



Protecting Birds, Food and Habitats

Delaware Bay is home to the largest spawning population of Horseshoe Crabs in the world. The Horseshoe Crab is an ancient species, dating back over 350 million years. Delaware Bay is also critical habitat to more than 400 species of birds and migrating shore birds. Each spring, at least 11 species of birds stop over on the Delaware Bay shore to feed on the eggs of the Horseshoe Crab and thereby fuel their annual spring migration, including the Sanderling, Sandpiper, Red Knot, and Ruddy Turnstone.¹⁶⁴

It is estimated that between 425,000 and 1,000,000 birds stop in the Delaware Bay as part of their 3,000 to 4,000 mile migratory journey from their wintering grounds in South America to their breeding grounds in the Arctic.¹⁶⁵ The bird stop over is ecologically timed to coincide with the spawning of the Horseshoe Crabs, their eggs being a critical food source.¹⁶⁶ The eggs of the Horseshoe Crab are so critical that recent declines in their abundance threaten the survival of the Red Knot (*Calidris canutus*).

In 1982, 95,530 Red Knot were counted on the shores of the Delaware Bay. In 2006 only 13,445 were observed during the same time period¹⁶⁷ and a more recent study continues to show declines and low weight gain for the birds that do arrive to feed on Horseshoe Crab eggs. The Red Knot is now predicted to go extinct because of declines in the Horseshoe Crab and their eggs.¹⁶⁸ Other shorebirds that rely on Horseshoe Crab eggs, such as Ruddy Turnstone (*Arenaria interpres*), Semipalmated Sandpiper (*Calidris pusilla*), Sanderling (*Calidris alba*), Dunlin (*Calidris alpina*) and Short-Billed Dowitcher (*Limnodromus griseus*), have also declined in numbers on the Delaware Bay migratory stop over. These species and Red Knot make up 99 percent of the shorebird concentration in the Delaware Bay and all are primarily dependent upon Horseshoe Crab eggs for their diet.¹⁶⁹

The arrival, feasting and migration of the shorebirds supports a multi-million dollar ecotourism industry. Birding and outdoor enthusiasts from all over the world flock to the Delaware Bay shore to watch the spectacular feeding frenzy. During their visit they buy recreational-related goods and services, stay in the region's hotels, and visit parks and patronize restaurants and local shops.¹⁷⁰ According to one report, Horseshoe Crab dependent ecotourism generates between approximately \$7 million and \$10 million of spending in Cape May, New Jersey alone, and creates 120 to 180 related jobs providing an additional \$3 million to \$4 million in social welfare value.¹⁷¹

INDICATOR SPECIES

Protecting bird species throughout the basin is important for several reasons.

Not only is bird watching one of the most popular and lucrative forms of recreation, bringing in tourists from all over the world, but birds are an *indicator species*. Indicator species represent the overall health status of an area through their population numbers and habitats. Healthy rivers are habitat for healthy bird populations. If bird populations begin declining, it can mean that the overall quality of life for an area may be declining as well. Abundance in bird species is a good sign that land condition and air quality are high enough to support ample birds and bird watchers alike.

According to a New Jersey Department of Fish and Wildlife report, the economic value of the Horseshoe Crab and migratory bird phenomenon seasonally for the Delaware Bay shore area is over \$11.8 million with over \$15 million of economic value generated if other beneficiaries beyond New Jersey are included. Annually, it provides \$25 million in benefits to the Delaware Bay shore region and \$34 million regionally.¹⁷² Because most of these expenditures occur in the "off-season", it is particularly valuable to local economies.

The fishery use of Horseshoe Crabs as bait for whelk, eel and conch, is highly controversial. Decades of overharvesting and abuse have resulted in a decline in the Horseshoe Crab population to such a level that the Red Knot is predicted to go extinct because of a lack of Horseshoe Crab eggs needed to fuel their annual migration.¹⁷³ Since 1989 Horseshoe Crabs in the Delaware Bay have shown a steady decline with the lowest counts taking place in most recent years.¹⁷⁴ To combat this ecological crisis, many are calling for a moratorium on the bait harvest of Horseshoe Crabs in order to allow the Crabs, the eggs and the birds to replenish and restore so that all dependent industries can be supported in the future. New Jersey issued regulations that established a moratorium for 2006 and 2007; and in 2008 passed legislation to keep the moratorium in place until the Red Knot population is restored and stable.

The continuing existence of the Horseshoe Crab and migrating shorebird phenomenon are vital for the related ecotourism industry. Of those surveyed, only 6.6% said that the Horseshoe Crab and shorebird phenomenon was unimportant to their visitor satisfaction. On average those surveyed said they would be willing to pay as much as \$212.45 (in decreased annual household income) annually for a program to protect these resources; and that they would “be willing to tolerate no more than 50.7% decline in Horseshoe Crabs and migrant shorebirds before they would cease visiting the Delaware Bay shore area.”¹⁷⁵

Horseshoe crabs also provide critical health protections to humans. The Horseshoe Crabs in Delaware Bay are irreplaceably important to the biomedical industry. In the late 1960’s, researchers at Johns Hopkins University demonstrated that special blood properties from Horseshoe Crabs could be used to detect endotoxins.¹⁷⁶ As a result, the U.S. Food and Drug Administration now requires that many intravenous drugs and medical implants be tested for endotoxins using Limulus Amebocyte Lysate (LAL), found exclusively in the blood of Horseshoe Crabs.¹⁷⁷ In addition, LAL is used for detecting diseases including spinal meningitis.¹⁷⁸ No artificial alternatives to the LAL test currently exist.¹⁷⁹ To obtain the blood the Horseshoe Crabs are bled non-lethally,¹⁸⁰ although it has been estimated that between 10 and 15% may die once the Crabs have been returned to their natural environment.¹⁸¹

The U.S. Fish and Wildlife Service valued annual revenues associated with the LAL industry at \$60 million with the social welfare value at \$150 million. One pint of Horseshoe Crab blood is worth \$15,000 to the bio-medical industry,¹⁸² and the industry creates between 145 and 195 jobs in each of the regions it operates (Falmouth, Massachusetts, Walkersville, Maryland and Charleston, South Carolina), contributing \$73 million to \$96 million total to these local economies. ¹⁸³ Furthermore, the industry is expected to grow between 8-10% annually.¹⁸⁴

Status

New Jersey passed, in 2008, strong legislation to protect the horseshoe crabs for the purposes of protecting the migratory shorebirds. New Jersey issued a moratorium that will remain in place until key factors demonstrate the crabs and the birds are on the path to recovery.

Delaware and the Atlantic States Fisheries Management Council refuse to take the strong action needed. They continue to cut deals that allow the harvest of horseshoe crabs to continue despite the ramifications of failing to restore the horseshoe crabs and the birds to sustainable and historic levels.

The ASMFC is once again (2010) debating the issues of the horseshoe crabs and seems to be struggling with finding a way to justify increased harvests, despite that many of the scientists within their ranks, particularly the shorebird scientists, dispute the scientific and ecological appropriateness and wisdom of such action.



**Reference Cited Sources to Delaware Riverkeeper Network's River Values: The Value of a Clean and Healthy Delaware River. Found on www.delawareriverkeeper.org*

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