

# The Blue Crab: “Beautiful Swimmer”



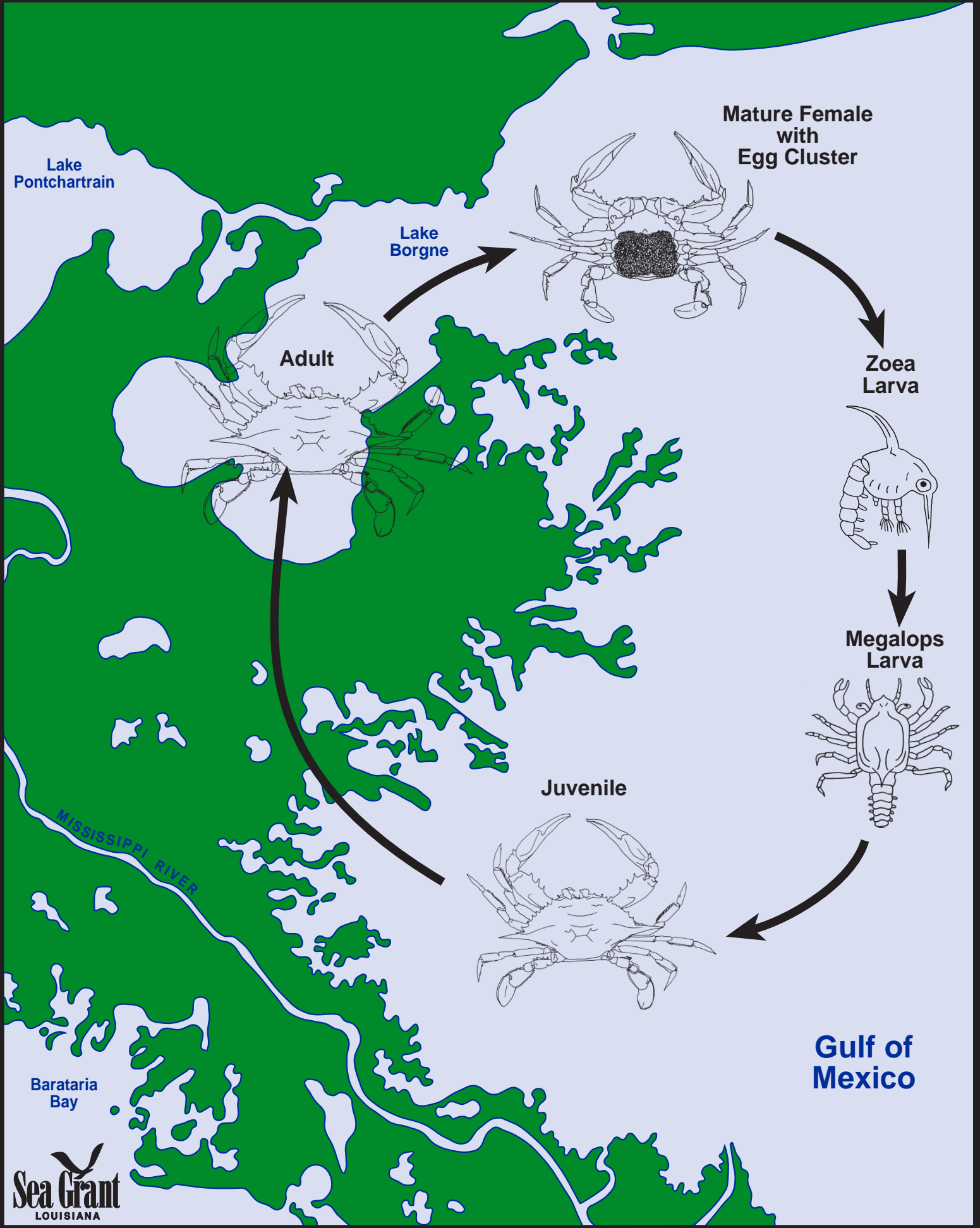
Produced by the Louisiana Sea Grant College Program,  
Louisiana State University, Baton Rouge, LA 70803

