



Painting by Clemente F. Guzman III

TEXAS COASTAL WETLANDS



- 1 Shoal Grass (*Halodule wrightii*)
- 2 Widgeon Grass (*Ruppia maritima*)
- 3 Turtle Grass (*Thalassia testudinum*)
- 4 Marshlike Cordgrass (*Spartina patens*)
- 5 Smooth Cordgrass (*Spartina alterniflora*)
- 6 Perennial Glasswort (*Salicornia virginica*)
- 7 Saltwort (*Batis maritima*)
- 8 Carolina Wolfberry (*Lycium carolinianum*)
- 9 Bushy Sea Oxeye (*Borreria frutescens*)
- 10 Polycharis (*Nereis* sp.)
- 11 Marsh Periwinkle (*Littoraria irrorata*)
- 12 Lightning Whelk (*Busycon perversum pulleyi*)
- 13 Atlantic Bay Scallop (*Argopecten irradians amplicostatus*)
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Whooping Crane

Grus americana



TPWD PHOTO



Whooping cranes are one of the rarest bird species in North America. Although they breed in Canada during the summer months, whooping cranes migrate to Texas' coastal plains near Rockport for the winter months.

COASTAL WETLANDS

Whooping Crane

Grus americana



APPEARANCE

Height: 5 feet (1.5 m)

Wingspan: 7.5 feet (2.3 m)

Distinguishing Characteristics

- White with rust-colored patches on top and back of head
- Black feathers on both sides of the head
- Yellow eyes
- Primary wing feathers are black but are visible only in flight.
- Long, black legs and bills

LIFE HISTORY

Range: Limited in Texas to the migratory flyway and coastal plain around Aransas.

Diet: Crabs, clams, crayfish, snails, minnows, frogs, larval insects and leeches; occasionally voles, lemmings and shrews; sometimes acorns and small fruit

Sexual maturity: Between three and five years

Mating season: Early spring

Nest: Made of bulrushes about 4 feet (1.2 m) wide with a flat-topped central mound up to 5 inches (12 cm) above the water

Eggs: Two

Incubation: 29 to 31 days

Young: Generally, one chick survives. It can leave the nest while quite young, but is still protected and fed by its parents. Chicks are rust-colored when they hatch; at about four months, chicks' feathers begin turning white. By the end of their first migration, they are brown and white, and as they enter their first spring, their plumage is white with black wing tips.

Life span: Up to 24 years in the wild

HABITAT

Whooping cranes winter on the Aransas National Wildlife Refuge's 22,500 acres of salt flats and marshes. The area's coastal prairie rolls gently here and is dotted with swales and ponds. They summer and nest in poorly drained wetlands in Canada's Northwest Territories at Wood Buffalo National Park.

BEHAVIOR

Whooping cranes begin their fall migration south to Texas in mid-September and begin the spring migration north to Canada in late March or early April. They mate for life, but will accept a new mate if one dies. The mated pair shares brooding duties; either the male or the female is always on the nest. The hatchlings will stay with their parents throughout their first winter, and separate when the spring migration begins. The sub-adults form groups and travel together.

NOW YOU KNOW!

- Whooping cranes live in "families" with two adult birds, a male and a female, and one or two of their young. Whooping cranes migrate more than 2,400 miles a year.
- As many as 1,400 whooping cranes migrated across North America in the mid-1800s. By the late 1930s, the Aransas population was down to just 18 birds. Because of well-coordinated efforts to protect habitat and the birds themselves, the population is slowly increasing. In 1993, the population stood at 112. In the spring of 2002, it is estimated that there were 173 whoopers—a small, but important increase.
- Today, three populations exist: one in the Kissimmee Prairie of Florida, the only migratory population at Aransas National Wildlife Refuge, and a very small captive-bred population in Wisconsin.

WHOOPING CRANES AND PEOPLE

Whooping cranes are protected in Canada, the United States and Mexico. Because some of their habitat is federally protected, the land is managed to preserve the animals. The greatest threats to whooping cranes are man-made: power lines, illegal hunting, and habitat loss. Because the Gulf International Waterway goes through their habitat area, the cranes are susceptible to chemical spills and other petroleum-related contamination. Public awareness and support are critical to whooping cranes' survival as a species.

Common Raccoon

Procyon lotor



Raccoons are curious, unique, and intelligent creatures. These characteristics help them survive in the wild, but can also make for annoying neighbors. Though they prefer woodlands, they can live practically anywhere and have adapted well to human habitats.

Common Raccoon

Procyon lotor



APPEARANCE

Length: 33 to 45 in. (84 to 104.5 cm)

Weight: 7 to 20 lb. (3 to 9 kg)

Distinguishing Characteristics

- Gray, with dark black markings around their eyes, and black bands on their tail
- Belly and muzzle are lighter colored while the feet are darker gray.
- Coat is medium length and coarse, and the tail is very bushy.
- Dexterous hands. Hands and feet have five fingers and toes.
- Stocky with short legs
- Small rounded ears

LIFE HISTORY

Range: North America

Diet: Fruits and nuts, insects and aquatic invertebrates, fish, small rodents, frogs, bird eggs, carrion and human garbage

Predators: Owls, coyotes, bobcats and humans

Sexual maturity: Male: 2 years; female: 1 year

Mating season: Mid to late summer

Gestation and birth: 60 to 74 days; four cubs

Young: Baby raccoons' ears and eyes open about 18-24 days after birth. They can walk around by the time they are four to six weeks old. Although they are weaned by three months, they remain with their mothers for another year.

Life span: 10 to 15 years



HABITAT

Raccoons prefer brushy or wooded areas near streams, lakes or swamps, although they can live close to developed areas if sufficient food, water and cover are provided.

BEHAVIOR

Raccoons are almost exclusively nocturnal. During the day they sleep in dens in the trees. During cold winter periods, they may sleep for an extended period, but do not hibernate. They are primarily solitary, and will only gather with other raccoons during breeding season. Raccoons are *polygamous*, they have a number of partners. Males do not stay to help raise the young.

NOW YOU KNOW!

- Raccoons have excellent night vision and an acute sense of hearing.
- They are very agile climbers and strong swimmers.
- They use their nimble fingers to feel stream bottoms for food, to climb trees and to open containers and garbage cans. They can find their way into a house to get food.
- Home ranges are about 3-4 square km, about half as small for females.

COMMON RACCOONS AND PEOPLE

The name "raccoon" came from an Algonquian Indian word *arakun*, which means "he scratches with his hands." During the 1700s, American colonists dropped the "a" in *arakun*, and the name became raccoon.

Wild raccoons accustomed to being fed by well-intentioned people will generally lose their natural fear of humans and seek to move closer to their food source—your house. Once raccoons take up residence in an attic or outbuildings they can become very destructive and difficult to remove. Malnutrition, diseases like rabies, and predation by humans, coyotes and bobcats take their toll, but raccoon populations are not in decline in most areas of Texas.

Piping Plover

Charadrius melodus



TPWD PHOTO



The piping plover is a “winter Texan,” living on the beaches and tidal mudflats of the Texas coastline and migrating north in the spring. This beautiful little bird finds it hard to survive habitat loss and is listed as a threatened species.

COASTAL WETLANDS

Piping Plover

Charadrius melodus



APPEARANCE

Height: 6 to 7.5 inches (15 to 19 cm)

Wingspan: 15 inches (31 cm)

Distinguishing Characteristics

- Sandy-colored with grayish-brown crowns and backs
- White foreheads and dark bands across their crowns
- Dark, but incomplete rings around their necks.
- Yellow-orange legs, black bands across their foreheads from eye to eye, and black rings around the base of their necks.
- Small, stocky, sandy-colored birds that resemble sandpipers.
- Short, stubby bills

LIFE HISTORY

Range: From Canada south through the central United States to Texas. They winter primarily along Gulf Coast beaches and the Atlantic coast from North Carolina south to Florida.

Diet: Marine worms, beetles, spiders, crustaceans, mollusks and other small marine animals

Predators: Gulls, crows, raccoons, foxes and skunks are threats to the eggs and falcons may prey on the adult birds.

Sexual maturity: At one year

Mating season: Late March through April

Nest: Scrape shallow depression in the sand about 1 by 2.5 inches (2.5 by 6 cm)

Eggs: Four gray to pale sand-colored eggs with a few dark spots

Incubation: 25 days

Young: Born within four to eight hours of each other, and fledge 30 to 35 days later

Life span: Less than five years, but on occasion, up to 14 years

HABITAT

Piping plovers prefer sand and gravel shorelines, river sandbars and islands.

BEHAVIOR

Males compete against each other for females' attention. They perform elaborate flights, and then scrape nests in the sand, tossing shells and small stones and twigs into them with their beaks. After their nests are built, they stand beside them with their wings partially spread and tails fanned. The males repeat this behavior until a female indicates interest. Once he has her attention, he begins a high-stepping "dance," continuing the courtship ritual. Although both sexes share responsibility for incubating the eggs, females commonly leave the young when the hatchlings are 14 to 20 days old. Males often remain with them until they can fly.

The chicks can move freely from their nests within hours of drying off. When predators or intruders come close, the young squat motionless on the sand while the parents attempt to attract the attention of the intruders to themselves, often by feigning a broken wing. The young plovers and adult plovers generally return to the same nesting area year after year.

Plovers often run short distances, pausing to stare at the sand with a slightly tilted head, before picking a food item from the sand. When not feeding, plovers rest and preen.

NOW YOU KNOW!

- There are just over 5,000 known pairs of breeding piping plovers.
- Texas is the wintering home for 35 percent of the known population of piping plovers. They begin arriving in late July or early August, and will remain for up to nine months.

PIPING PLOVERS AND PEOPLE

Piping plovers were common along the Atlantic coast during much of the nineteenth century, but were hunted nearly to extinction for the *millinery* (hat) trade. Following passage of the Migratory Bird Treaty Act in 1918, their population peaked in the 1940s. The current population decline is attributed to increased development and recreational use of beaches since the end of World War II. Although it is listed as threatened in Texas, it is listed as endangered in several Midwestern states. Vehicular and foot traffic and pets playing on the beach may destroy the birds and eggs and disrupt the species' breeding grounds as well. Beach raking and other recreational uses degrade their wintering sites in Texas.

Texas Diamondback Terrapin

Malaclemys terrapin littoralis



Texas diamondback terrapins were once hunted to the brink of extinction because many people thought that they were especially delicious in soup.

COASTAL WETLANDS

Texas Diamondback Terrapin

Malaclemys terrapin littoralis



APPEARANCE

Shell length: Females: 6 to 9 inches (15 to 22 cm);

Males: 4 to 5.5 inches (10 to 14 cm)

Distinguishing Characteristics

- Dark *carapace* (upper shell)
- Pale *plasteron* (lower shell)
- Diamond-shaped *scutes* (plates that form the carapace)
- Strongly webbed feet and unusually large back feet

LIFE HISTORY

Range: From Louisiana to Corpus Christi Bay

Diet: Crabs, shrimp, bivalves, fish and insects

Predators: Humans, raccoons, skunks and crows

Sexual maturity: Males at three years, females at six years

Mating: Spring

Nesting: After mating in the water, females come ashore and dig a tear-shaped nest in the sand above the high-tide line.

