schooling fish whose main claim to fame is that they are an important food source for other fish. This large and diverse group of fishes is an integral part of the complex, interconnected marine food web. Baitfish are used in a variety of products such as fish meal, oil, pet food, and fertilizer and are, of course, used as bait. Regardless of the purpose of the catch, baitfish harvests support the state's lucrative and popular fishing industries, both recreational and commercial.

Description

Fifty species of baitfish exist worldwide, at least two dozen in Florida. Baitfish include such diverse representatives as the 4-inch anchovy and the yard-long ladyfish, a relative of the mighty tarpon. Because many of these species are similar in appearance, distinguishing one from another can be an exasperating exercise. This situation is further complicated by the fact that most species have been endowed with a variety of descriptive, but often regionally specific, nicknames. Menhaden, for instance, are known as "pogies" in the Gulf of Maine but south of Cape Cod may have common names such as "alewives," "fatbacks," "razorbellies," and "mossbunkers."

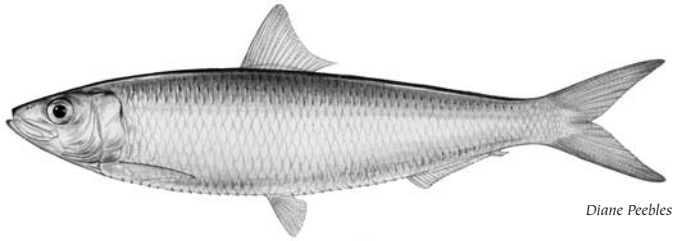
Fast FACT

Baitfish are the most abundant fishes in many of the state's estuaries; the most abundant baitfish is the anchovy, of which there are many species.

In this publication, the discussion focuses on the six most important commercial species of baitfish in Florida: Spanish sardines, Atlantic thread herring, Gulf menhaden, round scad, bigeye scad, and ballyhoo (along with its close relative, balao).

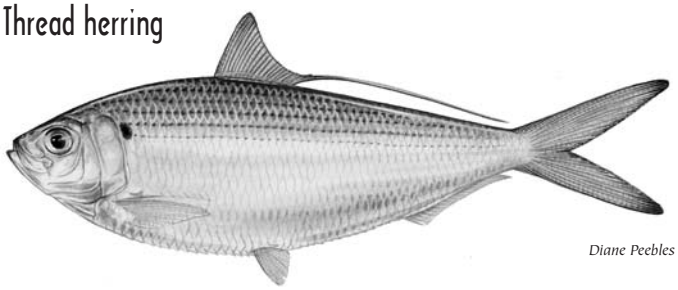
Spanish sardines

Spanish sardines (*Sardinella aurita*) are a type of herring. They have a long, torpedo-shaped silvery body with a dark blue back, a rounded belly, a deeply forked tail fin, and a single dorsal fin. Spanish sardines may reach 9 inches in length.



Diane Peebles

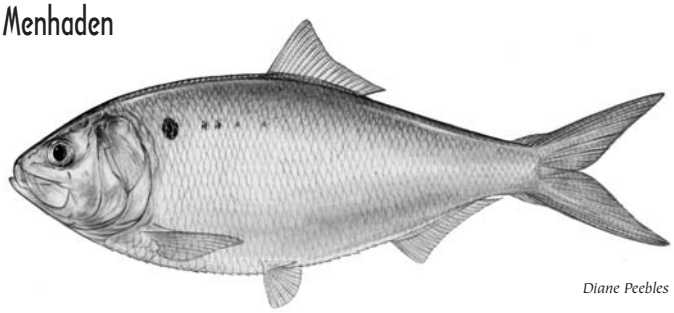
Thread herring



Diane Peebles

Atlantic thread herring (*Opisthonema oglinum*) are the most common Florida herring. They have a rotund body, a deeply curved belly, and a pointed head. Their common name refers to the long ray that trails from the back of their lone dorsal fin like a piece of thread. Silvery with a bluish or greenish back, thread herring have a dark spot above their gill covers and another dark spot behind, which is often followed by an entire row of dark spots. Six or seven streaks are present along their sides. They may grow to 8 inches and are also called "horse minnow," "hairy back," "grassy back," and "greenback."

Menhaden



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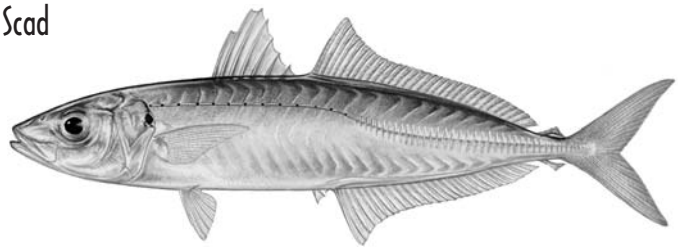
Gulf menhaden (*Brevoortia patronus*) grow to about 9 or 10 inches and are silvery with a dark blue-green back and yellow-green fins. A dark spot behind the gill cavity is about even with the eye. Some adults have additional spots on their sides. These fish have a pudgy, compressed body and have enlarged scales that extend from the mid-section to the dorsal fin. Their oily flesh makes them a popular choice for use in producing fish oil, meal, and fertilizer; they are also a popular bait for the Gulf Coast blue crab fishery. Menhaden are also called "fatback," "bugfish," "razorbelly," "alewife," "mossbunker," "pogy," and "shad."

