



Horseshoe Crab and Shorebirds Fact Sheet

What is the Delaware Estuary?

The Delaware Estuary is located in the Mid-Atlantic region of the United States, surrounded by portions of Pennsylvania, New Jersey and Delaware. An estuary is where fresh water from a river mixes with salt water from an ocean or bay. Estuaries are fragile ecosystems, which support some of the Earth's richest and most productive habitats. The Delaware Estuary stretches approximately 134 miles, from the falls of the Delaware River between Trenton, New Jersey and Morrisville, Pennsylvania, south to the mouth of the Delaware Bay between Cape May, New Jersey and Cape Henlopen, Delaware.



For more information:

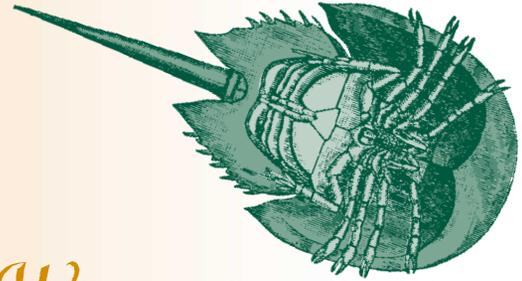
www.horseshoecrab.org

www.dnr.state.md.us (search horseshoe crab)

<http://winnie.fit.edu/~ehlinger/>

www.usgs.gov/ (search horseshoe crab)

Fact: The horseshoe crab plays a vital role in the life of anyone who has received an injectable medication. An extract of the horseshoe crab's blood is used by pharmaceutical and medical industries to ensure that their products are free of bacterial contamination. No other test works as easily or reliably for this purpose.



What is the Horseshoe Crab and Shorebird Connection?

The Delaware Estuary is home to thousands of animal species, including the world's largest population of horseshoe crabs. Each spring, adult horseshoe crabs journey from the depths of the ocean to Delaware Bay beaches to spawn. This occurs mostly during high tides in May and June, especially near the new and full moons when daily tides are highest. The male crab attaches to the back of a female crab's shell as she comes ashore to spawn. (The female crabs aren't able to produce eggs until they reach 11-12 years of age.) The female digs several inches into the sand and lays a series of "clusters" of eggs. Each cluster can contain upwards of 4,000 eggs. As the female moves over the beach, she drags the male crab over the clusters laid in the sand to fertilize the eggs. Often, you can see more than one male attached to one female. In these cases, each male is competing to fertilize eggs and jostling for the best position to do so. Once spawning is complete, the female crab and attached males head back to the bay, and the eggs are left buried in the sand to develop and hatch.

At the same time the horseshoe crabs are beginning to lay their eggs in Delaware Bay hundreds of thousands of shorebirds are traveling northward from South America en route to their breeding grounds in the arctic. The shorebirds stop in the Delaware Estuary to feed on the horseshoe crab eggs. Buried eggs migrate to the surface through wave action and repeated "digging" by other horseshoe crab. Eggs on or near the surface are an easily accessible source of food for many birds. Red Knots, Dunlins, Ruddy Turnstones, Sanderlings, Semi-Palmated Sandpipers, and other species of migratory shorebirds feed on horseshoe crab eggs almost exclusively during their stopover. Each bird can (and will) eat thousands of eggs per day. A sanderling weighing 50 grams, for example, can eat one horseshoe crab egg every five seconds for 14 hours a day. The eggs provide the energy that the shorebirds need for their flight to the arctic.

Why is protecting this interaction between the horseshoe crab and shorebird so important?

The Delaware Estuary is an ecosystem. This means any actions within that system affect the entire system. The Delaware River is relied upon by industry for operations, shipping, and manufacturing. It is a source of drinking water for millions of people and home to thousands of species. This shared use of our water resources means a shared responsibility for that resource.

The interrelationship of the shorebird and horseshoe crab can, for example, be negatively affected by habitat loss, a loss of coastal wetlands due to increased development, erosion, a rise in sea level, climatic changes, and a decline in horseshoe crab population due to commercial harvesting.

A reduction in horseshoe crab population could mean that there will be fewer eggs for the shorebirds to eat, not giving them enough energy to reach their breeding grounds.

What are we doing to protect these species?

From government agencies, to fishermen, to scientists and researchers, to groups in our local communities, much is happening to protect the shorebirds and horseshoe crabs in our region.

In response to protecting the horseshoe crab population:

-  The Atlantic States Marine Fisheries Commission enacted horseshoe crab harvesting control measures for fishermen in Delaware, New Jersey, Maryland, and Virginia.
-  The U.S. Department of Commerce designated a 1,500 square-mile horseshoe crab preserve in federal waters to protect horseshoe crabs. The sanctuary is located 30 miles into the Atlantic Ocean, extending from Peck's Beach, New Jersey to Ocean City, Maryland. This area was chosen because it has the largest horseshoe crab population on the East Coast.
-  The Ecological Research & Development Group ("ERDG") a nonprofit organization based in Milton, Delaware, and the Virginia Institute of Marine Studies conducted a study focused on devising alternative bait bags for fishermen. The study discovered that by using these alternative bait bags, commercial fishermen would need to use less bait, thus successfully reducing the number of horseshoe crabs being harvested. ERDG has since produced and distributed more than 6,000 bait bags to fisherman in Maryland, Delaware, and New Jersey.

To monitor the needs of shorebirds:

-  Teams of researchers from both Delaware and New Jersey have been monitoring specific species of birds for weight gain, gender, molt, wing length, bill length, etc., while they are in the Delaware Estuary. This monitoring of a sub-set of species allows a better picture of the health of the population and allows us to determine which habitat types are preferred for foraging and roosting.
-  The New Jersey Department of Environmental Protection conducted a study to determine what effects a horseshoe crab egg decline might have on the red knots' survival. Their work provided a baseline for establishing the viability of the red knot population. Over the coming years, if a population decline is detected, scientists will be able to distinguish effects and provide researchers and conservationists with an early warning sign.



What can you do?

There are a number of organizations and agencies in need of volunteers to assist in spawning surveys and community outreach initiatives.

The ERDG has educational materials to help you learn more about the shorebirds and horseshoe crabs. Community outreach activities, including the Just flip 'em! campaign; habitat conservation projects; research and development initiatives; and legislative action are all ways to protect these species. Call the ERDG at (302) 684-3373 or check out their website at www.horseshoecrab.org to find out more.

The University of Delaware and Limuli Labs coordinate horseshoe crab spawning surveys on both sides of the Bay for which volunteers are needed. To volunteer, please call (302) 739-3451. For additional volunteer opportunities, contact the St. Jones Reserve in Dover, Delaware at (302) 739-3436.

See the front of this sheet for websites that provide valuable information about horseshoe crabs.

The horseshoe crab is extremely important for medical research. Much of what we know about the human eye began with research on horseshoe crabs. Horseshoe crabs have ten eyes. They have the ability to make their eyes one million times more sensitive at night and can see up to three feet away. In addition, the chitin, or cellulose-like compound, in its shell is used in sutures and burn dressings to increase healing time. Lastly, the horseshoe crab's copper-blue blood contains a special clotting agent called lysate that reacts to bacterial toxins, allowing pharmaceutical companies to use it to test the purity of new drugs.