Sea Science

A Series by SCDNR Marine Resources Division

Horseshoe Crabs

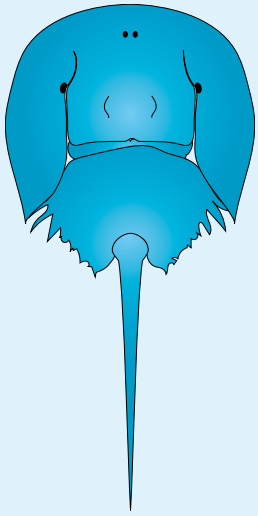
Horseshoe crabs are one of the most unique animals on the planet. Relatives to modern day horseshoe crabs inhabited the Earth over 400 million years ago, predating dinosaurs. The lack of change to the outward appearance of horseshoe crabs over the millennia has led to the description of horseshoe crabs as “living fossils”. Despite their name, horseshoe crabs are not true crabs. In fact, they are more closely related to spiders and scorpions. While horseshoe crabs may appear dangerous because of their armored body, numerous legs and intimidating tail, they are harmless to humans. Of the four modern species of horseshoe crab, the American horseshoe crab, *Limulus polyphemus*, inhabits South Carolina waters.

Horseshoe crabs spend most of their time on the seafloor, most likely following complex migration patterns that we do not yet fully understand. Research suggests that horseshoe crabs reside in nearshore deepwater bays and estuaries during the early years of their life and begin to migrate offshore to the continental shelf around 8 years of age. Horseshoe crabs can move quickly underwater and dig into the sand to feed on marine worms and invertebrates, shellfish and other bottom-dwelling organisms. Horseshoe crabs are not fully mature until about 10 years of age. Like all animals with an exoskeleton, they must molt to grow. To molt, horseshoe crabs shed their carapace, or exoskeleton, and form a new, larger carapace. Males will molt 16 - 17 times to reach adulthood, which can take up to 10 years. Females are larger than males and require an extra year and an extra molt before maturity. Molts can often be found along the South Carolina shoreline.

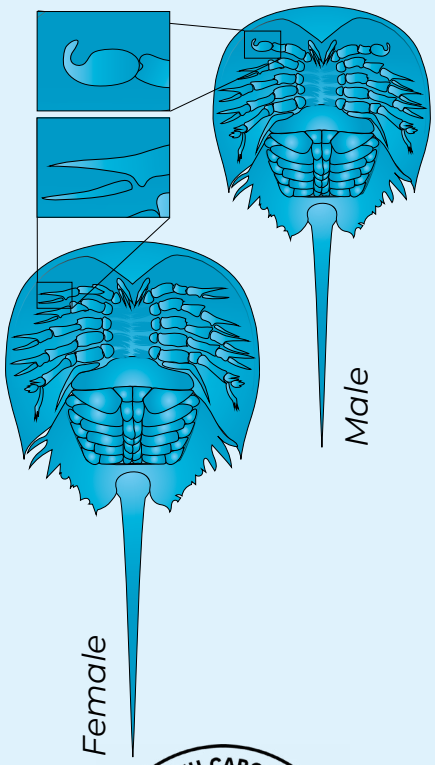
Mature horseshoe crabs come ashore in South Carolina to lay their eggs between early April and mid June. They typically congregate on beaches, and sometimes in the saltmarsh, during high tide around the full and new moon. A female comes ashore with a male attached to her back and digs a hole into which she lays her eggs. The attached male fertilizes the eggs as the female lays them in the nest. Males that came to the beach without a female, called satellite males, will sometimes join spawning pairs to attempt to fertilize the eggs as well. Females may lay seven nests in one visit and up to 100,000 eggs in one spawning season.

Identifying Adult Horseshoe Crabs

Top side



Underside



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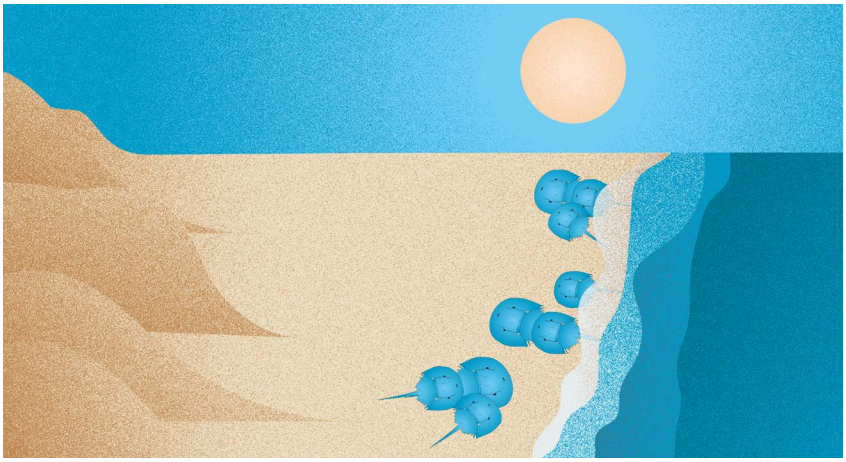
Horseshoe Crab Contributions

Horseshoe crabs are important both ecologically and economically. More than 20 species of migratory birds rely on horseshoe crab eggs for food. Many animals, including many fish species and Loggerhead and Kemp's ridley sea turtles, eat juvenile and adult horseshoe crabs. Additionally, horseshoe crabs contribute food to other species through their own feeding habits: horseshoe crabs eat small invertebrates found in the sediment and their digging during feeding and spawning brings buried minerals and nutrients to the surface, making them available to other animals to consume.

Horseshoe crabs are a very important asset to modern medicine. They are harvested for their unique blue blood, which is the fourth most expensive liquid in the world. Their blood is blue because of the copper-based molecules that transport oxygen through their circulatory system. Most vertebrates, including humans, have iron-based molecules instead. Horseshoe crab blood is extracted to create a product called Limulus Amoebocyte Lysate (LAL) which is used to test intravenous drugs, vaccines and medical devices for bacterial contamination. In South Carolina, adult horseshoe crabs are harvested during spawning season and brought to laboratories where about one-third of their blood is removed before they are released.

To increase knowledge of horseshoe crab migration, habitat utilization, population levels and spawning behaviors, SCDNR biologists conduct spawning surveys and horseshoe crab tagging all along the coast of South Carolina.

Contribute to ongoing research



You can help biologists study South Carolina's horseshoe crabs by reporting sightings of spawning in South Carolina (typically during full or new moons from April to June). Whether you spot a lone pair or a gathering numbering in the hundreds, your observations can contribute to ongoing research projects. Report horseshoe crab spawning at bit.ly/HSCsighting