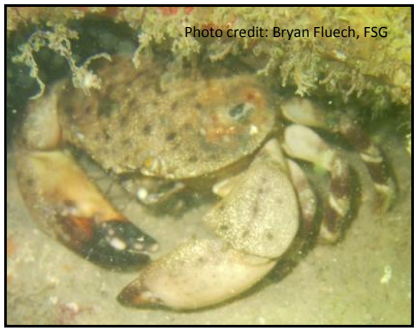
Florida Stone Crab Ecology

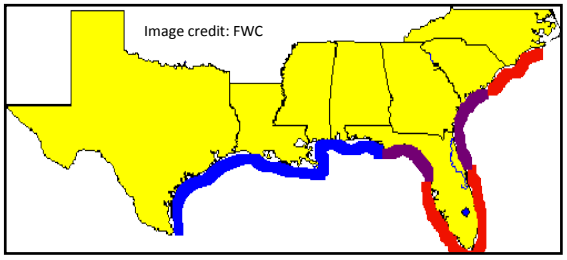
Although two species of stone crabs occur in the Gulf of Mexico, the species found in Southwest Florida is the Florida Stone Crab *(Menippe mercenaria).* The other species, the Gulf Stone Crab *(Mennippe adina),* is predominantly found in the Northern Gulf of Mexico.

General Description:



Adult Florida stone crabs are typically tan to light or medium gray with small uniform black spots on their body. They have a smooth oval carapace and the legs are dark brown with distinct white bands. They have large powerful claws with black tips; a large crusher claw and a smaller pincher claw with numerous small teeth used for cutting. Juveniles tend to be darker than the adults. They are deep purple to black and have white flecks on their carapace. They can be confused with other "mud" crabs, but like the adults, have distinctive the white bands on their legs.

Geographic Distribution



Florida stone crabs are found from the west central part of Florida south to the Florida Keys and around the peninsula to east central Florida as well as parts of South and North Carolina. In between this area on the east coast along with parts of the Panhandle a hybrid zone occurs where both species of stone crab occur and interbreed.

Distribution map of the 2 stone crab species found in the Gulf of Mexico: Blue = Gulf stone crab range, purple= Hybrid zones, and Red = Florida stone crab range

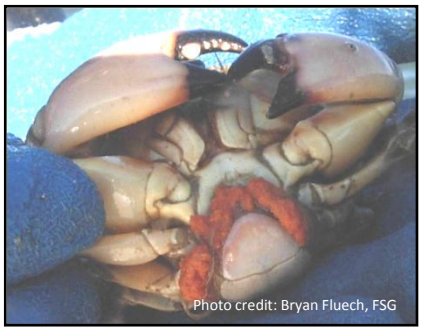
Diet

Stone crabs are generally opportunistic carnivores, but will occasionally feed on plant material. Larvae feed on smaller zooplankton while juvenile and adult stone will feed on oysters, clams, barnacles, anemones, worms, and other crabs. Their powerful claws are well adapted to crushing, tearing, and ripping their prey. If a crab loses one or two of its claws, it will make feeding more difficult and may change its feeding behavior and resort to scavenging.

Habitat Preferences

Like many coastal species, juvenile and adult Florida stone crabs utilize a variety of estuarine and nearshore habitats throughout their life cycle. Larvae are planktonic and are found in nearshore coastal waters and within estuaries. Juveniles inhabit hiding places such as crevices in and beneath rock, shell, sponges, and tunicates. Adult Florida stone crabs live in burrows and can be found in seagrass beds or on rocky substrates near and offshore out to depths of 200 feet.

Reproduction



Stone crabs can only mate after the female has molted and her shell is soft. Female molting and mating mostly occur September through November. Females can store sperm received from the male in special sacs for up to a year. Eggs are fertilized internally, but are eventually deposited beneath the female's abdomen or "apron" in an external mass called a sponge. As many as 1 million eggs can be stored per sponge and females can produce several sponges in a single spawning season. Eggs usually hatch within two weeks and larval development takes approximately four weeks before metamorphosis to the juvenile stage.

Spawning Season

Spawning can occur year round, but Florida stone crabs typically spawn from April through September. Most female Florida stone crabs can begin spawning when they reach approximately two years of age. Although scientists do not know for sure where spawning sites occur, it is thought that oyster reefs and seagrass beds play an important role.

