

Understanding Horseshoe Crab Population Dynamics in New York and New Jersey National Parks

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Horseshoe Crabs in Coastal New York and New Jersey National Parks



Horseshoe crabs spawn on the beaches of Fire Island National Seashore, Sagamore Hill National Historic Site and Gateway National Recreation Area; however, little is known about the spawning population dynamics in terms of spawning densities, spawning sex ratios, or egg densities at these beaches. Information on these basic population parameters is essential for the conservation and management of this species.



Beginning in 2012, spawning surveys will be conducted at beaches within these parks for 5 days surrounding new and full moon high tides in May and June. Horseshoe crabs will be counted, sex determined, and the number of pairs (a female with an attached male), satellite males (males in close proximity to a pair), and solitary males will be recorded.

We will tag horseshoe crabs as part of the US Fish and Wildlife Service (USFWS) Cooperative tagging program. Recapture sightings of horseshoe crabs tagged within our parks will become part of a national database and will help us to understand if horseshoe crabs remain within a localized area or travel widely.



USFWS tag on a crab.

We will also study short-term movements of horseshoe crabs in Great South and Jamaica Bays using telemetry and sonic transmitter tags. Sonic transmitter tags emit an acoustic signal that can be tracked underwater. These tags will help identify where horseshoe crabs are spending their time within each of these Bays.



Horseshoe crab with sonic transmitter and USFWS tags.

Horseshoe Crab Ecology and Socio-Economic Importance



The American Horseshoe crab (*Limulus polyphemus*) is an important part of the marine ecosystem. They are predators that eat small clams, worms and crustaceans, are preyed upon by loggerhead sea turtles and sharks, and their eggs are an important food for migrating shorebirds.

The horseshoe crab is also a valuable socio-economic species. It is harvested and used as bait in the eel and conch fishery. *Limulus* amoebocyte lysate (LAL) is produced from horseshoe crab blood. LAL is the standard test used to screen all medical equipment that comes in contact with blood or spinal fluid.

Developing Park Based Citizen Science Monitoring Programs

During a three year pilot program, we will work with FIIS, SAHI and GATE to recruit and train volunteers to conduct spawning surveys within each park. Citizen scientists will greatly increase the parks' capacity to monitor horseshoe crabs, as well as contributing to the management and understanding of a regionally important species. In addition, citizen-science directly connects park visitors and partners with natural resources and resource management issues.

Monitoring at park beaches will be coordinated with the New York horseshoe crab monitoring network. The state network offers annual volunteer training. In addition to providing parks with essential information for management of this species, park based monitoring will expand the state network which currently includes only one NPS beach. Data coordination will ensure that NPS monitoring efforts contribute to regional management of this species via state reporting to the Atlantic States Marine Fisheries Commission.



Horseshoe crabs with USFWS tags.

Through park interpretive programs, park visitors are encouraged to report tag sightings. By reporting the location of tagged crabs, data on the distribution, movement, longevity and mortality of horseshoe crabs is entered into a national database. By reporting a tag, participants receive a pewter horseshoe crab pin from USFWS.