Eggs: Four to 18 eggs

Incubation: 60 to 100 days depending on local conditions, especially temperature

Young: If temperatures are warmer, her nest will produce more females; if temperatures are cooler, then the nest will produce more males. If the eggs do not hatch before winter sets in, the hatchlings will spend the winter in the nest and will emerge when the weather warms.

Life span: Up to 40 years

HABITAT

Diamondback terrapins prefer brackish or salt water. They are the only turtle found in estuaries, tidal creeks, and saltwater marshes where the salinity comes close to that of the ocean.

BEHAVIOR

Texas diamondback terrapins are solitary except when breeding. An individual female breeds every four years or so. Occasionally, adult diamondbacks may dig into the mud to hibernate over the cold winter months. During the day terrapins spend most of their time in the water or basking in the sun. At night terrapins bury themselves in mud.

NOW YOU KNOW!

- Diamondbacks can adjust their water needs depending on how salty the water is. When their systems become too salty, diamondbacks secrete salt from their tear ducts to help regulate their salt levels.
- Texas diamondbacks are one of seven subspecies of *Malaclemys terrapin* recognized by scientists.

TEXAS DIAMONDBACK TERRAPINS AND PEOPLE

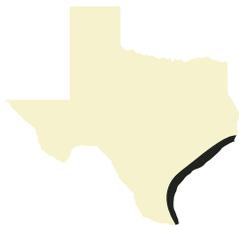
Some believe that Prohibition helped save terrapins. Turtle soup was made with wine during the 1920s. When Prohibition laws made possessing wine illegal, turtle soup fell out of favor and thousands of trapped turtles were released into the ocean. Today, most terrapins are killed by speeding cars or become trapped in baited blue crab traps and drown.

Atlantic Croaker

Micropogonias undulatus



TPWD PHOTO

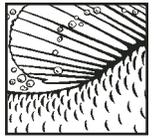


The Atlantic croaker is one of the most abundant fishes in North American coastal waters. It is an important commercial fish as well as an important sport fish.

COASTAL WETLANDS

Atlantic Croaker

Micropogonias undulatus



APPEARANCE

Length: 12 inches (30 cm)

Weight: 1/2 to 2 pounds (226 g to 0.9 kg)

Distinguishing Characteristics

- Three to five pairs of small *barbels* or "whiskers" on their chins help them feel for food on the sea floor.
- Lateral line extends to tip of *caudal* (tail) fin.
- *Inferior* mouth (located to the bottom of the head facing the ground)
- Brown vertical stripes on its sides
- Adults—silver with a pinkish cast
- Young—silvery and iridescent
- Older fish are brassy in color with vertical brown streaks formed by spots that are on their scales.

LIFE HISTORY

Range: Atlantic coast from Massachusetts southward and throughout the Gulf of Mexico

Diet: Shrimp, crabs and *detritus* (dead and decomposing plant and animal matter)

Predators: Striped bass, shark, spotted seatrout, other croakers and humans

Sexual maturity: Along the Gulf Coast, at about one year old. This varies in other areas.

Spawning season: Fall, with peak between August and October

Eggs: Between 100,000 and 2 million eggs, each about 0.35 mm in diameter

Young: After hatching, the *larvae* (immature stage) drift toward land. They are abundant on soft bottoms, such as mud, where there are large amounts of detritus for them to feed on.

Life span: Up to eight years

HABITAT

Atlantic croaker prefer estuaries and bays through the spring and summer, then travel offshore in the fall to breed.

BEHAVIOR

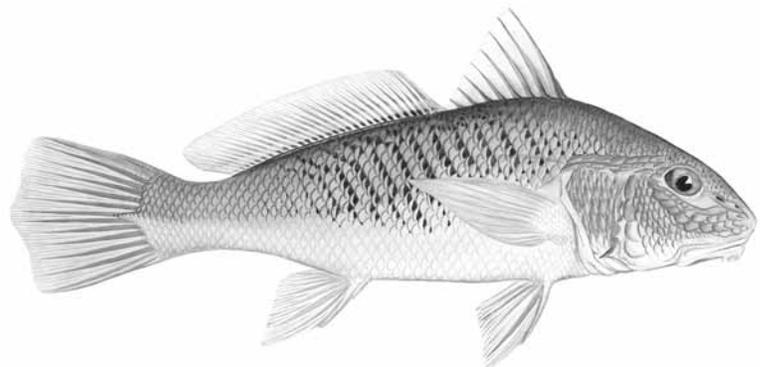
Atlantic croaker "croak" by vibrating their swim bladders with special muscles as part of their spawning ritual. A swim bladder is a pocket full of air inside the fish that helps keep it afloat and facing upright. This behavior attracts females.

NOW YOU KNOW!

- Atlantic croaker are also called hardheads, King Billies and grumblers.
- Croaker that live in the northern part of their range mature later and live longer than those in the southern part of their range.
- Because of predation, more than 95% of the Atlantic croaker population dies every year.
- Atlantic croaker should not be eaten raw because they may pass *trematodes* (parasites) to humans.
- The croaker is closely related to spotted seatrout and red drum.

ATLANTIC CROAKER AND PEOPLE

The Atlantic croaker is a very important commercial fish. Millions of pounds are caught and sold every year in the United States and exported to other countries. The annual catch of croaker has declined in the past few years, probably due to over fishing. The best times for fishing for Atlantic croaker are from summer into the fall. They are easily caught on bait (dead shrimp) when fishing on the bottom. Small Atlantic croaker are used as a bait fish to catch other fish, especially spotted seatrout (*Cynoscion nebulosus*) and crabs.



Kemp's Ridley Sea Turtle

Lepidochelys kempii



For more than 150 million years, sea turtles have roamed the earth. Although many sea turtle species are in danger, the Kemp's Ridley sea turtle is the most endangered species worldwide.

COASTAL WETLANDS

Kemp's Ridley Sea Turtle

Lepidochelys kempii



APPEARANCE

Length: 27 to 32 inches (68 to 82 cm)

Weight: 75 to 100 pounds (33 to 45 kg)

Distinguishing Characteristics

- Dark gray to gray-green *carapace* (upper shell)
- Cream to tan *plasteron* (lower shell)
- Streamlined shells
- Appendages shaped like flippers

LIFE HISTORY

Range: Warm, shallow shore waters throughout the Gulf of Mexico and along the Atlantic Ocean

Diet: Crabs, clams, jellyfish, shrimp, sea stars and fish

Predators: Humans (hunting, boat propellers, nets, and refuse), followed by natural predation by shore birds, sharks and other sea animals

Sexual maturity: At about 10-15 years for females. Little is known about the males.

Mating: Females may nest two or three times per breeding season.

Nesting: The females come ashore and dig a deep nest in the beach sand.

Eggs: 100 soft, round white eggs about the size of ping pong balls.

Incubation: 45 to 60 days with approximately 75 percent of the eggs hatching.

Young: About 125,000 hatchlings leave nests on North American shores, but only one percent of those will survive to sexual maturity. As hatchlings, Ridelys weigh about 0.5 ounces (14 g) with a shell the size of a half-dollar.

Life span: Up to 50 years

HABITAT

Kemp's Ridelys prefer open ocean and gulf waters with the females only coming ashore to lay eggs in beach sand. Young turtles float on large mats of *sargassum* (a type of brown algae) in the Gulf of Mexico and Atlantic Ocean.

BEHAVIOR

The male Kemp's Ridley spends its entire life in the water while the female only comes ashore to nest, sometimes joining large groups of nesting females called *arribazones*. A female will only lay eggs during the day. She will come back to the same beach to nest year after year. Some scientists believe that baby sea turtles may remember, or "imprint" on, the particular smell, chemical make-up, or magnetic location of the beach where they hatched. Others point out that sea turtles have magnetite, an iron ore, in their brains that they may use to navigate along the Earth's magnetic fields.

NOW YOU KNOW!

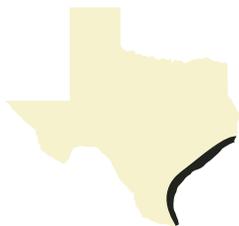
- If the water grows cold, these sea turtles can adjust their metabolic rate and can remain underwater for hours.
- Turtles can go two to three months without food.
- Sea turtle "tears" are their way of ridding their body of salt-water through special glands.
- Eggs placed in a warm incubator tend to hatch as female turtles. Eggs kept at cooler temperatures hatch as males.
- The Kemp's Ridley is the smallest of all the sea turtles.
- It is also known as the *tortuga lora* in Mexico, which means "parrot turtle" in reference to the beak-like shape of its head.

KEMP'S RIDLEY SEA TURTLES AND PEOPLE

The Kemp's Ridley sea turtle was placed on the Endangered Species List in 1970. Over the centuries, people have harvested the eggs and killed the turtles for their meat and leather-like skin. Between the 1940s and 1960s, the population crashed as people harvested truckloads of eggs and sold them in small towns in Texas and Mexico. More recent threats include suffocation in shrimpers' large nets and ingesting floating trash that they mistake for food. Governments of the Mexican states of Tamaulipas, Colima and Jalisco were the very first to become involved in the protection of sea turtle eggs. The nesting beach at Rancho Nuevo, Tamaulipas, Mexico is the primary nesting site for these turtles. It is the only known major nesting beach for this species in the world. Thanks to the work of a large team of scientists, a secondary nesting population has been established on Padre Island National Seashore. To continue the success of this secondary site, citizens are asked to leave the animals alone, but report any sightings to a park ranger or local game warden.

Spotted Seatrout

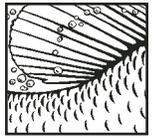
Cynoscion nebulosus



The spotted seatrout, commonly called speckled trout, is one of the most popular sport fish along the Texas coast. It occurs in the western Atlantic and Gulf of Mexico, ranging from Massachusetts to the Yucatan peninsula.

Spotted Seatrout

Cynoscion nebulosus



APPEARANCE

Length: Males: average 19 inches (48 cm)

Females: 25 inches (63 cm)

Weight: 2 to 3 pounds (1 to 1.3 kg)

Distinguishing Characteristics

- Dark gray or green back with distinct round spots on back, fins and tail
- Silvery-white below
- Black margin along the edge of tail
- Soft *dorsal* (back) fin has no scales
- One or two prominent canine teeth usually present at tip of upper jaw

LIFE HISTORY

Range: Bays along the Atlantic Coast and Gulf of Mexico

Diet: Small trout feed primarily on small crustaceans. Medium-size trout feed on shrimp and small fish. Large fish feed almost exclusively on other fish.

Predators: Alligator gar, striped bass, Atlantic croaker, tarpon and barracuda

Sexual maturity: At one to two years

Spawning season: February through October

Eggs: 100,000 to a million

Incubation: 16 to 20 hours after fertilization

Life span: Up to ten years

HABITAT

Spotted seatrout prefer shallower bays and estuaries with oyster beds and seagrass beds that attract prey species.