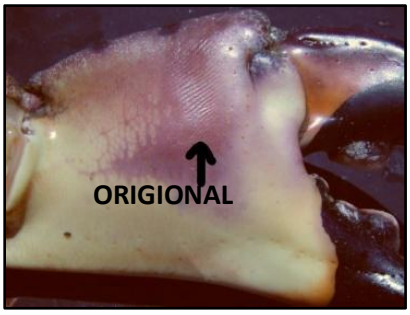
Growth and Life Span

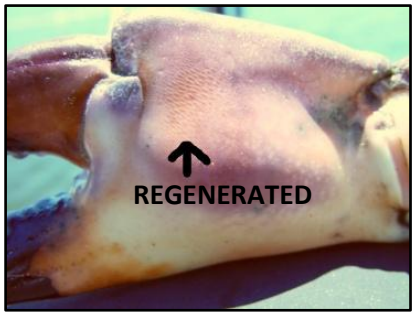
Adult stone crabs can reach up to six inches in carapace width. Male stone crabs typically grow larger than females and their growth rate is more variable. Although there is no precise method for determining the age of stone crabs, researchers believe males can live for seven to eight years and females up to eight or nine years.

Regeneration of Claws

As with other crustaceans, stone crabs have the ability to regenerate their appendages if removed or damaged. It is important to note, however, that a stone crab can re-grow either of its claws only if the joint that linked the claw to the body is left intact. Since it is only the claws that are harvested in the fishery, it is extremely important that fishermen properly remove them to ensure they can regenerate. Fishery observers estimate approximately 19% of the claws harvested by the fishery are regenerated.

According to researchers from the Florida Wildlife Research Institute, "Regeneration in adult crabs takes one year due to the seasonal molting of adult females in fall and adult males in winter. The regenerated claws start out smaller than the original and will continue to grow through subsequent molts. After three molts (three years in adult crabs) a claw can regain 95 percent of its original size. In juvenile stone crabs regeneration of lost appendages can be more rapid than adults. Juvenile crabs molt two or more times per year giving juveniles the ability to regenerate an appendage in a few months."





It is fairly easy to tell if a claw has been regenerated by looking at the inside portion of the claw or propodus. If the inside has unbroken lines on it that looks like a fingerprint, the claw is original. If the inside of the claw looks like a series of dots and/or dashes the claw has been regenerated.
(Photo credits: FWC)

Survival Rates of Crabs Missing Claws

The survival rate of crabs that lose one or two of their claws depend on several factors including 1) the nature of the wound-crabs have a better chance of surviving if the diaphragm at the body/claw joint remains intact, 2) whether one claw or two claws are removed-the only research study that addressed the issue found 47 percent of the crabs declawed by double amputation died from the trauma while 28 percent of crabs with a single amputation died, and 3) the sex and size of the crab-many larger male and female crabs never fully regenerate their claws due to their relative old age. Also the largest males typically have the highest fishery-related mortality because of the effectiveness of the traps to capture them and because a large percentage of the male's body weight is contained in its claws.

The diaphragm functions as a seal to close the wound and stop the bleeding. Photo credit: FWC

Commercial and Ecological Importance

Stone crabs are one of the most economically valuable commercial fisheries in Florida. In 2009 over 2.6 million pounds of stone crab claws were landed in the state with an estimated value of over $17 million. The fishery is managed by a seven month open season (Oct 15th-May 15th), minimum claw size requirement (2 ¾ inches), trap specifications, and a passive trap limitation program. They are a popular table fare for many Floridians and are sold throughout the nation. They also serve an important ecological role in that their burrows provide habitat for a wide variety of marine life that use the burrows for protection, food, and survival, and they area a food source for other types of marine life.

References:

- Florida Wildlife Research Institute**:** **http://research.myfwc.com/features/category_sub.asp?id=5743**
- NOAA Fish Watch. U.S. Seafood Facts**:** **http://www.nmfs.noaa.gov/fishwatch/**

For More Information Contact:
Bryan Fluech
Collier County Sea Grant Extension Agent
(239) 417-6310 x204
fluech@ufl.edu
http://collierseagrant.blogspot.com

Solutions for your Life