Sea Stats

Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Research Institute

RED DRUM

Marine Musicians

One of Florida's most popular sport fish, red drum is also one of the state's most widespread estuarine inhabitants. Red drum are prodigious spawners that may produce tens of millions of eggs each year. Their relative hardiness and prolific nature make them ideal candidates for rearing in hatcheries. Stringent fishing restrictions have been instrumental in restoring populations of this popular sport fish, which frequents practically all of the state's estuaries.

Description

Also called redfish, channel bass, spottail, and red bass, red drum are marine fish that are easily identified by the eyespot on the tail. Their common name aptly describes both their reddish hue and the "drumming" sound they make during spawning or when taken from the water. This drumming is produced by special muscles rubbing against the inflated air bladder, like fingers rubbing on a balloon.

Red drum are reddish-brown on the back, fading to white below. Juveniles have a copper or bronze tint. While most red drum have one distinctive black spot at the base of the tail, some have several spots; in 1997, a fish with hundreds of spots was identified as a red drum by fish biologists. The body is elongated and thick, with a gently arched back and sloping head. The large scales on the upper body are rough, while those on the breast area are smooth. Red drum have two dorsal fins; the front fin has sharp spines, and the back dorsal fin has soft rays resembling a flat-top haircut. The tail of an adult is broad and either flat at the end or slightly concave. The long pectoral, or side, fins are the color of rust.

The colors of the red drum vary according to where the fish lives. Red drum in the Gulf of Mexico are a lighter red than those that reside in muddy bays. Occupants of white, sandy bottoms have light, muted tones. When a fish is taken from the water, it may turn a darker red.

Red drum in Florida may live 25 to 35 years. Reds on the Atlantic coast are generally larger than those on the gulf coast. Although the largest red drum ever caught weighed 92 pounds, the Florida record is 52 pounds, 5 ounces, for a fish taken in Cocoa in 1996. The largest red caught in Florida with fly fishing tackle was landed in 1995 in the Banana River and weighed 43 pounds.

At a glance

Scientific Name	*Sciaenops ocellatus*
Size	On average can grow to 40 inches, 40 pounds on the Gulf of Mexico coast; 45 inches, 52 pounds on the Atlantic coast
Range	From Massachusetts to Key West along the Atlantic coast and throughout the Gulf of Mexico
Habitat	Juveniles occur in seagrass meadows and over muddy and sand bottoms in inshore estuaries; adults normally occur in open oceanic and gulf waters
Status	Only recreational harvest of red drum is permitted, with size and bag limits

Red drum art after Diane Rome Peebles painting.

Range

Red drum occur in the Atlantic Ocean from Massachusetts to Key West and throughout the Gulf of Mexico. They are rare in south Florida, along the Atlantic coast north of the Chesapeake Bay, and along the Mexican coast south of Vera Cruz. Most of their life cycle is spent in nearshore waters, so management of the red drum fishery is primarily a state responsibility rather than a federal one.

Red drum thrive in a wide range of salinities, an adaptation that serves their versatile lifestyle well. The ability to tolerate low-salinity water depends on the size of the fish; juveniles are able to tolerate freshwater conditions, whereas larger fish prefer higher salinities. Red drum are also comfortable in a wide range of water temperatures, from 50°F to about 81.5°F. Small red drum can withstand a greater range, from about 36°F to 91°F. They are vulnerable to sudden drops in temperatures, however, and move into warmer, deeper waters during cold spells.

Life History

Given their relatively long life span, red drum mature at a young age. Males can spawn when they reach about two years of age and four pounds in weight, whereas females are sexually mature at about four years old and 13 pounds. They begin spawning in the fall, when waters start to cool and daylight hours decrease. Most red drum spawn near passes and inlets. However, reds in the Everglades area may travel farther offshore; those in Brevard County's Mosquito and northern Indian River lagoons stay within the estuary to spawn. Spawning season in the Gulf of Mexico runs from August to mid-November, peaking in September. Atlantic stocks of red drum may begin spawning as early as July and continue through December, peaking in September or October. Spawning is often triggered by new- or full-moon phases.

