Horseshoe Crab

(Limulus polyphemus)

Destroy the horseshoe crab's habitat and a vital link in the migratory chain would be broken, and thousands, perhaps millions, of shorebirds endangered.

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A True Story of Interdependence

A wave slaps the Delaware Bay shore and an American horseshoe crab tumbles out of the surf. It's early May.

The crab claws its way in a slow, clumsy advance over a mudflat, jerking along like a toy Army tank with a cranky spring-wound motor.

One by one the crabs leave the sea for beaches on both sides of the bay until millions of these olive drab creatures blot mud and sand. It is one of the oldest journeys on earth, older than dinosaurs, and it is an important one. For it is on the bay's beaches that the horseshoe crabs breed, propagating a species that dates back over 300 million years.

At water's edge males court females, attaching themselves to the rear of the female's carapace (or shell) with pincer-like appendages. Then the females tow their suitors up the beach, scratch out hollows in the sand, and lay tiny pea green eggs which are fertilized by the males. But the waves at high tide wash away much of the sand and soon billions of the eggs lay exposed on the beaches.

Thousands of miles away another biological clock is ticking. Red knots, ruddy turnstones, sanderlings, and semi-palmated sandpipers are already in flight, leaving behind their wintering grounds in Central and South America—the mudflats of Surinam, the rocky nooks at Tierra del Fuego, the meadows on the Argentine Pampas.

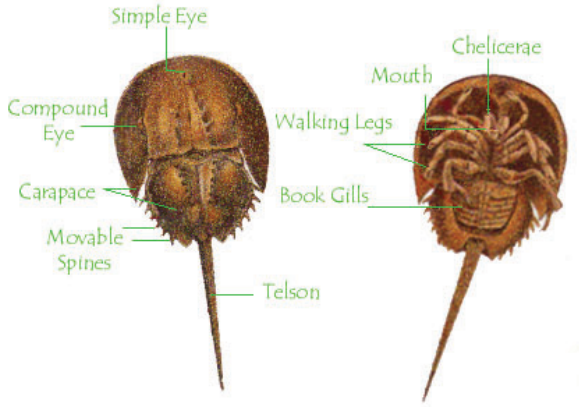
They're winging some 7,000 miles towards the bay and the little green eggs which are now crucial to their survival. Depleted of fat reserves on arrival, many birds will almost double their body weight during their two-week stopover before departing on the next leg of their journey—a 2,000-mile, non-stop flight to their Arctic breeding grounds. By late June, the shorebirds will be nesting on the thawing tundra.

The Delaware Bay is the principal breeding grounds for American horseshoe crabs on the East Coast and among the largest staging areas for shorebirds in North America. And it is unique in that there's only one main course on the menu: the little green eggs. Destroy the horseshoe crab's habitat and a vital link in the migratory chain would be broken, and thousands, perhaps millions, of shorebirds endangered.

Horseshoe crabs. *(Photo courtesy of the U. S. Fish and Wildlife Service)*

Red knots and horseshoe crab. *(Photo courtesy of the U. S. Fish and Wildlife Service)*

Life Cycle of the Horseshoe Crab



Every spring, warming waters stir the crabs from the depths of the Delaware Bay and Atlantic Ocean to the sandy coastlines of Delaware and New Jersey. At the high tides of the full and new moons, female horseshoe crabs come ashore to lay their eggs. Waiting at the tide line, a male grabs hold of the female's shell.

The female digs a shallow nest in the sand and lays up to 20,000 small, olive-green eggs. Next she drags the male over top to fertilize the eggs. Then they cover the eggs with sand and return to the water.

After two to four weeks, the 1/8 inch-long juvenile crabs hatch, dig to the surface, and head for the water. Feeding on tiny worms, clams and dead fish, the young crabs continue to grow and molt until they reach sexual maturity around 10 years of age. Females typically attain larger sizes than males.


Hatchling Horseshoe Crab

Although no reliable method is currently available to directly age horseshoe crabs, it is believed that they may live up to 20 years.

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For more Horseshoe Crab information, please visit https://www.nj.gov/drbc/basin/living/horseshoe-crabs.html

Horseshoe Crab Facts

Related to spiders and scorpions, the horseshoe crab (Limulus polyphemus) has changed little in 300 million years. Once there were many species of these trilobite-like creatures, but only four remain today. The Delaware Bay is home to the largest population of spawning horseshoe crabs in the world.

Horseshoe crabs are anything but glamorous. Many folks consider them pests that litter the beaches. Some think their harmless tails are dangerous weapons. We've ground them up for use as nitrogen-rich fertilizer, or hog and chicken food. There also is a long tradition in the Delaware Bay of harvesting horseshoe crabs for use as bait in various fisheries, such as conch (whelk) and American eel.

Eons of evolution have perfected traits important to medicine. Nobel prizes have been awarded for scientific research conducted on the horseshoe crab. Much of what we know about the human eye and how we see began over 50 years ago with studies of the horseshoe crab's large, compound eye.

Researchers have also studied the horseshoe crab's chitin, a cellulose-like compound in its shell. Unlike other arthropods, the horseshoe crab's chitin is very pure. Chitin-coated sutures and burn dressings increase healing time with less pain than standard treatments.

In the 1960s, it was discovered that the horseshoe crabs' copper-based, blue blood contains a special clotting agent which attaches to bacterial toxins. Today, Limulus Amebocyte Lysate (LAL), which is manufactured from horseshoe crab blood, has become the worldwide standard screening test for bacterial contamination. Every intravenous drug, vaccine, and surgical implant, such as pacemakers and prosthetic devices, must be tested using LAL. Horseshoe crab blood has recently been found to be useful in cancer research as well.

Blood from horseshoe crabs is obtained by collecting adult crabs, extracting a portion of their blood, and releasing them alive. Following bleeding, most crabs are returned to near the location of their capture. It is estimated that over 400,000 crabs are harvested annually for biomedical purposes, and the estimated crab mortality during and after the bleeding process is anywhere from 10-30%. Scientists are researching whether a synthetic substitute can be used as a viable alternative.

Did You Know?

Horseshoe crabs molt or shed their shell to grow. Molting occurs several times during the first two to three years with longer periods between molts as the horseshoe crab grows larger. With each molt, the horseshoe crab increases in size by an estimated 25-30%.

Molting occurs approximately 16 to 17 times over a period of 10 to 12 years before sexual maturity is reached. Females reach maturity about one year later than males and therefore go through an additional molt. It is believed they no longer molt after reaching maturity.

Hungry shorebirds darken a Cape May, New Jersey beach. *(Photo by Susan Owens)*