BEHAVIOR

A female spotted seatrout may spawn several times during the season. Younger females may release 100,000 eggs and older, larger females may release a million eggs. Recent studies indicate that spotted seatrout spawn between dusk and dawn and usually within coastal bays, estuaries and lagoons. They prefer shallow grassy areas where eggs and larvae have some cover from predators. Spotted seatrout swim near seagrass beds of shallow bays and estuaries during spring and summer, looking for prey. As water temperatures decline during fall, they move into deeper bay waters and the Gulf of Mexico. As water temperatures warm in the spring, the fish return to the shallows of the primary and secondary bays.

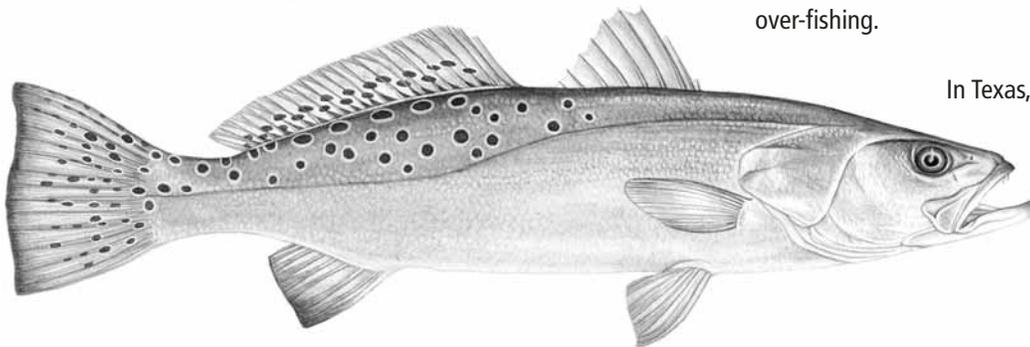
NOW YOU KNOW!

- Some trout caught may have worms embedded in the flesh along the backbone. These "spaghetti" worms are larval stages of a tapeworm that can only reach maturity in sharks. The worms cannot survive in man even if the seatrout is eaten raw. The worms can easily be removed when the fish is cleaned to make the meat more appealing.
- The fish is a member of the croaker family (Sciaenidae) and is a first cousin to the Atlantic croaker, red drum, black drum, and sand seatrout.

SPOTTED SEATROUT AND PEOPLE

Its abundance, willingness to hit natural and artificial baits, and fine eating qualities make the species extremely popular with anglers. It has been commercially harvested in all the states bordering the Gulf of Mexico. However, a decline in harvest of spotted seatrout in recent years caused Alabama and Texas to close commercial fishing of the species. The decline in the seatrout catch is linked to destruction of seagrass beds and over-fishing.

In Texas, the record spotted seatrout caught was 33.75 inches (85.7 cm) and 13 pounds 9 ounces (about 6 kg).



Sheepshead Minnow

Cyprinodon variegatus



PHOTO BY CARL FRANKLIN

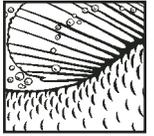


Sheepshead minnows are an important link in the coastal food chain. They eat plant materials including algae, and are then eaten by larger fish, turtles and wading birds.

COASTAL WETLANDS

Sheepshead Minnow

Cyprinodon variegatus



APPEARANCE

Length: Generally about 1.8 inches (4.6 cm); largest was 3.7 inches (9.3 cm)

Distinguishing Characteristics

- Silver, tubby bodies
- One *dorsal* (back) and one *anal fin* (fin closest to tail)
- No lateral line

LIFE HISTORY

Range: Along the Atlantic Coast and the Gulf of Mexico and south along the South American coastline

Diet: Plant material, algae, *detritus* (decomposing dead/animal matter), mosquitoes and smaller fish

Predators: Red drum, spotted seatrout, Atlantic croaker, turtles and some wading birds

Sexual maturity: At three months

Spawning season: In colder water, spawning occurs February through October; in warm waters, spawning can last throughout the year.

Nests: Males construct nest pits in bay bottoms to attract females.

Eggs: Females can spawn several times during the spawning season at 1-7 day intervals, depositing between 100 to 300 eggs per spawning period.

Incubation: From 4 to 12 days, depending on temperature

Young: Larvae have a total length of 0.16 inches (4 mm) when hatched and are yellowish in color. Hatching typically occurs during spring and summer.

Life span: Unknown

HABITAT

Sheepshead minnows are *euryhaline* (they can be found in freshwater as well as saltwater). They prefer quiet, shallow waters and have been found in saltwater bays and estuaries, as well as coastal inland areas such as creeks, canals and ditches.

BEHAVIOR

When mating, males turn bright blue, fiercely defending their nests. Sheepshead minnows dig into sediment to hide from predators or seek refuge from very warm or cold water. Sometimes, they hide in seagrass or algae. They travel in schools, especially when they have been frightened.

NOW YOU KNOW!

- This fish can live in water so shallow that it may be the only species there.
- They can survive water that has been deprived of oxygen by gulping air at the water's surface.
- Sheepshead minnows are also referred to as variegated minnow, sheepshead killifish, sheepshead pupfish, broad killifish and chubby.
- In one laboratory study, a single female sheepshead minnow produced 1,028 eggs over a 28-day period.
- The eggs are adhesive and stick to plants, the bay bottom and to each other.

SHEEPSHEAD MINNOWS AND PEOPLE

Sheepshead minnows are used by humans in a variety of ways: some fisherman use them as bait, collectors keep them in saltwater aquariums as pets and the Environmental Protection Agency studies sheepshead minnows to determine pollution levels in certain bodies of water.

Reddish Egret

Egretta rufescens



TPWD PHOTO



The reddish egret, a beautiful wading bird, is a permanent resident of the Texas coast. Although recognized as one species, reddish egrets may be either white (white phase) or gray with a reddish or rusty colored head and neck (dark phase). It is currently listed in Texas as a threatened species.

COASTAL WETLANDS

Reddish Egret

Egretta rufescens



APPEARANCE

Height: 27 to 32 inches (68 to 82 cm)

Wingspan: 46 to 49 inches (116 to 124 cm)

Distinguishing Characteristics

- Two distinctly different color phases:
 - Dark phase
 - Gray with reddish head and neck feathers
 - Bluish legs
 - Pink bill with a dark tip
 - White phase
 - White feathers
 - Bluish legs
 - Pink bill with dark tip
- Long shaggy plumes on their heads and necks during breeding season

LIFE HISTORY

Range: Along the Gulf Coast of Texas and some parts of Louisiana; also found in Southern Florida. Rare along the Gulf Coast of Mexico, West Indies and Baja California.

Diet: Small fish, frogs, tadpoles and crustaceans

Predators: Raccoons, coyotes and great-tailed grackles destroy eggs and eat young.

Sexual maturity: At three to four years

Mating season: Early March through late July

Nests: Made of sticks either on the ground or in a bush or tree up to 20 feet (6 m) high. In Texas, nests are built mostly on the ground near a bush or prickly pear cactus or on an oyster shell beach. The nest may be up to 10 inches (25.4 cm) thick with a diameter of 12 to 26 inches (30 to 66 cm).

Eggs: Three to four; smooth and pale blue-green in color with no markings

Incubation: Unknown, but estimated to be 25-26 days

Life span: Up to 12 years

HABITAT

Reddish egrets are most often found in salt and brackish water wetlands.

BEHAVIOR

Both parents build the nest, and sticks are continuously added to the nest during incubation. Reddish egrets sometimes nest alongside other birds such as herons, egrets, cormorants and spoonbills. The reddish egret is *crepuscular* (it is most active at dawn and dusk). When feeding, reddish egrets will spread their wings to create shade and reduce glare so that they can see their prey more easily in the water. When chasing fish, they also run in circles. Reddish egrets use their long, spear-like bills to stab their prey. After feeding, reddish egrets regurgitate all the inedible parts of their prey, such as bones, much like owls do. Parents feed their young by regurgitating into the chicks' mouths.

NOW YOU KNOW!

- Two dark phase birds can have white phase chicks, but two white phase birds can never have dark phase chicks. When a dark phase bird and a white phase bird mate, their chicks are almost always dark phase. The white phase of the reddish egret was once thought to be a completely different species.
- In Texas, only 10 to 20 percent of the reddish egret population is white phase. In the 1950s, just four percent of the whole United States' population was white phase.

REDDISH EGRETS AND PEOPLE

Until the late 1800s, reddish egrets were hunted for their feathers, which were used to decorate ladies' hats and clothing. The entire United States population of reddish egrets was nearly exterminated by hunters. The reddish egret completely disappeared from Florida. In 1918, the Migratory Bird Treaty Act was passed, finally protecting reddish egrets and other birds from plumage hunters. Although their populations are still recovering, it is a slow process. There are only 1,500 to 2,000 nesting pairs of reddish egrets in the United States—and most of these are in Texas. Intrusion of habitat by recreationists, pesticide runoff and land development all harm the reddish egret's habitat.

Roseate Spoonbill

Ajaia ajaja



Roseate spoonbills' wide, spoon-shaped beaks are super-sensitive. The birds use them to stir water and find food in saltwater and freshwater marshes along the Gulf Coast.

COASTAL WETLANDS

Roseate Spoonbill

Ajaia ajaja



APPEARANCE

Height: 32 inches (81 cm)

Wingspan: 50 inches (127 cm)

Distinguishing Characteristics

- Pink body and legs
- White neck and breast
- Pale-green bald head
- Spoon-shaped bill
- Bright red shoulder patch

LIFE HISTORY

Range: Entire Gulf of Mexico coastline, south to Central America, South America and West Indies

Diet: Primarily small fish and crustaceans

Predators: Raccoons and coyotes eat eggs and young.

Sexual maturity: At approximately 16 weeks

Mating season: March through June in Texas

Nests: Built in thick vegetation above water; are well-built and deeply cupped

Eggs: Two to five; brown-speckled white

Incubation: About 24 days

Young: In about eight weeks, the young roseate spoonbills are ready to fly.

Life span: Ten years

HABITAT

From March through October, roseate spoonbills prefer the bays, marshes and estuaries along the Gulf Coast. Occasionally they will travel inland through the eastern third of Texas. In winter, most roseate spoonbills migrate to Central and South America.

BEHAVIOR

Unlike most birds, roseate spoonbills are silent and often solitary when they feed. They swish their spoon-shaped bills back and forth in the water to find small invertebrates, fish and crustaceans. During breeding season, the male uses gifts of nesting material to attract the female. Once mated, the pair remains monogamous. Both male and female take turns sitting on the eggs and feeding the young.

NOW YOU KNOW!

- Spoonbills eat shrimp, shrimp eat algae, and the algae make their own red and yellow pigments, called *carotenoids*. Some scientists believe that the pink coloration that roseate spoonbills acquire as they mature is due to their diet of carotenoid-rich organisms like shrimp. The more they eat, the pinker they get.
- Flamingos are close relatives of the roseate spoonbill. They both have pink feathers, but the flamingos are much larger with a longer neck.

