

Fish & Wildlife Conservation Commission

Florida Marine Research Institute

One of Florida's most spectacular game fish, the tarpon is a feisty foe whose powerful leaps from the water and bone-jarring bursts of speed test the skill and fortitude of even the most experienced angler. A hardy giant that can survive in a variety of habitats and salinities, the tarpon can even gulp air for extended periods when not enough oxygen is present in the water to sustain it. Despite its popularity among sport fishermen, many aspects of this extremely long-lived fish's life cycle and behavior remain a mystery.

# TARPON

Silver King of the Coast

Tarpon are silvery colored with blue-gray backs. Underwater, they appear to shimmer like huge gray ghosts as they swim sedately by. This appearance, along with their impressive size, is likely responsible for their nickname, "silver king." The huge mouth of the tarpon has a projecting, upturned lower jaw that contains an elongated bony plate. The tarpon's single short dorsal fin originates just behind the origin of the pelvic (or belly) fin. The last ray on the dorsal fin is very long and thin. Tarpon have a deeply forked tail fin and very large, platelike scales.

## Description

Tarpon share an ancient lineage with such seemingly disparate fish as bonefish, ladyfish, and eels. Indeed, tarpon-like fish have been discovered in fossils dating to the Cretaceous period, 100 million years ago. In prehistoric times, there were many more species of tarpon; today, there are just two: one that frequents the Atlantic and another found in the Indo-Pacific area.

## FAST FACT

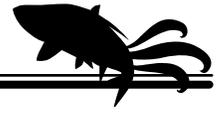
*One tarpon, captured in 1935, was still alive and on display in 1994, some 59 years later, at the Shedd Aquarium in Chicago.*

Until recently, tarpon were thought to have a life span of only about 15 years. However, using new, more accurate techniques to count annual-

<b>AT A GLANCE</b>	Scientific name	<i>Megalops atlanticus</i>
	Size	To 8 feet, approximately 280 pounds
	Range	In the western Atlantic, from Virginia to central Brazil and throughout the Caribbean Sea and Gulf of Mexico; in the eastern Atlantic, along the western coast of Africa
	Habitat	Most abundant in estuaries and coastal waters but also occurs in freshwater lakes and rivers, offshore marine waters, and occasionally on coral reefs
	Status	In Florida, recreational fishery only. Anglers must purchase a special permit to kill and keep a tarpon.

Tarpon art after Diane Peebles painting.





ly deposited rings in the earbones (otoliths) of fish, researchers found one individual that had lived 55 years. Most of the fish caught in the fishery are 15 to 30 years old.

The world's fishing record for a tarpon was set in 1991 when a 283-pounder was landed off the coast of Africa. The Florida record for tarpon caught with conventional tackle was a 243-pound fish captured off Key West in 1975.

## Range and Habitat

Tarpon have been reported as far north as Nova Scotia and have also been found off the coast of Ireland. However, they prefer tropical and subtropical waters and are most common from Virginia to central Brazil and throughout the Caribbean Sea and Gulf of Mexico. Because tarpon are sensitive to cold water, their range is generally limited to temperate climates. In Florida, they are found in water depths ranging from less than 3 feet to more than 80 feet.

Although scientists believe the western Atlantic stock is genetically uniform, they have observed regional differences in behavior and size. Tarpon in Costa Rica, for example, are generally smaller than Florida tarpon, and Costa Rica tarpon spawn throughout the year rather than seasonally as Florida tarpon do.

Tarpon thrive in a variety of habitats. They move offshore to marine waters to spawn, and the larvae gradually make their way to marshes and mangrove embayments in estuaries. Adults frequent a range of habitats, from nearshore coastal waters to stagnant pools, and can often be seen patrolling the coral reefs of the Florida Keys. In Costa Rica and Nicaragua, tarpon are frequently caught in freshwater lakes and rivers miles from the coast.

Although tarpon do migrate, little is known about the frequency or extent of their travels. Scientists do know that tarpon captured in Florida have later been recaptured as far west as Louisiana and as far north as South Carolina.

## Life History

In May and June, tarpon begin gathering together in areas near the coast in preparation for the journey to their offshore spawning grounds. In these staging areas, scientists and fishermen have observed schools of tarpon swimming in a circular, rotating motion. This behavior, known as a "daisy chain," may be a sort of prenuptial tarpon tango that prepares the fish for spawning. The actual exodus to the offshore spawning areas is probably triggered by lunar phases and tides.

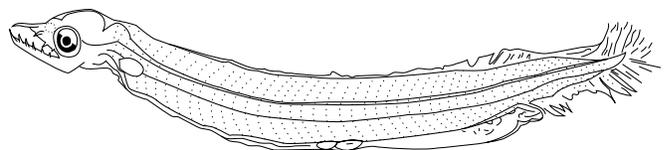
### *FAST FACT*

*During aerial surveys conducted by researchers with the Florida Marine Research Institute in 1989, 33 tarpon "daisy chains," each containing from 25 to 200 individual fish, were observed along a 12-mile stretch of Florida's west coast.*

During each spawning season, each female may produce from 4.5 to 20.7 million eggs. The heavier the fish, the more eggs she is likely to shed.

Scientists have never observed tarpon spawning or collected their fertilized eggs. Although no one knows exactly where tarpon spawn, tarpon larvae only a few days old have been collected as far as 125 miles offshore in the Gulf of Mexico. Spawning in Florida occurs mainly in May, June, and July.

