

# Galveston Bay Shrimp and Crabs

## *Big Links in the Bay's Food Chain*

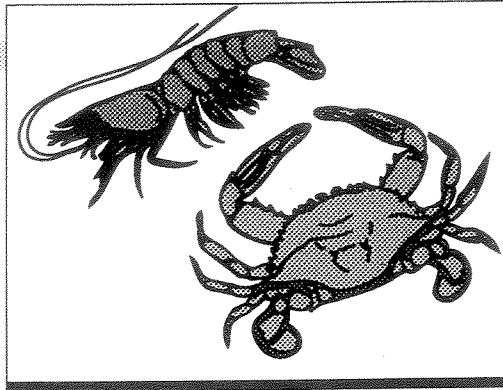
**S**hrimp and crabs are popular seafood items in restaurants and home kitchens the world over. Most people take it for granted that these tiny, tasty crustaceans will be available on demand, and give little thought to where they come from.

Trawling studies by the Texas Parks and Wildlife Department have identified thirteen species of shrimp and seventeen species of crabs in Galveston Bay! Estuarine ecosystems like Galveston Bay are vital to a sustainable population of shrimp and crabs, not only for human enjoyment, but for the many other organisms that depend on them for food.

### Shrimp Species

The Galveston Bay system, like most *estuaries* (semi-enclosed waterbodies where seawater mixes with fresh water from tributaries and runoff), serves as a nursery area for several types of shellfish that have commercial, recreational and ecological importance. The commercial shrimp fisheries depend primarily on **brown shrimp** (*Penaeus aztecus*), and **white shrimp** (*P. setiferus*). **Pink shrimp** (*P. duorarum*) are less common but still important.

In addition to the larger edible species are a number of more obscure varieties of shrimp that include the **mantis shrimp** or **sea louse** (*Stomatopoda*), and **grass shrimp** (*Palaemonetes*). Most species of grass



shrimp are quite small and inhabit grassy shoreline areas of relatively low water salinity. A very large but uncommon member of this group is known as **river shrimp** (*Macrobrachium* spp.). Adults of this species weighing close to a pound are occasionally caught in shrimp trawls in Galveston Bay.

Shrimp generally inhabit the estuary from spring through fall, although each species has its own distinct seasonality. Mating and spawning of brown, white and pink shrimp occurs in nearshore Gulf waters, with browns being found in slightly greater depths. Up to a million fertilized eggs are released from a single spawning female. They hatch within 24 hours, complete several molts while undergoing metamorphosis, and are carried into Galveston Bay as postlarvae by tides and currents. Postlarvae of brown shrimp enter the Bay mainly during spring months; white shrimp in the summer, and pink shrimp in the fall. Juvenile shrimp become large enough for the live bait and bay commercial fisheries in about 60 days. As shrimp mature they move outside the estuary to spawn, completing the cycle.

### Crab Species

**Stone crabs** (*Menippe* spp.) are characterized by a relatively small brown body and a pair of large and rounded crushing claws. They were once common enough in middle and West Galveston Bays to support a commercial fishery. Their numbers have declined in recent years, but there are still enough "stoneys" around to provide a tasty meal of stone crab claws for some lucky crabber.

**Hermit crabs** (*Clibranarius* spp.) are loners that occupy vacated **gastropod** (molluscs, including snails) shells. They are scavengers and an entertaining curiosity to humans.

**Fiddler crabs** (*Uca* sp.) are so called because the male has one large elongated claw that is held across his face. They dig burrows in the silt and mud for protection, and feed on **detritus** (decaying plant matter) along the shoreline vegetated with smooth cordgrass.

**Blue crabs** (*Callinectes sapidus*) are the most conspicuous and economically important crab species in Galveston Bay. The most common and widespread large crab in eastern North American estuaries, blue crabs can tolerate environmental extremes, including high salinity, low dissolved oxygen, and a wide range of temperatures. These aggressive scavengers typically inhabit shallow waters in moderately saline estuaries. Blue crabs

## Recreational Harvest

Recreational crabbing is a favorite activity during the warmer months. (Blue crabs "bury up" in the bottom mud during cold winter months.) Crab lines baited with a fish, soup bone or chicken neck, and dip net, crab rings or crab traps are all suitable crabbing methods. A fishing license and salt water stamp are required for crabbers over 16 and under 65 years old. Citizens should check the game laws concerning the taking of blue crabs.