ROSEATE SPOONBILLS AND PEOPLE

Like many other bird species with beautiful plumage, roseate spoonbills were nearly hunted to extinction during the 1800s. Their striking pink feathers were popular on women's hats and hunters from all over the United States competed for spoonbill plumes. In the early 1900s, roseate spoonbills began to recolonize areas along the Gulf Coast and slowly increase in number. Today, threats to roseate spoonbill populations come as a result of habitat loss.

Lightning Whelk

Busycon perversum pulleyi



The lightning whelk's shell is a treasure that can often be found along the coast from North Carolina to Texas. Shown with this shell is a strand of egg capsules from which tiny lightning whelk juveniles have emerged.

Lightning Whelk

Busycon perversum pulleyi



APPEARANCE

Shell length: 2.5 to 16 inches (6 to 40 cm)

Distinguishing Characteristics

- Off-white to tan or gray shell with narrow, brown “lightning” streaks from the top of the shell to the bottom; the shell is white on the inside.
- The animal inside the shell is dark brown to black.
- Counterclockwise shell spiral (lightning whelks are usually called “left handed”)

LIFE HISTORY

Range: Along the Gulf Coast

Diet: *Bivalves* (invertebrates with two shells), especially oysters, clams, and scallops

Predators: Gulls, crabs, and other whelks

Mating season: Late October and early January

Spawning season: March and April

Eggs: The female lays eggs in long strings of capsules 11 to 33 inches (27 to 83 cm) long. Each strand has up to 145 capsules and each capsule may contain 20 to 100 eggs. Only about 8 to 13 of the eggs in each capsule hatch.

Young: Juveniles will begin hatching in May and emerge as tiny lightning whelks.

Life span: Unknown

HABITAT

Lightning whelks may be found on the bottom of shallow bays in sand or mud near shoalgrass or turtlegrass meadows.

BEHAVIOR

The carnivorous habits of the whelks begin as hatchlings. The whelks that hatch feed on the eggs that did not hatch. When feeding, an adult whelk will try to pry open a bivalve by inserting the edge of its shell inside the bivalve and using it like a crowbar. If it cannot pry the bivalve’s shell open this way, it will grind the shell with its own shell until it creates a hole large enough to insert its *radula* (toothed tongue). The lightning whelk can “smell” its prey with special sensory organs inside its body and will almost completely bury itself searching for other food.

NOW YOU KNOW!

- Like snails, the lightning whelk is in the class Gastropoda which means “stomach footed.” Gastropods are *univalves* (have only one shell).
- Hermit crabs often make homes of unoccupied lightning whelk shells.
- Lightning whelks leave behind a trail when crawling. It is often easy to track them.
- The shell grows very quickly when the whelk is young as long as food is abundant. As it gets older, the shell grows more slowly. The color of the shell depends greatly on light, temperature and age. Older whelks have pale shells.

LIGHTNING WHELKS AND PEOPLE

Native Americans harvested whelks for religious ceremonies and practical tools. Many tribes believed that the “left handed” spiral made the shells sacred objects, but whelks were also eaten and their shells used as scrapers, gouges and even cups and bowls. Some larger shells can hold up to one quart of liquid. It is believed that sailors even used the egg cases as sponges for bathing. The lightning whelk shell is recognized as the official Texas State Shell.

Gulf Salt Marsh Snake

Nerodia clarkii



In Texas, the gulf salt marsh snake lives where few other water snakes venture—they thrive in brackish waters. Because coastal wetlands are continuously being drained, filled, developed and contaminated, gulf salt marsh snakes run a serious risk of becoming threatened or endangered due to habitat loss.

COASTAL WETLANDS

Gulf Salt Marsh Snake

Nerodia clarkii



APPEARANCE

Length: 15 to 30 inches (38 to 76 cm)

Distinguishing Characteristics

- Two longitudinal tan or yellow stripes on each side of the body make up the *dorsal* (top) pattern of the snake.
- Reddish-brown or grayish-black *ventral* (bottom) color with one to three rows of large pale spots along the center of the belly
- Flat headed

LIFE HISTORY

Range: Along the Gulf Coast

Diet: Small fish, crabs, shrimp and other invertebrates

Predators: Egrets, herons and crabs

Sexual maturity: At three years

Mating season: Early spring

Gestation: Live birth. Born during July and August.

Young: The babies are 7 to 9 inches (17 to 22 cm) long at birth.

Life Span: Up to 20 years

HABITAT

Just as the name indicates, Gulf salt marsh snakes prefer brackish and saltwater estuaries, salt marshes and tidal mud flats.

BEHAVIOR

As a way to avoid predators, salt marsh snakes are *nocturnal* (active at night) and often hide in shoreline debris and in crab burrows in the mud or sand.

NOW YOU KNOW!

The gulf salt marsh snake does not have salt glands to help rid itself of the salt it eats so it must be very careful not to drink salt water. It gets moisture from rainfall and from the animals it eats.

GULF SALT MARSH SNAKES AND PEOPLE

Because they are difficult to find, we know relatively little about gulf salt marsh snakes. When they are found, people often confuse the non-venomous gulf salt marsh snake with venomous species such as the cottonmouth. The general shape of a poisonous snake's head is triangular while a non-poisonous snake's head is slender and almost flush with the rest of its body. If you look at a cottonmouth from above, you can see the eyes. You can't see the eyes of a water snake from above. They are on the sides of the snake's head. Water snakes' eyes have a round pupil; the cottonmouth (and other pit vipers) have pupils similar to cats (a vertical slit).

Blue Crab

Callinectes sapidus



TPWD PHOTO



The blue crab is the most common edible crab along the east coast of the United States and the Gulf of Mexico. Blue crabs, like shrimp, crayfish and lobsters, are members of the crustacean family.

Blue Crab

Callinectes sapidus



APPEARANCE

Width: *Carapace* (or shell) is about 7 inches (17.8 cm) wide and 4 inches (10.2 cm) long.

Weight: 1 to 2 pounds (0.45 to 0.9 kg)

Distinguishing Characteristics

- Hard-shelled back is dark brownish-green and is drawn out on each side into a large spine.
- Abdomen and lower legs are white.
- Claws are various shades of blue (hence their name), but the claw tips of the female are red.

LIFE HISTORY

Range: Estuaries along the east coasts of North and South America. Has also been seen in the coastal waters of France, Holland and Denmark.

Diet: Clams, oysters, and mussels, as well as almost any vegetable or animal matter, preferably freshly dead or freshly caught food—sometimes even young crabs

Predators: Red drum, Atlantic croaker, herons, sea turtles and humans

Sexual maturity: At 12 to 18 months

Mating: Females mate only once, immediately after they have *molted* (shed their shell) for the last time. Males mate often. When the females are in their soft-shell stage (immediately after molting), the males transfer their sperm to them for storage, and then protect them until their new shells harden. The females will spawn two to nine months after mating.

Eggs: Up to two million eggs

Spawning season: From December to October with a peak in spring and summer. When females are ready to spawn, they fertilize the eggs with the stored sperm and place them on the tiny hairs of the appendages on their abdomen. While carrying eggs like this, she is called a "sponge" or "berry" crab.

Incubation: 14 days

Young: The *megalops* (or larvae), pass through eight stages in about two months before they begin to look like crabs.

Perhaps only one or two crabs survive to become adults.

Life span: Up to three years

HABITAT

Blue crabs are bottom-dwellers in every type of habitat from the saltiest water of the gulf to the almost fresh water of the back bays and estuaries, from the low tide line to waters 120 feet (36 m) deep.

BEHAVIOR

After mating, the females travel to the saltier portions of the lower bays and gulf, while males remain in the estuaries. Blue crabs burrow in soft mud or hide in sea grasses to lie in wait for prey or avoid predators. Crabs are quite aggressive—perhaps inspiring us to refer to an aggressive or unpleasant person as a "crab!"

NOW YOU KNOW!

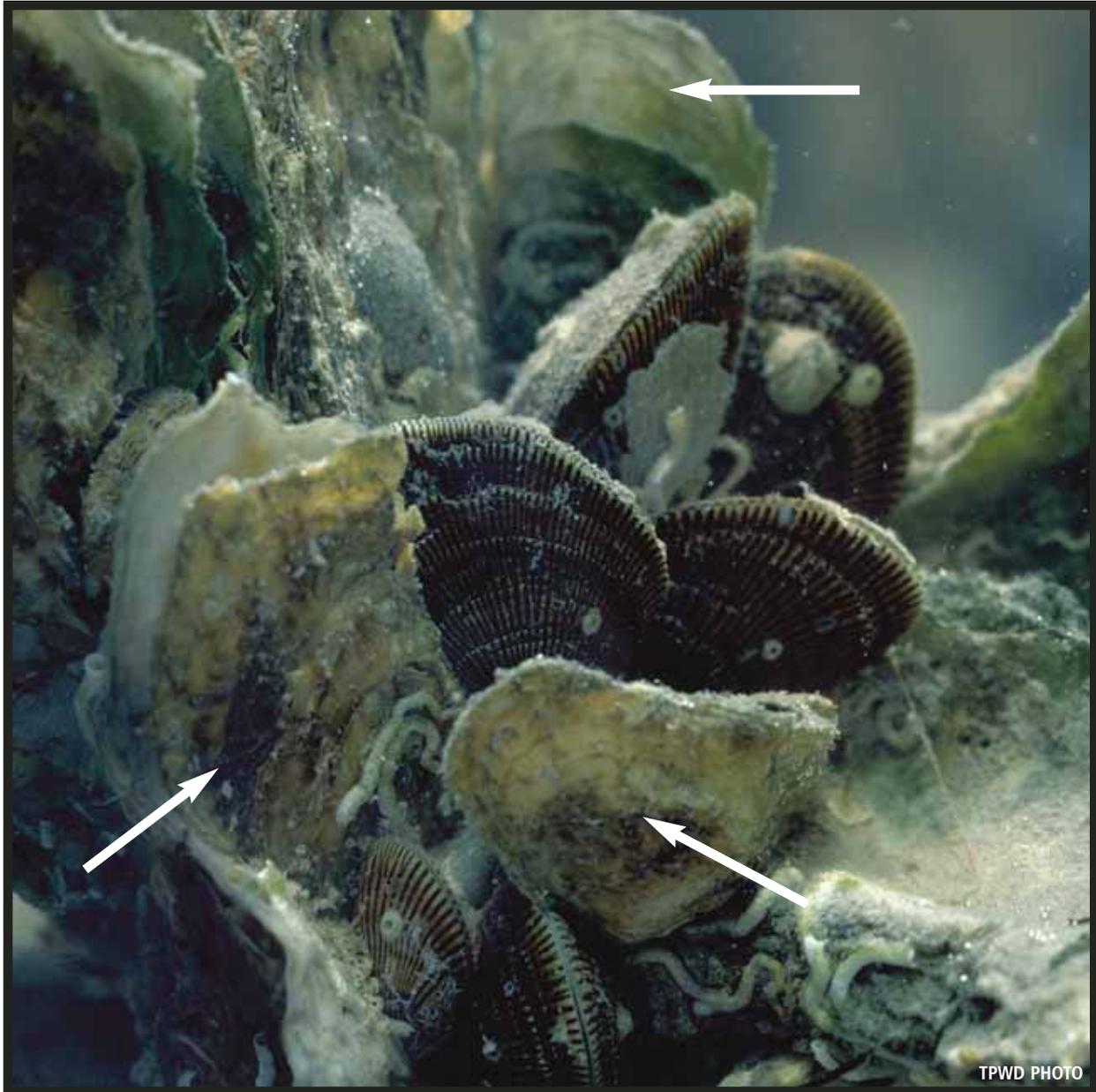
- Blue crabs suffer in low oxygen conditions. Pollutants from farms, sewage treatment plants, chemicals, homes and cars can have serious consequences for blue crabs.
- Parasites are common on crabs. Barnacles, worms and leeches attach themselves to the outer shell; small animals called *isopods* live in the gills or on the abdomen; and small worms live in the muscles. However, most of these parasites do not affect the life of the crab.
- Crabs can *regenerate* (regrow) pinchers or legs lost while fighting or protecting themselves. The lost limb will be replaced after two or more molts.
- The blue crab's scientific name, *Callinectes sapidus*, is from Latin and Greek: *calli*, beautiful; *nectes*, swimmer; and *sapidus*, savory—beautiful, savory swimmer.
- Like insects, blue crabs have stalked compound eyes and can see in almost every direction at once.