Red drum have a very energetic and elaborate courtship ritual. Beginning in the late afternoon, males follow females for hours at a time, drumming loudly and butting them. Often, several males pursue a single female. The colors on the males dramatically intensify during courtship; their bellies turn stark white and their flanks and backs turn bronze. Just after dark, the animals shudder, and the female releases a milky cloud of eggs and the male a cloud of sperm into the water. Females may shed 1 million eggs in a single spawn—enough to fill a quart jar—and they may spawn every three to five days. Over an entire spawning season, these prolific fish may produce tens of millions of eggs, although very few will survive to adulthood.

Fast FACT

Generally, red drum do not spawn until days contain 10.5 hours or less of daylight.

The fertilized eggs, about 1 millimeter in diameter, are clear and contain tiny oil globules that keep the eggs afloat as they are carried shoreward by tidal currents. Within 20 to 30 hours, tiny larval fish hatch from the eggs. Each fish has an attached yolk sac, which provides nutrients during the first three days of life. After the yolk sac is completely absorbed, the larval red drum feed on mostly microscopic floating animals called plankton, which sustain the tiny larvae on their journey into the estuarine nursery areas. An early, severe winter following spawning can make the larvae sluggish and unable to capture plankton for food. The fragile larvae are also susceptible to changes in salinity and grow best in salinities of about 30‰. After this stage, which lasts about 2½ weeks, gradual salinity variations are not a serious problem.

Inside the estuary, the juveniles settle along the edges of thickly vegetated seagrass beds and other vegetation because these small fish need protection until their fins develop enough for them to swim and their mouth parts develop enough for them to feed on the bottom. When they are about one inch long, the young fish begin to gather in schools. They grow rapidly in their first year, as much as one inch or more a month. By the end of their first year, they may be 13 to 14 inches long. Red drum continue to grow throughout their lives, although once they reach about three feet long, they gain more in girth than in length as they age.

Young-of-the-year juveniles (fish less than one year old) move in and out of backwater channels and canals as they develop. Juvenile red drum may

remain in the estuary for up to four years. As adults, red drum move out of the estuaries and join large aggregations of sexually mature fish. While some inshore spawning occurs, most red drum spawn in nearshore waters at the entrance to an estuary.

In general, Florida red drum are not long-distance travelers and tend to remain in the same geographic area in which they were spawned. In tagging studies of immature red drum on Florida's gulf coast, 50% to 85% were recaptured within six miles of their original release site.

Although they sometimes feed at the surface or in midwater, red drum are primarily bottom feeders. Indeed, in shallow water, they can often be seen browsing head-down with their tails out of the water—a behavior called "tailing." Their fondness for tasty crabs and shrimp probably contributes to their own delicate flavor and tender white meat. Red drum locate food by both eyesight and touch, through vacuuming or biting the bottom.

As red drum grow, their food preferences change. Small juveniles select copepods and other tiny crustaceans, whereas larger juveniles target crabs and fish. During their first two years, they favor a diet of crabs; after that, fish also become a favored food item. Red drum feed primarily in the early morning and late afternoon and are voracious eaters whose penchant for lunging at almost any natural bait endears them to fishermen.

Mangroves and marsh grasses indirectly play a critical role in the diet of red drum in southwest and south Florida. Fish, crabs, and shrimp feed on mangrove leaves that fall into the water and decay, and red drum feast on the fish, crabs, and shrimp. This cycle is part of an intricate, life-sustaining food web that reverberates throughout estuarine systems. Because estuaries are vital nursery grounds for red drum, deterioration of water quality or loss of suitable habitat in these areas may limit the number of young fish that become reproductive adults.

Economic Importance

As early as the 1700s, individuals caught red drum for food and recreation off the Atlantic Seaboard from Virginia to Georgia. In Florida, red drum were caught mainly for sustenance until the growth of transportation networks and markets allowed fish to be shipped long distances. A commercial fishery for red drum began in the 1850s. Since the early 1980s, however, the majority of red drum caught in Florida have been taken by recreational anglers. For example, the recreational harvest in 1985 totaled 2.3 million pounds, while the commercial harvest accounted for less than half a million pounds.