Shrimp can be caught with a cast net, trawl or minnow seine (20 feet or less). They can be taken from major bays and bait bays only. No shrimping is allowed in nursery areas. Seasons, limits and uses are strictly regulated and enforced. Citizens should become familiar with the law before catching shrimp.

Unfortunately, *hot spots* (areas where toxics exist at high levels) remain in some areas of the Bay. The Texas Department of Health (TDH) has issued a *seafood consumption advisory* for blue crabs and catfish landed from the Houston Ship Channel and Galveston Bay north of a line from Red Bluff to Houston Point. Women of childbearing age and children, as well as people with immune system disorders, should not eat these species taken from these areas. Others are advised to eat no more than one meal per month consisting of these seafoods. Reputable seafood dealers do not knowingly purchase from crabbers harvesting in the advisory areas. Recreational crabbers should be careful where they harvest blue crabs. For more information, call the Texas Department of Health seafood office at (512) 719-0215.

may live several years; however, they are considered an "annual crop." Female crabs move to different parts of the bay based on their breeding cycle, but they prefer the higher salinity areas near the passes into the Gulf. *Sponge females* (blue crabs carrying ripening fertilized eggs under their abdomen) are most often found in the Gulf along the beachfront, where they travel to lay their eggs. Male blue crabs prefer lower salinity water and rarely venture out of the Bay.

As in shrimp, newly hatched blue crab larvae (*zoea*) look nothing like adults. After several molts the final larval stage, called *megalops*, migrates into the estuary primarily in the fall. Juvenile blue crabs spend the winter months in the estuary and become catchable adults the following year.

## Value to Galveston Bay

In an ecological sense, both shrimp and crabs are an important link between *primary producers* (marsh plants, algae, seagrasses) and *upper level consumers* (other fish and invertebrates, birds, and humans). They convert plant material into shrimp or crab *biomass*, (the total mass of living organisms) by eating it, and they also eat the small *infaunal* (benthic, or mud-dwelling) worms and crustaceans that also consume plant matter. Shrimp and crabs are subsequently preyed on by fishes, birds, sea turtles and humans.

Landings of penaeid shrimp and blue crabs increased during the 1980's (probably due to increased fishing pressure and changes in harvesting technology) and are likely being harvested at or above sustainable levels. In 1993, com-

mercial fishermen in Galveston Bay landed 3.4 million pounds of penaeid shrimp (live bait and table shrimp) worth \$5.4 million. In 1990 (the most recent available figures), 1.91 million pounds of blue crabs worth \$1.84 million were harvested from Galveston Bay. The monetary value of these species is even higher when landings and value represented by recreational fisherman are included.

## No Wetlands, No Seafood

The most critical sources of disturbance to both shrimp and blue crabs involve loss of nursery habitat, changes in freshwater inflow, and commercial and recreational fishing. Nursery habitat consists of shallow-water vegetated areas (*intertidal marshes*) around the periphery of the Bay. Where shoreline vegetation is present, whether it be fresh or salt marsh, seagrass or submerged freshwater plants, both shrimp and crabs are more abundant than in areas with bare, sandy or mud bottoms. Dredging and filling of wetlands, construction of canal subdivisions and bulkheading, as well as loss of shoreline vegetation through *subsidence* (lowering of the land surface due to groundwater withdrawal) and sea level rise (due to global warming) will threaten these wetland resources. In addition, floods and subsequently lowered salinities are known to decrease fisheries harvests, as do alterations to the natural seasonality of freshwater inflows into the Bay. Resource agencies have already noted increases of fishing effort (i.e. more boats) on shrimp and blue crab populations that have pushed yields down to or below optimal levels.

This fact sheet is one of a series produced through a cooperative agreement between the Galveston Bay Foundation and the U.S. Fish and Wildlife Service. The information in this series was developed by authors from the Galveston Bay Foundation, National Marine Fisheries Service, Sea Grant College Program, Texas Natural Resource Conservation Commission, Texas Parks and Wildlife Department, Texas Water Development Board and the U.S. Fish and Wildlife Service.

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For more information, contact the Galveston Bay Foundation at 17324-A Highway 3; Webster, Texas 77598, or call 713/332-3381.