**December 1999**

Life cycle illustration  
by Robert Ray

Text  
by Elizabeth Coleman

Format  
by Bonnie Ducote



**THE LIFE CYCLE OF A CRAB**

The blue crab, *Callinectes sapidus*, is a swimming crab and is abundant along the North American coasts of the Atlantic Ocean and Gulf of Mexico. It is the crab found most commonly in Louisiana waters; the lesser blue crab (*Callinectes similis*) is a smaller crab that is also found here but in fewer numbers. *Callinectes sapidus* means “beautiful swimmer that is savory,” an apt description of this tasty, blue-shelled crustacean. The mild, delicate flavor of its meat makes the blue crab prized, and commercial crabbing is an important seafood industry in Louisiana. Crabs are harvested in hard-shelled and soft-shelled phases and both are popular with consumers. Hard-shelled crabs are boiled and the shells removed so that only the meat is eaten, but soft-shelled crabs can be consumed with most of the shell intact.

## How Crabs Grow

Crabs have an outer hard shell called an exoskeleton. Unlike skin, the hard shell can't stretch to accommodate growth, so the crab must molt, or shed its shell, in order to grow. To break free of the restricting outer shell, the crab swells with water and casts it off. The soft, pliable shell that has formed underneath absorbs water and stretches, allowing the crab to increase in size by about 25 percent. It is at this soft stage that the crab shell can be eaten. In about 12 hours, the new shell hardens into what is called a “papershell,” which is firmer than the soft shell but not completely hard, and the crab then begins to feed and add weight inside it. A crab's shell hardens faster in warm water than in cool, but generally the hardening process is complete within two or three days. As the crab grows, the shedding process occurs again and again, as often as 25 times.

Small crabs may molt every few days, but as they become larger the period between molts becomes longer. Male crabs continue to molt and grow throughout their lifespan, generally thought to be three or four years, but females stop growing when they reach sexual maturity, after about 20 molts.

## Life Cycle

The mating season for blue crabs is spring through fall. The female blue crab mates after her last molt while her shell is still soft. She is protected from predators by her mate, who carries her until her shell hardens again. After mating the female crab moves into the nearshore waters of the Gulf of Mexico to spawn, or release eggs, while the male stays in the estuary. Although a female blue crab mates only once in her lifetime, she may spawn several times because she is able to store the male's sperm beneath her abdomen and fertilize eggs for future spawnings. Over her reproductive lifespan, she may lay eight to nine million eggs. Until the eggs hatch, the female carries them in a sticky cluster attached to her swimmerets, feathery appendages found in pairs on her abdomen.

Newly hatched larvae, or zoea, are barely visible, resembling dark specks in the water. They begin life in gulf waters and are carried inshore by wind-driven currents, feeding on zooplankton (microscopic animals) or bits of plant debris. By the time the tiny crabs move into the marsh-fringed coastal

estuaries—protective “nursery” areas where they continue to feed and mature—they have molted several times and reached the megalopal stage. Megalopae have claws and can swim and crawl on the bottom, but are only about one-fifth of an inch long. In the estuary, the megalopae undergo six or seven further stages of development, emerging as juveniles. Juvenile blue crabs remain in the estuary from nine months to a year, growing larger through sequential molts. When they reach adulthood, mating takes place, the female returns offshore to spawn, and the cycle begins again.

## Anatomy and Diet

The blue crab is a decapod, which means it possesses ten appendages, of which four pairs are segmented walking legs. Its last pair of legs is paddle-shaped, permitting the crab to swim more actively than most other crab species. These legs, called the paddle fins, are flexible so that they can be rotated in a sculling action that allows the crab to propel itself through the water. The crab is capable of swimming at burst speeds of up to one meter per second.

The largest appendages are a pair of segmented arms ending in pincer-like claws, which the crab uses for defense and to grasp and crush prey. The carapace is the shell that covers and protects the crab. Eyes, mouth, and antennae are located at the front edge of the carapace.

Adult male and female crabs can be easily distinguished from each other by the shapes of their abdomens, which are located on their undersides behind the thorax. The male's abdomen is long and narrow, resembling an inverted “T”, while the female's is triangular if she is immature and rounded if she is mature.

