



DELAWARE AUDUBON SOCIETY

Chapter of National Audubon
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October 1, 2006

Roy W. Miller, Fisheries Administrator
Division of Fish & Wildlife
Department of Natural Resources &
Environmental Control
89 Kings Highway
Dover, Delaware 19901

RE: Proposed Changes to Horseshoe Crab Regulations

Dear Mr. Miller:

Delaware Audubon was incorporated in Delaware as a non-profit organization in 1977. Delaware Audubon is a statewide chapter of the National Audubon Society and is dedicated to developing a better appreciation of our natural environment and working for species and habitat protection and conservation. Delaware Audubon consists of over 1,500 members throughout the state advocating on a wide range of environmental issues and sponsoring programs, field trips and school education. Our focus is on protection of the Delaware Bay and the Coastal Zone. We appreciate the opportunity to provide comments on an issue of great importance to our organization and its members.

The Delaware Audubon Society offers the following comments on the options presented in the proposed changes in the Horseshoe Crab regulations as published in the September 1, 2006 Delaware State Register. Delaware Audubon encourages the Department adopt Option 2, a **Full Moratorium** on the harvesting and landing of horseshoe crabs Delaware for two years. Our recommendation is based on the following information:

1. Red knots feed almost exclusively on horseshoe crab eggs during spring migration on Delaware Bay beaches. No alternative equivalent food source exists. Examination of stomach contents has shown them to be more than 95% full of horseshoe crab eggs. ^{1, 2}
2. The decline in red knots tracks the significant increase in horseshoe crab landings that targeted egg-bearing females with subsequent decrease in horseshoe crab eggs available to foraging shorebirds. ^{3, 4, 5, 6}

- a. The decline in Red Knot populations has chiefly been caused by the lack of sufficient eggs for foraging birds on the Delaware Bay. Prior to the over-harvest of horseshoe crabs, the Knot weight rate increase was the highest in the world, recorded at nearly 9 g/day in the late 1990's. The rate declined to a low of 2 g/day in 2002. Low weight gain rates results in fewer individuals reaching the arctic breeding grounds and higher adult mortality.
 - b. Red Knots on the Delaware Bay declined from over 100,000 in the 1980's to 15,000 in 2005.
 - c. Prior to 1998, millions of horseshoe crabs were taken from the Delaware Bay population in an unregulated fishery. The subsequent regulations that were adopted were never based on sustainable, demographic models linked to shorebirds foraging needs. Rather the harvest quotas were set through an arbitrary reduction from the peak harvest.
 - d. The Delaware Bay-wide trawl survey (1990-present) has recorded a statistically significant decrease in the number of Horseshoe Crabs on the Delaware Bay.
 - e. The decline in horseshoe crab eggs available to foraging shorebirds mirrors the decline in adult horseshoe crabs.
 - f. Horseshoe crab egg density on New Jersey beaches declined from 40,000-100,000 eggs/m² in the 1990's to 1,500 eggs/m² in 2005.
3. Published population models of the Red Knot *rufa* subspecies indicate that the bird will be at or near extinction around 2010. The authors concluded that the Red Knot faces "imminent endangerment".³
 4. Ornithologists from four continents have been researching Red Knots on their wintering, migration and breeding grounds. The major factor for the population decline is the lack of horseshoe crab eggs at the Delaware Bay.^{3, 4, 5, 6}
 - a. The primary wintering grounds in South America, Tierra del Fuego, were investigated – no evidence of factors to account for decline.
 - b. The primary breeding grounds in the Arctic were investigated – no evidence of factors to account for the magnitude of the decline. Perturbation in arctic weather may impact the population, but this impact is diminutive compared to the Delaware Bay food collapse.
 - c. Other shorebirds, which rely on Horseshoe Crab eggs for food on the Delaware Bay, have shown similar declines in weight gain rates and population size.
 - d. The Hudsonian Godwit which over winters with the Red Knot in Tierra del Fuego but do not use the Delaware Bay stopover site have not shown declines. This further corroborates the conclusion that conditions on the wintering grounds are not responsible for the Red Knot declines.
 5. Major factors that are affecting the Red Knot population decline include decline in horseshoe crab egg density and later arrival of shorebirds. Factors that may exacerbate this situation include beach erosion and increased human disturbance and gull competition. The impact of human disturbance and gull competition were not a major factor when horseshoe crab egg densities were at 40,000 to 100,000 eggs/m². The number of gulls foraging on the Delaware Bay beaches of NJ has not changed since the early 1990's.^{3, 4, 5, 6}