BLUE CRABS AND PEOPLE

Many people love to eat blue crab. The crabs are sold live to processors who boil, pick, and can the meat, to fish houses, and to supermarkets for sale over the counter. From 1977 to 1989, the yearly catch of blue crab ranged between 6.9 and 11.7 million pounds, and was valued between \$1,928,000 and \$4,474,000.

Eastern Oyster

Crassostrea virginica



The eastern oyster, also referred to as the American oyster or the Gulf Coast oyster, is one of the most sought-after coastal mollusks. Not only do people enjoy eating them, live oyster reefs help clean the water and provide habitat for all sorts of other animals such as sponges, small crabs, and fishes.

Eastern Oyster

Crassostrea virginica



APPEARANCE

Valve (shell) length: up to 8 inches (20 cm)

Distinguishing Characteristics

- Two shells (called “valves” hence the name *bivalve*) attach together at one end by a natural hinge and by a single large muscle.
- Pale white to gray shell
- Shell is rough with ridges or bumps.

LIFE HISTORY

Range: Ocean waters from Canada to Mexico

Diet: Plankton and algae

Predators: American oystercatcher, sea anemone, sea stars, sea nettles, some parasites and humans

Sexual maturity: About seven weeks after hatching

Spawning season: Late spring to early fall during warm weather

Eggs: Females may release more than 100 million eggs during a season. Only about one percent of the fertilized eggs reach the next stage of maturity.

Incubation: Within hours of mixing with sperm, the fertilized eggs develop a shell and begin to move on their own.

Larvae: Oyster larvae, each about the size of a grain of pepper, use tiny, probing feet to find a suitable place to attach. Once settled, the foot excretes a cement-like glue. The oyster glues itself in place and spends the rest of its life there.

Life span: Varies, depending on freshwater inflow and predators

HABITAT

Eastern oysters are abundant in shallow saltwater bays, lagoons and estuaries, in water 8 to 25 feet (2.5 to 7.5 m) deep and between 28 and 90 degrees F.

BEHAVIOR

Oysters are *protandric*—in the first year, they spawn as males, but as they grow larger and develop more energy reserves, they spawn as females. Oysters are also filter-feeders. They feed by using their gills to filter tiny food particles out of the water. Oysters have been found attached to bricks, boats, cans, tires, bottles, crabs, and turtles, but they prefer to attach to other oysters. When a large number of oysters join together, it’s called an “oyster reef.”

NOW YOU KNOW!

- Some oyster reefs are so large they are included on topographic maps. (In the eighteenth and nineteenth centuries, several oyster reefs were so big they posed navigational hazards to ships.)
- A purple stain or muscle “scar” is left on the inside of the shell when the *adductor* muscle (the muscle that holds the bivalve together) is removed.
- If the water gets too cold, below 40 degrees F, oysters close their shells and don’t open them again until the water warms up.

EASTERN OYSTERS AND PEOPLE

Oysters are one of the few animals eaten entirely raw, but they are more than just a popular seafood: oyster shells are used in calcium supplements and in industrial processes.

Because they are filter-feeders, oysters may ingest pollutants out of the water. The Texas Department of Health determines which areas are safe to collect oysters. If areas are too polluted, oysters become contaminated and unsafe to eat. The Texas Department of Health will then close the area(s) to oyster harvesting. Collecting or selling oysters taken from these closed areas is illegal.

Fiddler Crab

Uca rapax



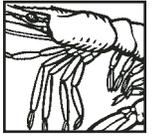
TPWD PHOTO



Fiddler crabs are the most common crab in a salt marsh and they play an important role in the salt marsh community. They eat *detritus* (dead or decomposing plant and animal matter) and are themselves food for a number of wetland animals.

Fiddler Crab

Uca rapax



APPEARANCE

Carapace (shell) length: 1 to 2 inches (2.5 to 5 cm)

Distinguishing Characteristics

- Dark during the day; a lighter color at night
- Males have one large claw and one small claw.
- Females' claws are the same size.
- Move sideways rather than forward or backward

LIFE HISTORY

Range: Gulf of Mexico to South America

Diet: Algae, bacteria, fungus scraped off of sand particles and *detritus* (dead and decaying plant and animal matter)

Predators: Herons, egrets and raccoons

Sexual maturity: At one to two years

Spawning season: June through August

Incubation: 14 days

Life span: Up to 1.5 years

HABITAT

Fiddler crabs are most often found in soft sand or mud near or around the edges of shallow salt marshes.

BEHAVIOR

Fiddlers have a remarkable mating ritual: male fiddlers line up beside the tidy burrows they have dug and move their *chelipeds* (large claws) back and forth in a fiddling motion to attract females. Females, fresh from foraging, will walk past and if a male catches a female's eye, he will tap the ground with his claw. If she is still receptive to his advances, she will

enter his burrow. They mate inside the burrow and she emerges two weeks later to release her *sponge* (fertilized eggs) into the water.

The burrows provide privacy for mating, sleeping and "hibernating" during the winter months. Fiddlers also burrow into the sand to escape from predators and abandon their temporary burrow once the danger has passed. During high tide, fiddler crabs pack sand into the entrance to their burrows and wait until the tides goes down again.

NOW YOU KNOW!

- Fiddler crabs reabsorb their shells rather than shed their shells in order to grow a larger, better-fitting one.
- Fiddlers use their claws to pick up sediment and scrape food particles into their mouths. The males can only use their single small claw for feeding so they have to work twice as hard as the females do to get the same nutrients.
- If one claw is lost, the fiddler crab will soon *regenerate* (regrow) a new one. In the meantime, the claw that is left will grow bigger.
- These crabs are seen year-round in Texas salt marshes and are always moving sideways.
- Sand or mud pellets "sprinkled" around the opening of a crab burrow means that a crab currently lives there.

FIDDLER CRABS AND PEOPLE

In Spanish, the fiddler crab is called a *cangrejo violinista*, which literally translates to "violinist crab." Fiddler crabs help preserve our important coastal wetland ecosystems. By burrowing deep into the mud of the marshes, the crabs create a maze of tunnels that *aerate* (add oxygen to) the marsh grasses and underwater seagrass meadows.

American Oystercatcher

Haematopus palliatus



The American oystercatcher is an easily recognized shorebird that makes its home on the beach or near salt marshes and mudflats. The bird's long orange bill is shaped like a knife. It uses its beak to pry open oysters and other bivalves for food, hence the name "oystercatcher."

COASTAL WETLANDS

American Oystercatcher

Haematopus palliatus



APPEARANCE

Height: 17 to 21 inches (43 to 53 cm)

Wingspan: 35 inches (89 cm)

Distinguishing Characteristics

- Orange bill 3 to 4 inches (7.5 to 10 cm) long
- Thick pink legs
- Bright yellow eyes with red rings around them
- Black or dark brown backs with black heads and necks
- White bellies and breasts and white stripes on their wings

LIFE HISTORY

Range: Along the Atlantic and Gulf coasts of North America and south along the Pacific Coast of South America

Diet: Oysters, clams, barnacles, starfish, crabs, jellyfish, limpets, chitons, marine worms and other invertebrates

Predators: Large *raptors* (birds of prey); raccoons and skunks prey on the eggs

Sexual maturity: At one year

Mating season: February through July

Nests: Shallow depressions scraped into higher parts of sandy or rocky beaches above the high tide line.

Eggs: Two to four buff-colored eggs with light and dark brown spots and other marks about 2 by 1.5 inches (5 by 3.8 cm)

Young: The chicks can run within 24 hours of hatching, but it takes up to 60 days for their beaks to become strong enough to pry open their own bivalves. The young birds may remain with their parents for up to six months.

Life span: Ten years or longer

HABITAT

American oystercatchers prefer rocky, sandy or shell beaches, salt marshes and mudflats.

BEHAVIOR

Oystercatchers are very protective of their young. Both parents incubate the eggs. To disguise the speckled eggs, the adults add broken shells or pebbles to the nests. To distract predators, adult birds will fake an injury to attract attention away from the nest or pretend to brood where there is no nest. Oystercatchers sometimes give such extensive care to their young that the adults starve.

NOW YOU KNOW!

- When an American oystercatcher pries an oyster shell open, it quickly clips the bivalve's *adductor muscle* (the muscle that holds its shell shut). The bivalve cannot protect itself and is eaten by its predator.
- Oystercatchers that feed mainly on animals in the soft sand or mud have a more pointed bill than oystercatchers that feed on rocky shorelines.
- The black oystercatcher (*Haematopus bachmani*), the American oystercatcher's cousin, is *endemic to* (or found only on) North America's Pacific Coast.
- Because they live and feed on the seashore, salt builds up in oystercatchers' blood from the salty water. Special glands help the birds drain excess salt out of their system.

AMERICAN OYSTERCATCHERS AND PEOPLE

The genus name *Haematopus* is Greek for "blood foot," and refers to the oystercatcher's pink legs. *Palliatus* means "cloaked" in Latin, and refers to the black "cloak" of feathers on its head.

During the eighteenth and nineteenth centuries, American oystercatchers were hunted for food and their plumage. When the species became protected under law in 1918, it was near extinction along the Atlantic Coast. Its numbers are now increasing throughout its range. However, as cities and towns grow along beaches in North America, oystercatchers have fewer available nesting areas.

Atlantic Bay Scallop

Argopecten irradians amplicostatus



As filter-feeders, bay scallops play an important role in keeping the waters clear and clean. When caught, they can be cooked and eaten, provided they were collected in areas considered "non-contaminated" by the Texas Department of Health.