Blue crabs are opportunistic feeders, meaning that they feed on whatever is available among a variety of live and dead animals and plants—for example, oysters, small fish, other crabs, clams, snails, shrimp, and decayed plants. Crabs locate food by smell, touch, and sight, often burrowing into the soft bottom of a tidal channel to wait for prey, leaving only their eyes and antennae exposed. Besides using their sharp claws to attack and capture prey, crabs move their mouths to create currents that bring tiny floating food particles to them. They also use their mouths to scrape food from firm surfaces. In turn, blue crabs are the favored prey of many marine fishes, such as red drum and cobia.

## The Commercial Blue Crab Fishery in Louisiana

The blue crab is an important seafood resource for the state. In 1998, commercial crab fishermen landed over 43 million pounds of hard blue crabs at a value of \$29,345,000 (67 cents per pound). During the same year, 177,000 pounds of soft-shelled crabs, worth \$1.4 million (\$7.91 per pound), were harvested and sold.

Louisiana commercial crab fishermen use baited crab traps made of wire mesh, which are attached to styrofoam floats and placed in the water. A commercial crabber must have a commercial crab gear license. Each trap must carry

a stainless steel tag bearing the crabber's gear license number, and each must have two unblocked escape rings on its outside walls, top and bottom, so that undersized crabs may escape. Crab traps may not be set in navigable channels or entrances to streams and may not be set or checked at night.

There are no legally specified seasons for catching crabs, but they are most abundant from March through October, with peak numbers occurring in April and May. Possession of female crabs carrying egg masses beneath their abdomens is prohibited and if caught, they must be released.

Soft-shelled crabs command higher prices in the marketplace than hard-shelled ones. "Premolt" crabs, or those preparing to molt, exhibit a succession of color changes in their shells and fishermen can tell the approximate time before molting according to the colors of their swimming legs. In the early stages, a new shell beginning to form under the outer one is visible as a line along the inside edges of the next-to-last segments of a crab's paddle fins. At first the line is white, indicating that the crab will molt in one to two weeks. A crab in this stage is called a "peeler." The line gradually changes from white to pink, signaling one week till molting, and then to red, which means that the crab will molt in one to three days. When a split appears along the rear edges of the crab's outer shell, the crab is called a "buster," and will probably molt completely in about 24 hours.

The abundance of the soft-shelled crab harvest depends on the ability of crab fishermen to catch and recognize premolt crabs. Some crab fishermen sell both hard-shelled and soft-shelled crabs, holding the premolts they catch until they molt. Most commercial crabbers, however, sell their premolts to people whose exclusive business is marketing soft-shelled crabs.

## **The Soft-Shelled Crab Industry**

There are about 250 soft-shelled crab producers in Louisiana, selling their product to restaurants, retail seafood markets, wholesale distributors, and individuals. Some are also commercial fishermen who catch not only crabs but also shrimp, finfish, and oysters. Others have jobs unrelated to seafood and produce soft-shelled crabs to generate extra income.

Premolt crabs are harvested in greatest numbers from March through October. Until they shed, peelers can be held in several different kinds of systems. The simplest is the float car, a lightweight box generally made of fiberglass or wood that is floated in the water. The float car may be tended from a boat or hauled up on a wharf. An onboard flow-through system is a shallow box about 16 inches deep that is kept on the deck of a commercial vessel to hold peeler or buster crabs that are caught accidentally in the vessel's trawl nets. Sea water is circulated through the box by a small pump or the box is flushed with a hose. Land-based flow-through systems are fiberglass or fiberglass coated boxes set at table height. Water is pumped through the

boxes from a nearby lake or bayou, returning to the lake after it passes through the system. In a closed or recirculating system, the same water is recirculated, with a filter to keep it clean and free of waste products.

Lake Pontchartrain crabbers often use dip nets to lift peelers from grass beds. Bushlines, sometimes used in Barataria Bay and elsewhere, take advantage of a buster crab's need to seek protection by hiding in bushes. The crabber ties bunches of wax myrtle at intervals along a trot line, then periodically raises and shakes each bush, catching the crabs that fall from it with a dip net.