Ballyhoo and balao

Diane Peebles

Ballyhoo (*Hemiramphus brasilensis*) and balao (*H. balao*) are members of a group of fishes known as halfbeaks, for their small, beaklike mouths. These fish are found throughout the state but are most abundant in south Florida, where they are often seen skipping along the surface of coastal or ocean waters. Ballyhoo and balao are landed together and sold as "ballyhoo." Both species are equally acceptable for use as bait. Anglers consider halfbeaks prime bait for sailfish, dolphin, and wahoo. Ballyhoo are silvery with a greenish back, and the upper lobe of their tail fin is yellowish-orange. Balao are silvery with a bluish back, and the upper lobe of their tail fin is bluish-violet and has a red tip. For both species, the single dorsal fin is set far back on the fish's back, near the deeply forked tail. The lower jaw elongates into a flat blade with an orange-red tip. Ballyhoo grow to 16 inches and are generally bigger than balao.

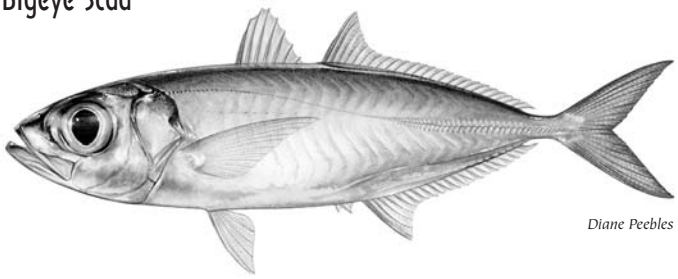
Scad



Diane Peebles

Round scad (*Decapterus punctatus*) derive their nickname "cigar minnows" from their long, cigarlike shape. Their narrow and stretched-out body is dark on top, shading to silver on the belly, and has black spots along the front half of the lateral line. These fish have a deeply forked tail fin and two separate, deeply notched dorsal fins. This species is one of the few baitfish species that have spines, which in round scad are particularly sharp, so these baitfish should be handled cautiously. Round scad grow to 9 inches and are also known as "cigarfish" and "hardtail."

Bigeye Scad



Diane Peebles

Bigeye scad (*Selar crumenophthalmus*) are also known as "goggle eyes" because of their large eyes, which are greater in diameter than the snout length. These fish have two widely separated fleshy tabs on the inside of the rear edge of the gill chamber, and scutes are present only on the rear part of the lateral line. Bigeye scad do not have detached dorsal or anal finlets and can grow to 2 feet, but they are usually less than 1 foot.

Although these six species are directly targeted by commercial fishermen, many other types of baitfish are taken incidentally as bycatch in baitfish nets or are harvested when the primary target species is scarce. Other minor fisheries include yellowfin menhaden, anchovies, scaled sardine, Gulf killifish, sheepshead minnow, Atlantic bumper, pinfish, and silversides. Fingerling mullet are also a component of the baitfish fishery in some areas.

Range and Habitat

Except for menhaden—which may move into the uppermost reaches of estuaries—the other of Florida's top six baitfish species typically reside in nearshore waters from the lower sections of estuaries to 90 miles offshore. Although baitfish can be found in waters 150 feet deep or more, commercial netters usually focus their efforts closer to shore, in waters 20 to 60 feet deep.

Spanish sardines and Atlantic thread herring are found throughout Florida waters, although their fisheries are located mostly in and off the Tampa Bay region. Although ballyhoo also occur statewide, the fishery for them is located primarily in south Florida from Miami to Key West. Round scad are caught mainly in northern Florida. Bigeye scad range from the northern Gulf of Mexico to southeastern Brazil and Bermuda, but are found worldwide in warm waters. As their name implies, Gulf menhaden are residents of the Gulf of Mexico and are found throughout west coast waters from the Panhandle to Florida Bay. Other menhaden species occur in the Gulf of Mexico and in the Atlantic Ocean, and occasionally they even crossbreed (hybridize) when they occur together.

Fast FACT

Thread herring migrating from North Carolina to Florida were estimated to travel at the rate of six to seven miles per day.

Life Cycle and Behavior

Spanish sardines and thread herring are plankton-eaters, equipped with special structures called gill rakers that enable them to filter suspended matter from the water. Most baitfish will, however, also eat small crabs, shrimp, and fish.