COASTAL WETLANDS

Atlantic Bay Scallop

Argopecten irradians amplicostatus



APPEARANCE

Valve length: 2.5 to 2.8 inches (60 to 70 mm)

Distinguishing Characteristics

- Nearly identical fan-shaped shells with 17 to 20 ribs on each shell
- Shell color varies

LIFE HISTORY

Range: Galveston, Texas down to the Laguna Madre along the Texas Gulf Coast

Diet: Absorbs and ingests floating *detritus* (dead and decomposing plant and animal matter)

Predators: Starfish, wading birds, seagulls, pinfish, lightning whelks, cow-nosed rays, crabs and humans

Sexual maturity: At one year

Spawning season: Between August and October

Eggs: 100,000 to 1 million eggs

Young: Within 29 days the juvenile stage is reached. Within 35 days the scallop resembles a small adult.

Life span: Less than two years

HABITAT

Atlantic bay scallops prefer bays where salinity is high and seagrass meadows are common, especially habitat covered with eel grass (*Zostera marina*) and/or shoal grass (*Halodule wrightii*). They are most commonly found in calm waters 0.3 to 0.6 meters at low tide.

BEHAVIOR

As juveniles, scallops will attach themselves to a surface suspended off the bottom with special adhesive threads called *byssal threads*. As adults, scallops move from one place to another by quickly “clapping” their valves together and ejecting water, creating a type of “jet propulsion.” Sometimes scallops migrate in mass.

NOW YOU KNOW!

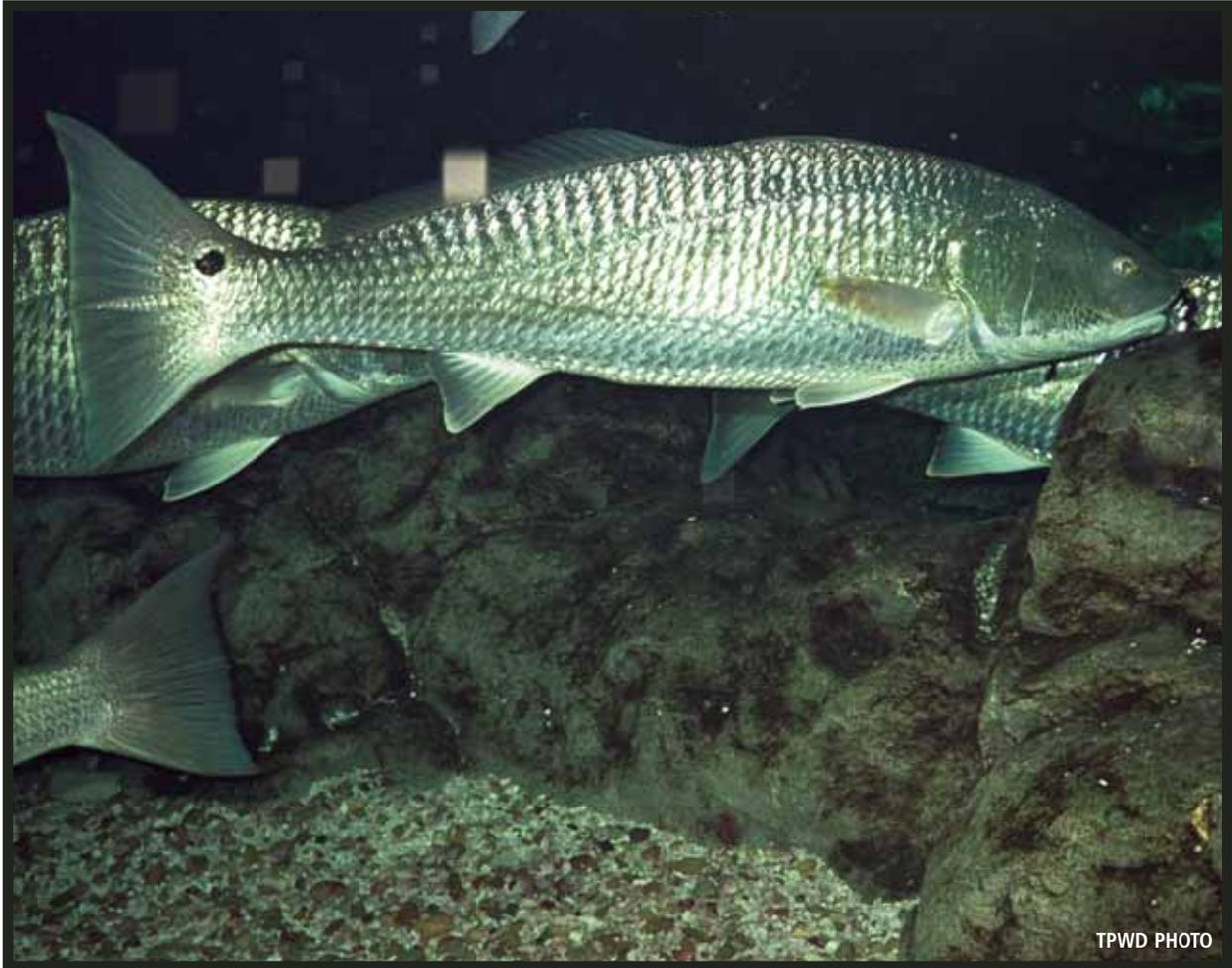
- Scallops are *hermaphrodites* (can be both male and female). A single scallop will generally release sperm (as a male) before it releases eggs (as a female). This reduces the chance of it fertilizing itself.
- Natural occurrences such as *red tide* (a harmful algal bloom) can kill millions of adult and larval bay scallops.
- Scallops grow at a faster rate during the warmer months when food is readily available.
- Scallops have a series of blue eyes around the *mantle* (the tissue that secretes the shell). Although they are weak, the eyes help scallops identify predators.

ATLANTIC BAY SCALLOPS AND PEOPLE

The destruction of seagrass areas as a result of dredging and development has resulted in the decreased abundance of the bay scallop. This tasty seafood is collected by hand, with dip nets, by raking and dredging. Scallops can only be harvested from areas approved by the Texas Department of Health—Seafood Safety. Because they are filter-feeders, Atlantic bay scallops are studied to test the effects of petroleum spills in coastal habitats.

Red Drum

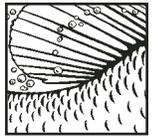
Sciaenops ocellatus



The red drum is a popular game fish in coastal waters from Massachusetts to Mexico. It is easily recognized by the black spot on its tail.

Red Drum

Sciaenops ocellatus



APPEARANCE

Length: 11 inches (28 cm) at one year

Weight: 1 pound (.45 kg) at one year

Distinguishing Characteristics

- Deep copper (nearly black) to reddish-bronze, and sometimes almost silver
- Lighter-colored in clear waters
- Dark spot on the upper part of their tail

LIFE HISTORY

Range: From Massachusetts to Key West, Florida, and along the Gulf Coast to Tuxpan, Mexico

Diet: Young fish feed on small crabs, shrimp and marine worms. As they grow older, they feed on larger crabs, shrimp, small fish and sometimes their cousins, the Atlantic croaker.

Predators: Humans, birds, larger fish and turtles

Sexual maturity: Between the third and fourth year

Spawning season: Mid-August through mid-October in Gulf waters, near the mouths of passes and shorelines

Incubation: 24 hours

Young: Larvae are carried into tidal bays by the current. They move to quiet, shallow water with grassy or muddy bottoms to feed on *detritus* (dead or decomposing plant and animal matter).

Life span: Oldest recorded was 37 years.

HABITAT

Red drum are most abundant in water 1 to 4 feet (30 cm to 1.2 m) deep with submerged vegetation such as seagrasses. They prefer soft mud along jetties, pier pilings and jetties.

BEHAVIOR

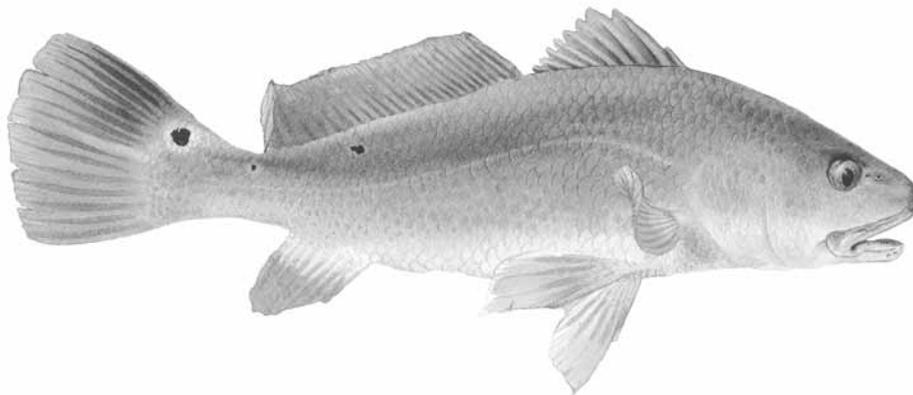
During spawning, red drum males attract females by producing a drum-like noise by vibrating a muscle in their swim bladder. During the fall, especially during stormy weather, large adult males move toward very shallow water along beaches in what anglers call the "bull redfish run." They sometimes swim in water so shallow that their backs are exposed.

NOW YOU KNOW!

- Red drum are related to black drum, spotted seatrout, weakfish, mullets and croakers, most of which also make drumming sounds.
- Scientists believe that the black spot near their tail helps fool predators into attacking the red drum's tail instead of their head, allowing the red drum to escape.

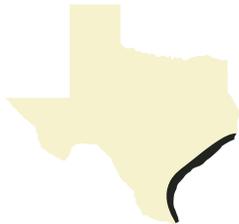
RED DRUM AND PEOPLE

Red drum is considered a great sport fish because it will hit on most kinds of bait. The Texas record for a red drum catch was 51.5 pounds (23 kg); however, a red drum weighing 94 pounds (42.69 kg) was caught along the North Carolina coast.



Pinfish

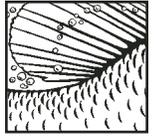
Lagodon rhomboides



The jewel tones and abundance of the pinfish make it a welcome and familiar sight in the coastal waters of Texas.

Pinfish

Lagodon rhomboides



APPEARANCE

Length: Adults around 4.5 inches (11.43 cm)

Distinguishing Characteristics

- Back olive, sides bluish with yellow stripes and five to six faint dusky bars
- Silvery sheen overall
- Dark spot on shoulder
- Fins yellow

LIFE HISTORY

Range: In coastal waters from Cape Cod, Massachusetts south through the Gulf of Mexico and the north coast of Cuba to the Yucatan peninsula

Diet: Juveniles eat shrimp, fish eggs, insect larvae, polychaete worms and amphipods. Adults eat all of those plus plant material.