## **Recreational Crabbing**

Many Louisiana anglers also enjoy recreational crabbing. To use crab traps, either singly or up to 10 on a trot line, a recreational crabber must have a gear license as well as a basic fishing license, both available from the Louisiana Department of Wildlife and Fisheries. Traps used for recreational crabbing are subject to the same regulations as those used in the commercial harvest. The daily per-person bag limit for recreational crabbers is currently 12 dozen, or 144 crabs. As regulations can change periodically, recreational crabbers should check regularly with the Louisiana Department of Wildlife and Fisheries for up-to-date information about licenses, gear requirements, and bag limits.

## **Handling Crabs Safely**

It's important to keep a crab catch alive until it is cooked, because dead crabs decompose quickly. For most recreational crabbers, a cooler is probably the most practical and widely available container for storing and transporting a crab catch, but the cooler should never be filled with water and closed, as the crabs inside will suffocate and die. Live crabs should be kept cool and moist and given some fresh air.

An effective way to handle crabs is to place three or four inches of ice in the bottom of the cooler and cover with waxed cardboard or plastic foam in which holes have been punched. The cardboard keeps the crabs from direct contact with the ice, but the holes allow cool air and moisture to circulate. Place the crabs on the cardboard and cover them with a damp burlap sack. The lid of the cooler should be left ajar so that air can circulate. Crabs can also be stored in wooden crates covered by a damp burlap sack. If ice is put on top of the sack, it will melt and drip down on the crabs, keeping them cool and moist. Whether live crabs are stored in a crate or cooler, they should at all times be kept in the shade.

Before crabs are cooked, any dead ones should be discarded. The rest of the catch should be washed thoroughly to remove dirt and debris. To avoid contaminating cooked crabs, never place them back in the same cooler where the live crabs were stored. Thoroughly clean coolers that were used to store and transport live crabs.

## A GLOSSARY OF TERMS

<b>Crustacean</b>	A group of freshwater and saltwater animals having an external skeleton, jointed legs, and a hard shell made of calcium and chitin. Includes crabs, shrimp, lobsters, and crawfish.
<b>Molt</b>	The process in which a crustacean sheds its hard outer shell in order to grow.
<b>Larva</b>	The newly hatched, earliest stage of growth, which is markedly different in size and form from the adult stage.
<b>Decapod</b>	An animal that possesses 10 appendages; also a subgroup of the class Crustacea.
<b>Nursery</b>	The part of a fish's or animal's habitat where the young grow up.
<b>Gear License</b>	A license, purchased from the state, that permits the owner to use specified types of equipment to catch fish or shellfish. In recreational fishing, for example, gear licenses may be purchased for the use of crab traps, hoop nets, wire nets, trawls, oyster tongs, or crawfish traps, depending on the species sought. The possession of a basic fishing license is required to purchase a gear license.
<b>Zooplankton</b>	Minute animal life floating in a body of water. Forms the primary diet of larval fish and shellfish.
<b>Premolt</b>	A crab, either a peeler or a buster, that is preparing to molt.
<b>Soft-Shelled Crab</b>	A crab that has shed its hard outer shell, exposing the new soft shell underneath. At this stage, the crab may be cooked and eaten with most of the shell intact.
<b>Bag Limit</b>	The maximum number of crabs that a recreational crabber may have in possession in any one day. Currently, in Louisiana, this is 12 dozen, or 144 crabs.

## THINK ABOUT THIS.....

### QUESTIONS FOR DISCUSSION

- Why do crabs shed their shells? Why do you think a crab that is about to molt hides in grass or bushes?
- Why do you think larval blue crabs migrate inshore from the Gulf of Mexico?
- What is a nursery habitat and why is it important for young blue crabs?
- Why do you think crab traps are required to have escape rings?
- Why are limits placed on the number of traps a recreational crabber use? What would happen if there were no limits?
- Why is it important to keep cooked crabs out of the container where live ones were held? What could happen if someone ate a cooked crab that had been returned to the same cooler?

# ANATOMY OF THE MALE AND FEMALE BLUE CRAB

