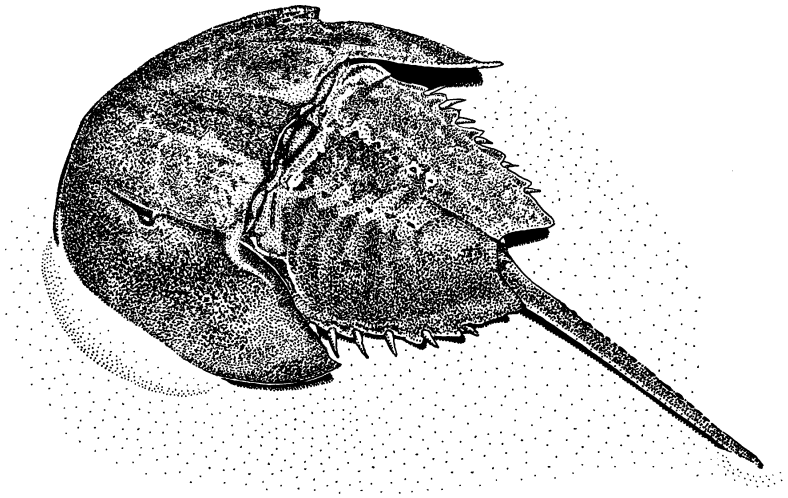
North Carolina WILD



Atlantic Horseshoe Crab

Limulus polyphemus

Horseshoe crabs are one of nature's oldest and most unusual creatures. As they scuttle along the sandy bottoms of estuaries and sounds, these bulky brown arthropods look like armored troops headed for battle. Shaped like a horseshoe, their hard shield, or carapace, gives them their name. But horseshoe crabs aren't crabs at all, as they are more closely related to spiders and scorpions than crustaceans.

History and Status

People often call horseshoe crabs "living fossils" because they have survived for millions of years. The genus, *Limulus*, first appeared during the Triassic period 180 million to 220 million years ago. Many of its relatives have become extinct, but the horseshoe crab remains essentially unchanged. A stable living environment provided by the estuary contributes to this constancy.

Five species of horseshoe crabs survive. The common Atlantic horseshoe crab lives along the eastern North American coast. During the 19th and 20th centuries, extensive collecting of these crabs for use in fertilizers and pig and chicken feed led to huge population declines.

Related species live along Asian coasts from Japan and the Philippines to India, and they have reached an endangered status in Japan in the past.

Description

The Atlantic horseshoe crab bears a greenish brown shell and can grow to about 2 feet long and weigh 4 or 5 pounds. Its tough exoskeleton is smooth and convex, helping to protect its appendages and push it through the water. Males and females cannot easily be distinguished, but females typically grow larger.

A horseshoe crab's body is divided into two parts: a forepart and a hind part. The semicircular cephalothorax, or prosoma, consists of a fused head and thorax. On its upper side, two large compound eyes enable the horseshoe crab to see fairly well. A pair of simple eyes, which detect day length, appear near the tip of the carapace.

Behind a flexible joint lies the abdomen, or opisthosoma, with fused plates creating the shell-like covering. A long, spikelike tail called a telson extends from the abdomen and can grow up to a foot long. Small protective spines jut from the side of the abdomen.

Turn over a horseshoe crab to see six pairs of appendages. The first two pairs make up the mouthparts; the others are walking legs.

Six pairs of flap-like appendages lie underneath the abdomen. The first two pairs act as covers for the genital pores, where sperm or eggs are released. The others cover book gills, thin plates in which blood circulates.

Habitat and Habits

These ancient marine invertebrates prefer shallow waters with sandy or muddy bottoms. Most active at night, they work like scavengers, seizing food as they burrow in the sand. Primarily they feed on small bivalves, but they also eat marine worms, seaweeds and other available foods such as dead fish. They seize their prey with all but their last pair of appendages. Often, they use the first pair—tiny pinchers called chelicerae—to pick up prey and pass it to the base of the walking legs. Here, coarse spines grind the food then move it into a small, centrally located mouth. Unlike other arthropods, horseshoe crabs do not have jaws but "chew" their food, instead, with these bristly spines.

Slow-moving horseshoe crabs usually walk on the bottom, but they can swim clumsily on their backs using their gills as paddles. If horseshoe crabs settle to the bottom on their backs, they use

Range Map:
Occupied range

their tails as a lever to turn over.

The tail and spines offer protection, as well as the tough outer shell. Yet young horseshoe crabs fall prey to large crabs and fish such as speckled trout or flounder. Humans and sharks remain the adults' greatest predators.

Atlantic horseshoe crabs spawn in spring and early summer. They spawn in large groups, rising to the intertidal zone to lay their eggs at or near the high-water mark.

Unlike other arthropods, horseshoe crabs fertilize their eggs externally. The male clasps on to the female's back, then they crawl across the sand to a protected and moist site. The female scoops sand with brushlike bristles on her last pair of walking legs, then lays hundreds of pale green eggs. The male releases sperm into the water over the eggs, then lets go of the female. Next, the female covers the eggs with sand and the pair returns to the water.

When the eggs hatch, they transform into embryonic horseshoe crabs, called trilobite larvae, that resemble the extinct marine arthropod with the same name. A few weeks later, they become immature crabs that molt and have gills and a tiny telson. Common on intertidal sand flats, these juveniles reach a length of about 4 centimeters in one year.

Horseshoe crabs, also called king crabs, continue molting up to three times a year, reaching sexual maturity in nine to 12 years. Research suggests that male horseshoe crabs quit molting after they reach maturity. Horseshoe crabs can live around 19 years.

Range and Distribution

Atlantic horseshoe crabs remain abundant along the Atlantic coast from Maine to Mexico. In North Carolina they can be found along the coast in shallow waters such as estuaries, sounds and river mouths. Related species exist on Asian coasts.

People Interactions

Most people consider the odd-looking horseshoe crab a curiosity. Relatively harmless, it is not used as food and has no real commercial importance. Yet scientists value these marine animals highly, for biomedical research especially. Substances found in the horseshoe crab's blood are routinely used to diagnose certain bacterial infections in humans and to make pharmaceuticals.

In the United States, populations remain healthy. But as recently as the 1980s, harvesters collected horseshoe crabs for fertilizer as the crabs came to shore to spawn in northern regions. Currently, protection exists on some governmental lands. The need for federal or state protection may arise elsewhere if severe dredging continues. Water pollution, too, may threaten this ancient survivor's existence.

References

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Credits

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Produced July 1995 by the Division of Conservation Education, N.C. Wildlife Resources Commission.

WILD Facts

ATLANTIC HORSESHOE CRAB

Classification
Class: Merostomata
Order: Xiphosura

Average Size
Can grow up to 2 ft. long and weigh 4 to 5 lbs.

Food
Primarily bivalves. Also marine worms, seaweed and dead fish.

Breeding
Spawn in spring and early summer. Female lays 2,000 to 30,000 eggs once a year. External fertilization.

Young
Eggs hatch into swimming trilobite larvae. In a few weeks they transform into juveniles. Reach sexual maturity in 9 to 12 years.

Life Expectancy
About 19 years.