CONCLUSION

1. Significant change has taken place at only the Delaware Bay stopover for the Red Knot – the removal of their food source from Delaware Bay as the result of the over fishing of horseshoe crabs.
2. Based on exhaustive scientific analysis, the decline in eggs on the Delaware Bay has been conclusively shown to be the major cause of the precipitous decline of the Red Knot subspecies.
3. The only action that can be taken to address the immediate threat is to enact a moratorium on the harvest of horseshoe crabs. Beach replenishment and artificial bait development are long-term options only and cannot address the immediate and urgent conservation needs of the Red Knot.
4. Delaware Audubon supports the concept of providing financial assistance to horseshoe crab harvesters to help offset the monetary loss they will incur as a result of the moratorium.
5. The concept of a male-only take alternative as presented by Dr. Carl N. Schuster, Jr. in his paper titled “In Support of Harvesting Excess Adult Male Horseshoe Crabs, *Limulus polyphemus*, in the Delaware Bay Area” and presented by Rick Robins in “Notes on Implementation of Male-only Horseshoe Crab Harvest For Delaware Bay” dated April 3, 2006, which serve as the foundation for Option 1 in the proposed rule is not based on or supported by any peer-reviewed scientific studies or reports and contains numerous errors in citations and conclusions and should not be given consideration. ⁷

Although recent data suggest that the horseshoe crab population in the Delaware Bay has stabilized and shows possible indications of rebounding, levels are currently insufficient to provide optimal conditions to support recovery of the Red Knot population. Pulling the Red Knot back from the brink of extinction demands dramatic and decisive action similar to that taken by the State of New Jersey. We believe the State of Delaware made a commitment to New Jersey officials and to the Delaware conservation community to enact a two-year moratorium on horseshoe crab harvesting, recognizing the jeopardy this species faces. We respectfully request you honor that commitment.

Most sincerely,

s\Nicholas A. DiPasquale

Nicholas A. DiPasquale
Conservation Chair

Enclosures

pc: Delaware Audubon Board of Directors

* Adapted in large part from *Red Knots, Horseshoe Crab Eggs and the Delaware Bay: The Connections* by Eric Stiles, NJ Audubon.

CITATIONS

1. Haramis, M. (USGS Patuxent Wildlife Research Center, Laurel MD). 2005. Pers Comm. Manuscript submitted to Auk - in review.
2. Tsipoura, N., and J. Burger. 1999. Shorebird diet during spring migration stopover on Delaware Bay. *Condor*. 101: 635-644.
3. Baker, Allan J., Patricia M. Gonzalez, Theunis Piersma, Lawrence J. Niles, Ines de Lima Serrano do Nascimento, Phillip W. Atkinson, Nigel A. Clark, Clive D.T. Minton, Mark K. Peck, and Geert Aarts. 2004. Rapid population declines in red knots: fitness consequences of decreased refueling rates and late arrival in Delaware Bay.
4. Morrison, R.I. Guy, P. Kenyon Ross and Lawrence J. Niles. 2005. Declines in wintering populations of Red Knots in Southern America. *The Condor*. 106:60-70.
5. Clark, Nigel, Sitters, Humphrey, Clive Minton and Lawrence J. Niles. 2005. Congressional Briefing, June 2, 2005. Washington, D.C..
6. Stiles, Eric, David Mizrahi and Lawrence Niles. 2005. Meta-analysis of Horseshoe Crab and Shorebird Research on the Delaware Bay - Are there enough Horseshoe Crab eggs to sustain spring shorebird migration? Published proceedings from the Delaware Estuary Conference. January 2005.
7. *The Robins Report on Horseshoe Crab Management: Unscientific, Unreliable, and Unacceptable for Public Policy* prepared by the American Bird Conservancy, the New Jersey Audubon Society, the National Audubon Society, the American Littoral Society, the Delaware Riverkeeper and Delaware Audubon. January 2006. This paper discredits the validity of the male-only take alternative as embodied in Option 2 of the Addendum.