Baitfish migrate seasonally, moving north and south or into and away from shore. They do this in response to temperature changes or for spawning. They may also use habitats such as mangroves or seagrass beds for cover, and they appear to be attracted to structures such as piers.

Baitfish are fast-growing fish that rarely live longer than four years. Some, such as ballyhoo, balao, and scaled sardines, live only about one to two years. Fortunately, because their existence is so fleeting and precarious, baitfish usually mature at about one year of age and spawn frequently. Except for menhaden, which spawn in or near the mouths of estuaries, all of the commercially important species travel to oceanic waters to spawn. Most spawning takes place in waters from 30 to 165 feet deep, but eggs and larvae have been collected from even deeper waters.

Spawning seasons vary with the species. Gulf menhaden spawn in the fall and winter, but most baitfish spawn in the spring and summer. Each female can produce from 30,000 to 80,000 eggs and may spawn several times in a season.

The eggs of menhaden usually hatch into larvae within a few days of being fertilized. Menhaden larvae grow rapidly and are carried by currents to estuaries, where they will remain until they become full-fledged juveniles. When they mature, usually by the end of their first year, they begin moving offshore to join large schools and spawn. Baitfish die at extremely high rates from both natural and human-related causes, and the majority caught by anglers are only one or two years old.

As juveniles, baitfish join large schools and spend almost their entire lives in these tightly packed formations. The size of some of these schools can be awe-inspiring, and their ability to move as one unit, with the precision of synchronized swimmers, is remarkable. When frightened, baitfish in a school can dart off at a 90-degree angle in a flash, with each member turning as if on cue. Baitfish schools generally stay near the bottom during the day and rise to midwater or the surface at night to feed.

Fast FACT

Baitfish schools appear tighter and more compact during daytime hours and more dispersed at night.

Individuals seem to derive some protection from this safety-in-numbers tactic because schooling behavior often helps baitfish avoid being eaten by the multitudes of marine creatures larger than they are. A large school may confuse predators: viewed as a whole, the well-organized unit can appear to be one very intimidating creature! Scientists speculate that schooling behavior may sustain a population by increasing the probability of successful reproduction and by enhancing each

individual's survivability. On the other hand, an abundance of individuals concentrated in one place obviously makes the school easy prey for some predators. Schooling behavior certainly benefits fishermen; from their boats or with assistance from observers in spotter planes flying overhead, they can readily spy the vast, surface-skimming formations.

The importance of baitfish in sustaining the cycle of life in the world's oceans cannot be underestimated. Baitfish are the middlemen of the marine realm, recycling plant or animal matter into energy for their own needs and, in turn, providing nourishment for an astounding number of larger animals. The fate of most of the state's premier commercial and recreational fishes turns directly on the health of baitfish populations. Among the creatures that feed on various baitfish species are groupers, snappers, mackerels, sailfish, snook, spotted sea trout, tarpon, tuna, and wahoo.

Fast FACT

A study of the stomach contents of Spanish mackerel revealed that 76% of all fish examined had eaten nothing but baitfish, especially sardines.

Economic Importance

Baitfish are an important Florida commercial fishery. In the late 1980s, statewide landings of the top five baitfish species reached a whopping 37 million pounds in one year. Regulations designed to reduce fishing pressure on baitfish have now shaved that figure to about 10 million pounds a year.

Although baitfish are an important component of various useful products, their economic value is most closely linked to the growing interest in recreational fishing—anglers demand high-quality live or frozen bait. Indeed, harvests of Spanish sardines hovered at about one million pounds a year through the 1960s but jumped to six million pounds per year in the 1980s because of the heightened interest in sportfishing. "Ballyhoo" landings also increased in the late 1980s as fish processors began using vacuum packaging and flash-freezing techniques. In the late 1990s, menhaden made up the largest percentage of baitfish landings, followed by thread herring, Spanish sardines, and round scad.

Purse seine nets account for the majority of baitfish landings. Fishermen encircle baitfish schools with the nets and then close them, like the sides of a drawstring purse, to corral the quarry. Purse seines are so efficient, and the baitfish schools they target so large, that a single haul may net 200,000 or more baitfish.

In recent years, a variety of restrictions have been enacted regulating net sizes and the numbers and types of baitfish that can be caught. A 1994 constitutional amendment banning the use of certain nets in state waters has also affected baitfish harvests. These restrictions are designed to ensure the continued long-term health of these small but essential and valuable members of the marine ecosystem.

Research Efforts

Scientists at the Florida Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute are investigating the life history of baitfish and assessing the effects of fisheries management efforts. Among these efforts are annual surveys of baitfish populations in Florida; biologists employ acoustic devices that use sound waves to estimate the size of baitfish schools and overall population biomass along the west coast. In addition, biologists use typical fishing gears to determine the geographic distribution of baitfish stocks. Results of these studies are provided annually to the FWC, which regulates Florida's saltwater fisheries.

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