Predators: Alligator gar, longnose gar, ladyfish, spotted seatrout, red drum, southern flounder and bottlenose dolphin

Sexual maturity: About one year when the fish has reached 80 to 100 mm in length

Spawning season: Takes place in the fall and winter with eggs that are broadcast in the water by the female, then fertilized by the male

Eggs: Number of eggs varies; approximately 7,000 to 90,000 that hatch after 48 hours

Young: Not protected by adults; larval stage until they reach about 12 mm in length, then juvenile stage until they reach 80 mm

Life span: Because they are eaten by many other species, the life span is generally short.

HABITAT

Adult pinfish prefer protected waters of the Gulf between 30 and 50 feet deep, while juveniles are common over seagrass beds or other structure such as rocky bottoms, jetties, pilings, and in mangrove areas where there is cover from predators. They prefer water that has a higher salinity.

BEHAVIOR

Pinfish rarely *school* (swim in groups) and are most active in daytime, although some nocturnal activity has been observed. Extremely high and low temperatures cause pinfish to migrate from shallow areas to deeper areas. Adults and juveniles migrate out of the shallower waters in the fall to their spawning grounds in the deeper waters of the Gulf.

NOW YOU KNOW!

- Pinfish are so abundant and eat so many amphipods, that they are an important limiting factor to amphipod populations, keeping them in balance within the seagrass community.
- Pinfish are also called bream, pin perch, sand perch and butterfish.

PINFISH AND PEOPLE

Although they have a good flavor, pinfish are rarely eaten because they are relatively small fish. Still, pinfish are a favorite among young anglers because they are fun to catch. Also, pinfish are a main prey item of larger fish that are prized by anglers, providing an important link in the food chain. Scientists have also used pinfish extensively to test the toxicity of hydrocarbons to determine the effects oil spills might have on marine life.

Long-billed Curlew

Numenius americanus



Not surprisingly, the long-billed curlew has a long, downward curving bill. Look for it on the seashore where it spends its winters or in fields and prairies where it breeds. Habitat loss has forced it to exist almost exclusively in the western half of North America.

COASTAL WETLANDS

Long-billed Curlew

Numenius americanus



APPEARANCE

Height: 18 to 26 inches (45 to 66 cm)

Wingspan: 36 to 40 inches (91 to 101 cm)

Distinguishing Characteristics

- Speckled brown and buff backs and upper wings, buff-colored bellies and breasts and cinnamon-colored underwings
- Legs and feet are bluish-gray.
- Long, thin, down-curved bill is dark and fades to a flesh tone at the base; it can be more than 8 inches (20 cm) long and has a droplet-shaped tip.
- Webbed front toes

LIFE HISTORY

Range: Southwestern Canada to the western half of the United States. They winter in the southern United States and south to Guatemala, but can be found along the Texas Gulf Coast during the summer as well.

Diet: When inland, mostly insects and worms. In coastal areas, they probe in the mud with their long bills for shellfish, crabs and fish. They will also eat other nesting birds.

Predators: Hawks, badgers, coyotes, weasels and snakes

Sexual maturity: At three to four years

Mating season: Mid-April through September

Nests: Built on the ground in flat, open areas with clumps of grass. The nests are simple depressions in the ground, usually lined with grass.

Eggs: Four greenish or buff-colored, pear-shaped eggs with brown spots

Incubation: 27 to 30 days

Young: The chicks can fly within 45 days of hatching.

Life span: Up to ten years

HABITAT

Long-billed curlews prefer prairies and pastures with short grass during breeding season. After breeding, they seek seashores, lakes, rivers, mudflats and salt marshes.

BEHAVIOR

Curlews frequently build nests near cow patties or bushes to help hide the nests from predators. The females incubate the eggs during the day and the males incubate at night. The females will abandon the nest and their mate two to three weeks after the eggs hatch. Predators destroy 10 to 16 percent of long-billed curlew nests. If a nest is only partially destroyed, the parents will still abandon the remaining eggs.

NOW YOU KNOW!

- Long-billed curlews are also called "sicklebills," "big curlews" or "hen curlews."
- The genus name, *Numenius*, is Greek and refers to its crescent-shaped bill.
- Long-billed curlews can swim if they need to—their front toes are webbed.
- They can fly as fast as 50 miles (80 km) per hour.

LONG-BILLED CURLEWS AND PEOPLE

The long-billed curlew was once common along the Great Plains and in the eastern United States. In the late 1800s and early 1900s, these and other shorebirds were hunted in large numbers as game; long-billed curlew was a menu item in many restaurants. By the time they were finally protected by the Migratory Bird Treaty Act, much of their crucial breeding habitat had been destroyed for agriculture. Populations in the eastern United States never recovered, but curlews remain fairly common in the western United States. Although pesticides may have also contributed to declining populations of curlews, the main reason for the species' continued decline is habitat loss. The long-billed curlew is listed on the Audubon Society's Blue List of decreasing bird populations. It is also listed as endangered, threatened, or species of special concern in several states.

Northern Harrier

Circus cyaneus



The northern harrier, also known in North America as the marsh hawk, is a bird of prey that is common in Texas during the winter months. It preys on small rodents, reptiles, and amphibians. It is the only species of harrier found in North America.

Northern Harrier

Circus cyaneus



APPEARANCE

Height: Males: 16 to 18 inches (40 to 45 cm)

Females: 20 inches (50 cm)

Wingspan: 3 feet (0.9 m); females: 4 feet (1.2 m)

Distinguishing Characteristics

- Males: bluish-gray backs, white undersides and black wing-tips
- Females: brown backs and cream-colored bellies and breasts with dark brown streaks
- White rumps, yellow eyes, yellow legs and a yellow *cere*, the leathery patch of skin where the nostrils are located
- Like other hawk-like birds, they have a sharp, down-turned beak and long sharp talons.
- When gliding, harriers sometimes hold their wings in a *dihedral* or "V" shape.

LIFE HISTORY

Range: From central Canada south to Texas. They migrate southward in the winter, and may be found throughout all of Texas between September and May.

Diet: Small rodents (mice and voles), amphibians, small reptiles, small rabbits, other birds, as well as some invertebrates

Predators: Striped skunk and raccoons (on eggs), red fox, feral cats and other birds

Sexual maturity: At one year

Mating season: March through June

Nesting: Nests are built on the ground or on a mound of dirt or vegetation. They are made of sticks and are lined inside with grass and leaves. The nests are usually 15 to 30 inches (38 to 76 cm) in diameter.

Eggs: Four to eight eggs are laid over several days. The eggs are bluish-white and usually unmarked.

Incubation: Between 24 to 39 days

Young: The young birds may leave the nest 30 days after they hatched.

Life span: 12 years

HABITAT

The northern harrier prefers coastal prairies, marshes, grasslands, swamps and other open areas.

BEHAVIOR

Northern harriers hunt by flying low to the ground in open areas. Harriers circle an area several times listening and looking for prey. When they spot prey, they swoop down and grab the prey with their sharp claws. These are the only hawk-like bird known to practice *polygyny*—one male mates with several females. When incubating eggs, the female sits on the nest while the male hunts and brings food to her and the chicks.

NOW YOU KNOW!

- The genus name, *Circus*, comes from the Greek word *kirkos* and describes the bird's habit of flying in low circles while hunting; *cyaneus* refers to their blue-gray color.
- Northern harriers can fly more than 100 miles (161 km) every day.
- Harriers and other hawk-like birds can see eight times more clearly than humans.
- Since they nest on the ground, their nests are in danger of being trampled by cattle and deer and are unprotected from fires.
- They depend heavily on hearing while hunting; the ruffled feathers around their faces help direct sound towards their ears.

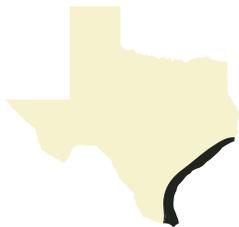
NORTHERN HARRIERS AND PEOPLE

Once upon a time, in some parts of Europe people believed that seeing a harrier perched on a house was a sign that three people would die; on a happier note, some Native American tribes believe that seeing a hawk on your wedding day is a sign of a long, happy marriage.

Many farmers like northern harriers because they eat predators of quail eggs and mice that damage crops. Harriers are sometimes called "good hawks" because they pose no threat to poultry as some hawks do. Heavy pesticide use in the 1970s and 1980s caused a decline in harrier populations.

Black-necked Stilt

Himantopus mexicanus



The black-necked stilt wades in shallow water to catch food. It is widely distributed along the Atlantic and Pacific coasts of the United States and is a common summer resident of the Gulf Coast region.

COASTAL WETLANDS

Black-necked Stilt

Himantopus mexicanus



APPEARANCE

Height: 13 to 17 inches (33 to 43 cm)

Wingspan: About 27 inches (68 cm)

Distinguishing Characteristics

- Adult males have black backs, white bellies, black bills and long red or pinkish legs.
- Adult females look the same as males, but have brownish backs.
- Long, pointed black wings
- Slender bill curves slightly upward.

LIFE HISTORY

Range: Along Atlantic and Pacific coasts as well as the Gulf Coast. Sometimes in inland states such as Idaho, Kansas, or in the Rocky Mountains. Winters in Brazil, Peru, the West Indies, and southern parts of the Pacific and Atlantic coasts. Summers on the Gulf Coast.

Diet: Worms, mollusks, shrimp, insects, small fish and sometimes floating seeds

Predators: Foxes, gulls, skunks, coyotes and other birds

Sexual maturity: At one year

Mating season: April through August

Nests: Built on the ground near water. Made of sticks, mud, or shells, or scrapes in the ground. May be lined with grass, twigs, and shells. Measure 6 to 10 inches (15 to 25 cm) in diameter.

Eggs: Three or four eggs that are tan-colored with dark brown or black irregular spots

Incubation: 22 to 26 days

Young: Chicks are able to run, walk and swim as soon as their down is dry, which is usually within 24 hours of hatching.

Life span: Approximately 20 years

HABITAT

Black-necked stilts prefer marshes, mudflats, flooded fields, ponds and drainage ditches where food is abundant.

BEHAVIOR

Black-necked stilts may arrange their nests in small colonies of six to ten nests. Although parents share nest-tending through the incubation period, males will often mob intruders and will even try to chase people away. After the chicks hatch, the parents will remove all eggshells from the nest, probably to better camouflage the nest. At night, chicks will hide from predators in the water, inhibiting predators from seeing them or *smelling* them.

NOW YOU KNOW!

- Black-necked stilts are also called daddy longlegs, stilts and longshanks.
- Stilts' legs are longer in proportion to their bodies than any other bird except the flamingo.
- Stilts belong to the family Recurvirostridae which, in Latin, means "bent bill."
- Black-necked stilts have partially webbed feet, which allow them to swim—but they rarely do.

BLACK-NECKED STILTS AND PEOPLE

Because they will use man-made structures such as drainage ditches and sewage ponds for habitat, the range of black-necked stilts is expanding.

Stone Crab

Menippe mercenaria

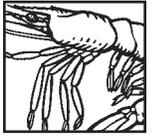


Stone crabs have huge, tan, black-tipped claws. These bulky claws are strong enough to crush an oyster shell, and make these crabs valuable for their meat.