In the 1970s, red drum populations in Florida began to decline. In fact, red drum apparently disappeared from Biscayne Bay—possibly because of declining water quality, loss of habitat, and diversion of freshwater flows. The surging popularity of spicy, blackened redfish on restaurant menus in the early 1980s resulted in similar declines throughout the U.S. Gulf of Mexico coast.

Management Efforts*

Beginning in 1986, the state and federal governments began enacting regulations to protect red drum, culminating in reduced recreational catches and a complete ban on commercial harvests in Florida in 1988. After the regulations were enacted, annual landings of red drum were reduced from 2.1 million fish in the mid-1980s to about 250,000 in 1993. Recreational harvests are still allowed year-round, but there are bag and size limits. Since 1993, recreational harvests have increased because more sport fishermen have targeted this rapidly growing, easily accessible nearshore species, but the growing emphasis on catch-and-release fishing may lower recreational landings in future years.

Since 1988, scientists with the Florida Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute have reared red drum in the state fish hatchery at Port Manatee in order to assess the feasibility of releasing these fish into the wild as a management tool. Using 20- to 30-pound red drum caught in the wild as brood stock, the scientists manipulate water temperature and the periods of light and dark in order to fool the fish's

*Fishing regulations may change annually. Contact the FWC Division of Law Enforcement for information about current regulations. You can also view the current saltwater fishing regulations at the Web site for the FWC, Division of Marine Fisheries Management, located at http://MyFWC.com/marine.

biological clock so that the fish will spawn on demand. The eggs are carefully tended until they hatch about 24 hours after spawning. The resulting larvae are raised to juveniles of various sizes and are then released into the wild, where their survival is evaluated; scientists hope that this research will produce a viable method of rebuilding native stocks. From 1988 through December 2004, more than 6 million juvenile red drum were released into Tampa Bay, Sarasota Bay, Biscayne Bay, Indian River, and estuarine areas of Collier and Volusia counties.

fast FACT

Because the east and west coast populations of Florida red drum are genetically different, researchers do not mix hatchery-reared juveniles from east coast stock into west coast populations or vice versa.

Three sizes of hatchery-raised red drum have been released: juveniles from 1 to 1.5 inches long, juveniles 3 to 4 inches long, and juveniles 6 inches or longer. The smallest group is only about thirty days old, and the largest juveniles are about 6 months old. By studying how well these various age groups do on their own, researchers expect to determine which size will be both economical to produce and reasonably able to survive in the wild.

Information from anglers is important in tracking the success of the hatchery program. In Biscayne Bay, scientists were successful in establishing a small population of hatchery-reared red drum to replace a wild one that was either very small to start with or had virtually disappeared decades ago. Many of the hatchery-reared red drum are equipped with special tags; information printed on the tag asks the angler who hooks the fish to provide FWC scientists with data about the catch. Through this program, researchers have determined that about 17% of the hatchery-raised fish released in the Indian River were caught and reported by anglers, whereas 0.42% of the larger red drum released in Biscayne Bay have been captured and reported by fishermen.

A fisheries-independent monitoring program supplements this effort by sampling for hatchery-reared juveniles too small to be caught by fishermen. This program also provides important information about which habitat types are more likely to be vital to the survival of these young fish.

Fishing license revenue and the federal Sport Fish Restoration Program are important sources of funding for sport fish research. The Sport Fish Restoration Program is a "user pays/user benefits" system funded by a tax on sales of recreational fishing equipment and boat fuel. The program supplies three dollars for every one dollar provided by the state for projects that improve fishing and boating opportunities.

Project Tampa Bay

A major project is underway in Tampa Bay to determine the most cost-effective size of hatchery-raised red drum to release, and when and where to release them to optimize survival. Project Tampa Bay released its first fish in March 2000. As of December 2004, more than 4 million red drum have been released, some with miniature radio transmitters surgically implanted. These fish are being tracked using a variety of methods, including DNA analysis of fin clips received from anglers and underwater acoustic tracking following the "pings" coming from the radio transmitters. The results from Project Tampa Bay will tell researchers which methods of marine stock enhancement are the most cost-effective and successful.

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