The eggs hatch into larvae called leptocephali. These bizarre-looking creatures have a transparent, ribbonlike body with slender, fang-



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Larva illustration after B. Eldred, 1972; Fla. Dep. Nat. Resour. Mar. Res. Lab. Leaflet Ser. Vol. 4 Pt. 1 No. 22.



like teeth. The leptocephali drift with the currents toward the shore, reaching estuarine areas within about 30 days. Storms may assist in pushing the larvae toward their inshore nurseries.

By the time the larvae reach these inshore areas, they are about an inch long. At this point, they begin an amazing transformation in which they lose their teeth and begin shrinking in length, winding up as miniature versions of the behemoths they will eventually become. Scientists don't know how long this metamorphosis takes.

The juvenile tarpon make their way into marshes and mangrove swamps, where they will spend the remainder of the first year of their life. They are often found in stagnant pools. They grow rapidly and are about a foot long within one to two years. Females usually grow more quickly and are larger than males, and both reach sexual maturity at around 10 years of age. The sex of a tarpon cannot reliably be determined until their second or third year and then only by an internal examination.

Tarpon are often found in schools with other tarpon and are opportunistic eaters that feed on a variety of fish and crabs. They can tolerate various salinities, but they are vulnerable to cold snaps and become stressed when water temperatures fall below 55 degrees Fahrenheit. Although adults can often seek refuge from the cold in deep holes and channels, young fish are less able to escape cold waters.

***Fast Fact***

*Tarpon appear to resort to air-breathing more when water temperatures and hydrogen sulfide concentrations rise and dissolved oxygen levels plummet.*

One particularly remarkable facet of tarpon physiology is the fish's ability to breathe both underwater and out of the water. When dissolved oxygen levels in the water are adequate,

tarpon breathe like most fish, through their gills. When oxygen levels are depleted, however, they can also breathe by gulping air, which is then passed along to their highly specialized swim bladder. The swim bladder functions as an accessory lung and even resembles that organ, with its spongy, highly vascular tissue. The swim bladder can also be filled with air as needed to help the fish maintain its desired depth in the water. Scientists believe the tarpon's ability to breathe air is a nifty adaptation that allows it to survive in the stagnant, oxygen-poor pools and ditches it frequents.

**Fishery History and Management**

Tarpon have long been a target for Florida fishermen. While they are not considered good to eat, their size and fighting prowess have made them one of the state's most coveted sportfish. As long ago as the beginning of the 20th century, fishermen in canoes hunted tarpon with a variety of equipment, from harpoons to hand lines.

In 1953, Florida officials established a fishing limit of two tarpon per day and prohibited their sale. In 1989, the Florida legislature established a permit system in which the Florida Fish & Wildlife Conservation Commission (FWC) determines the number of permits that can be sold; a permit is required if the fisherman wishes to kill and keep the fish. In 1996, the permit cost \$50 for a year. By 1997, landings of tarpon had declined to less than 100 a year, so the fishery is now largely a catch-and-release endeavor in which a permit is not required.\*

Statistics on the number of tarpon caught by sport fishermen are not precise, but one survey indicates that 50,000 to 88,000 tarpon were hooked by anglers from 1992 to 1995. Scientists believe the tarpon population in Florida is stable;

\*Fishing regulations may change annually. Contact the FWC Division of Law Enforcement for information about current regulations.



however, they stress that a downward trend in the recruitment of juveniles into the fishery would be difficult to detect because this fish lives so long. A decrease in adult populations would signal a decline in the recruitment of juveniles into the fishery, but it would be many years before a decrease in the adult populations of this long-lived fish could be seen.

Tarpon tournaments are popular in Florida, with at least a dozen held in the state each year. One tournament in the Tampa Bay area has been conducted since before World War II. Perhaps the most famous tournament is the Gold Cup, a fly fishing competition held in the Florida Keys. Among its winners was baseball legend Ted Williams.

The premier tarpon fishing “hot spots” in Florida are Boca Grande Pass, which is in southwest Florida, and the Florida Keys. In general, more tarpon are caught on the state’s west coast than the east. Tarpon are most abundant in the months of May through July, but records show that they are caught in all months.

Although tarpon appear to be sensitive to noise and boat traffic and may become skittish and reluctant to take bait when the waters are crowded with boaters, tarpon are unlike many other fish in that they can frequently be found in highly urbanized areas with poor water quality. They will take a variety of live and dead bait, as well as artificial lures and flies. Many fishing guides specialize in tarpon fishing, and it is

thought to be one of the most economically valuable recreational fisheries in Florida.

## Research Efforts

Scientists at the Fish & Wildlife Conservation Commission’s Florida Marine Research Institute (FMRI) have been at the forefront of pioneering research into the life cycle and behavior of tarpon. Among their accomplishments are aging studies that have shown that tarpon live as long as 55 years. In these studies on otoliths, the rings (deposited annually much like those on a tree) are counted. Scientists remove the otoliths from the fish, cut a cross-section through them with a special diamond-bladed saw, and examine the rings under a microscope to estimate the ages of a variety of tarpon. FMRI researchers also are participating in a study to refine tarpon-aging techniques by using natural radio isotopes found within the otoliths. By measuring the rate at which these radio isotopes decay, scientists can estimate the age of the fish, much as paleontologists use carbon dating to age dinosaur fossils.

Scientists are also trying to pin down how long the larval phase lasts in tarpon, how larval fish reach the estuaries, and what factors determine how many recruit into these inshore nurseries.

Despite its fame and familiarity with anglers, many questions about the lifestyle and behavior of the state’s “silver kings” remain unanswered.



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