COASTAL WETLANDS

Stone Crab

Menippe mercenaria



APPEARANCE

Carapace (shell) length: 3 to 3.5 inches (7.6 to 8.9 cm) long and about 4 inches (10 cm) wide

Distinguishing Characteristics

- Brownish red with gray spots and tan underneath
- Large and unequally-sized pincers tan with black tips
- Females have a larger *carapace* (the top outer shell), but males usually have larger claws than females.

LIFE HISTORY

Range: Along the Gulf Coast

Diet: Oysters and other small mollusks, polychaete worms and other crustaceans.

They will also occasionally eat seagrass and *carrion* (remains of dead animals).

Predators: Horse conch, grouper, sea turtles, cobia, octopi and humans

Sexual maturity: At one year

Spawning season: All spring and summer

Eggs: 500,000 to 1 million

Young: The larvae go through six stages in about 36 days before emerging as juvenile stone crabs.

Life span: Seven to eight years

HABITAT

Stone crabs prefer bottoms of bays, oyster reefs and rock jetties where they can burrow or find refuge from predators. Juveniles do not usually dig burrows, but instead hide among rocks or in seagrass beds.

BEHAVIOR

The male stone crab must wait for the female to shed her exoskeleton before they can mate. After mating, the male will stay to help protect the female for several hours to several days. The female will spawn four to six times each season. Adult stone crabs make burrows in mud or sand below the low tide line, lying in wait for prey.

NOW YOU KNOW!

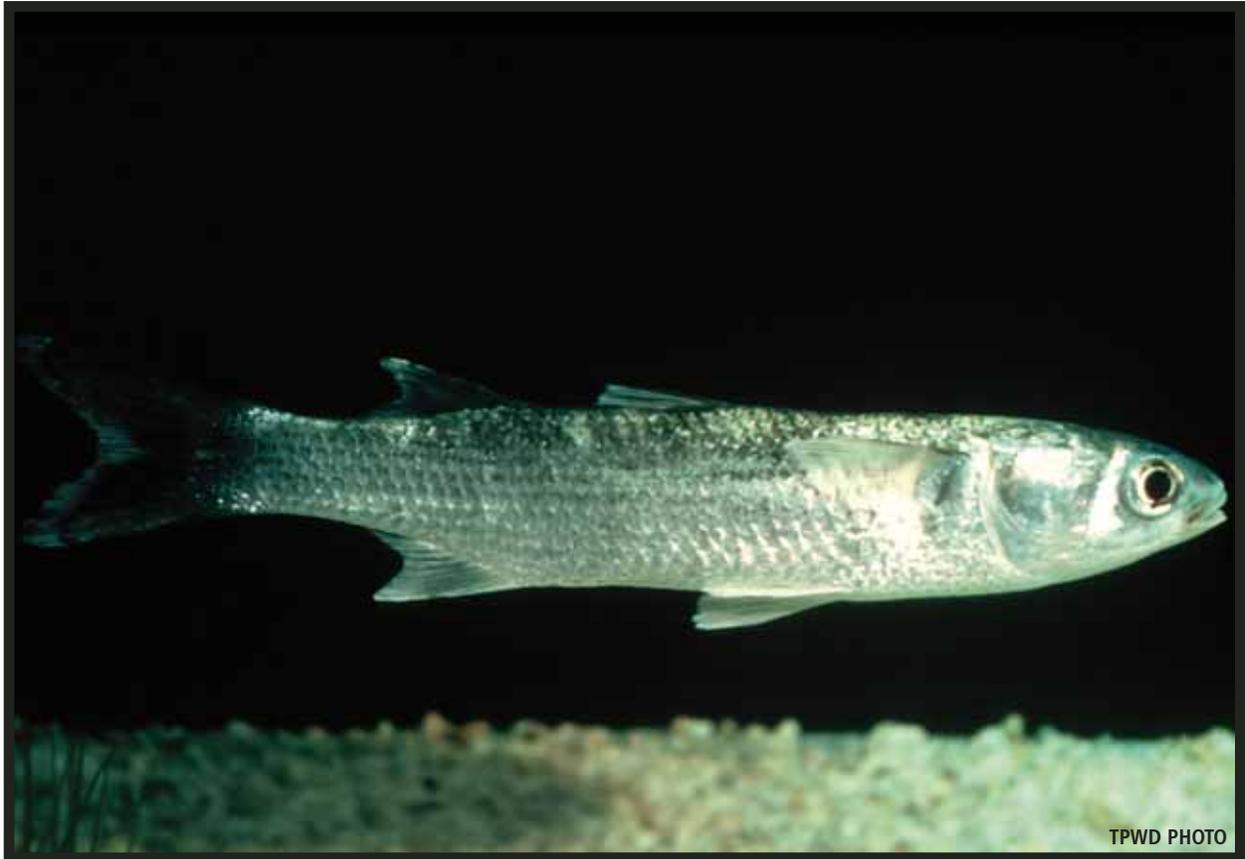
- The stone crab loses its limbs easily to escape from predators or tight spaces, but their limbs will grow back. When a claw is broken in the right place, the wound will quickly heal itself and very little blood is lost. If, however, the claw is broken in the wrong place, more blood is lost and the crab's chances of survival are much lower. It only takes about one year for the claw to grow back to its normal size. Each time the crab molts its exoskeleton, the new claw grows larger.
- The larger of the two claws is called the "crusher claw." The smaller claw is called the "pincer claw." If the larger crusher claw is on the right side of the crab's body, the crab is "right handed." If the crusher claw is on the left side of the crab's body, it is "left handed."
- Since crabs' eyes are on stalks, they can see 360°.
- A large crab claw can weigh up to half a pound.

STONE CRABS AND PEOPLE

Many people prefer to eat stone crab claws instead of blue crab claws. The stone crab's meat is supposed to taste like lobster. Because their claws can be regenerated, most states require that only one claw be removed and the crab be returned to the water. This way, over-harvesting of the species is prevented.

Striped Mullet

Mugil cephalus

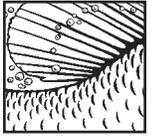


Striped mullet can often be seen in coastal waters, jumping to evade predators. Because they are one of the most common prey items of other commercially important coastal fish such as spotted seatrout, people often use them as bait.

COASTAL WETLANDS

Striped Mullet

Mugil cephalus



APPEARANCE

Length: Adults: 9 to 19.5 inches (35 to 50 cm)

Immature: 3 to 8 inches (7.6 to 17.8 cm)

Distinguishing Characteristics

- Irregularly round, silvery body
- Dark bluish green back and dark longitudinal stripes on the sides
- Small mouth

LIFE HISTORY

Range: Worldwide in warm to temperate coastal waters

Diet: Zooplankton, benthic (bottom-dwelling) organisms and *detritus* (dead plants and animals), and small invertebrates

Predators: Larger fish, turtles, water snakes and wading birds

Sexual maturity: Three years

Mating season: Late October to December for Texas species; mature adults leave bays, collect in large schools and migrate offshore to mate

Eggs: One to seven million round eggs scattered on the bottom; not guarded by adults

Incubation: 36 to 38 hours at 24° C and 48 to 50 hours at 22° C

Young: Of millions of eggs spawned in offshore waters, most are eaten by other species. Juveniles return to coastal locations to mature after they have reached 15 to 32 mm long.

Life span: Seven years for males; eight years for females, with a probable average life span of five years

HABITAT

Striped mullet are found in highly salty to fresh waters that are warm or temperate (8° to 24° C). They spend a great deal of time close to shore around the mouths of streams and rivers or in brackish bays, inlets and lagoons with sand or mud bottoms.

BEHAVIOR

Striped mullet tend to *school* (swim together in groups) for protection from predators in the daylight hours, although they feed around the clock.

NOW YOU KNOW!

- The oldest striped mullet on record is one that lived 13 years.
- Florida, Georgia, Mississippi, and Alabama harvest many tons of mullet for commercial use.
- The roe (eggs) are harvested and shipped to markets in Asia where they are considered a delicacy.

STRIPED MULLET AND PEOPLE

In Florida, striped mullet can be found on the menus of many restaurants, but in the western Gulf of Mexico (Texas and Louisiana waters), they take on an oily taste and are generally not eaten. Instead, mullet are harvested for use as a bait fish. Striped mullet are also widely cultivated in freshwater ponds in Southeast Asia where they are marketed fresh, dried, salted, and frozen. They are a very important commercial species in many parts of the world.

Seagrass

Submerged Aquatic Vegetation

Shoalgrass

Halodule wrightii



PHOTO BY WARREN PULICH

Turtlegrass

Thalassia testudinum



PHOTO BY KEN DUNTON



Shoalgrass, widgeongrass, and turtlegrass are seagrasses that occur in Texas' clear, shallow estuaries. Seagrasses are considered an *indicator* species—they provide clues to the health of the entire bay-estuarine system.

Seagrass

Submerged Aquatic Vegetation



SHOALGRASS

Halodule wrightii

LEAF

1/16 inch (1.5 mm) wide leaves

HABITAT

Grows in high-salinity waters of all bays south from East Matagorda Bay. Especially abundant in the Upper Laguna Madre. Declining in the Lower Laguna Madre and in West Galveston Bay.

WIDGEONGRASS

Ruppia maritima

LEAF

Very narrow with pointed tips. Also produces yellow flowers. Often, branched shoots at a node.

HABITAT

Abundant in low-salinity waters of all upper bay areas along the Texas coast. Often occurs in spring, growing with shoal-grass. Also, commonly occurs in brackish (salt/fresh) ponds near the coast.

TURTLEGRASS

Thalassia testudinum

LEAF

1/4 to 1/2 inch (6.3 to 12.6 mm) wide, flat leaves

HABITAT

Occurs in deeper waters of high salinities in Aransas, Redfish, Corpus Christi Bays and the Lower Laguna Madre. It is the dominant seagrass in the Laguna Madre. It is a slow grower and takes time to recover from any disturbance or stress.

NOW YOU KNOW!

- More than 90% of the seagrass beds in Galveston Bay have been lost because of storms, hurricanes, disease, plankton-blooms and development.
- About 80% of Texas' existing seagrass habitat is located in the Laguna Madre.
- Not surprisingly, widgeongrass is the food of choice for a large variety of ducks and sea turtles; fish and invertebrates eat turtlegrass.
- Seagrasses are not true grasses. They are actually highly specialized flowering plants.

SEAGRASSES AND THE ECOSYSTEM

Seagrass beds provide important habitat and are important contributors to the estuarine food chain. Their decomposing leaves provide nutrients for larval and juvenile shrimp, crabs and fish. Their leaves also provide protective cover for these species. Seagrass beds are great places to find spotted seatrout and red-fish. Waterfowl, such as redhead ducks, feed on seagrass leaves and roots. Seagrass roots bind the soil together and help reduce erosion.

SEAGRASSES AND PEOPLE

Dredging, boat propellers and high currents stir water and raise sediments making it difficult for sunlight to reach the seagrasses and preventing *photosynthesis*. Without sunlight, the seagrasses will die.

Seagrass habitats are wonderful areas for teachers to use as "outdoor classrooms!"