

Delaware Audubon Society, American Bird Conservancy, American Littoral Society, Defenders of Wildlife, Delaware River Keeper Network, National Audubon Society, New Jersey Audubon Society

September 21, 2007

Mr. Roy Miller  
Delaware Department of Natural Resources and Environmental Control  
89 Kings Highway  
Dover, DE

RE: Proposed Horseshoe Crab Regulations SAN #

Dear Mr. Miller,

The undersigned organizations continue to urge the State of Delaware to enact a moratorium on the horseshoe crab commercial bait fishery and harvest. This moratorium is needed to protect the future of the migratory shorebirds, including the imperiled Red Knot, and will support the full recovery of the horseshoe crab population to levels needed to restore its critical role in the Delaware Bay ecosystem. While the current regulatory proposal is necessary to bring the State into minimal compliance with the Atlantic States Marine Fisheries Commission Addendum IV to the Horseshoe Crab Management Plan, it is insufficient to meet the State's obligation to protect its natural resources, exercise appropriate caution in allowing the commercial harvest of horseshoe crabs in the absence of adequate understanding of the consequences of the proposed harvest, and is insufficiently risk averse as regards restoring the horseshoe crab population to a point where it can support the energetic needs of the shorebirds of Delaware Bay.

The importance of the horseshoe crabs eggs as the critical and sole food supply for red knots and other migratory shorebirds is well established in peer reviewed scientific literature, all of which has been reviewed by DNREC and which we request be made part of the official record on this regulatory proposal. This food source has declined significantly, from a high of 50,000 eggs per square meter in the early 1990's to approximately 3,000 eggs per square meter in 2000. Without this primary food source, by which the Red Knots double their body weight, the reproductive cycle of the Red Knot cannot be complete.

Having traveled from Tierra del Fuego to the Delaware Bay, the shorebirds must then fly on to their nesting grounds in the Arctic. The decline in the amount of horseshoe crab eggs has resulted in fewer Red Knots being able to migrate to the Arctic and successfully reproduce. Recent surveys have shown that 97% of the worldwide Red Knot population winters in Tierra del Fuego, stops along the Delaware Bay and continues to the Canadian/Arctic tundra for nesting. Since 1985, there has been a 75% decline in this red knot population.

The population of only 17, 653 red knots is in jeopardy of extinction. Only 17% of the birds attained sufficient body weight to migrate and reproduce between 2002 and 2005. Consequently, there was a decline in adult survival and productivity, and a severe decline in population. If more eggs are not available to the Red Knot population, it may be extinct within the next decade. This dire prediction has been affirmed by DNREC in its own public presentations (such as at the public hearing on September 28, 2006), citing Baker et al 2004 among others.

A moratorium is clearly within the statutory authority and obligations of the DNREC to manage the resources subject to the jurisdiction of the Atlantic States Marine Fisheries Commission (ASMFC) FMP holistically, recognizing and managing for the interrelationships between them. These obligations demand that DNREC demonstrate that its harvest policies can insure that sufficient horseshoe crabs are present to provide the superabundance of eggs needed to meet the energetic needs of the shorebirds, as well as restoring and sustaining the crab population itself. Indeed, we believe the DNREC is obligated to establish a moratorium given the well established science regarding both the horseshoe crab-shorebird connection, the present endangered status of the Red Knot and the expert opinion provided to the ASMFC and the Shorebird Technical Committee that the scarcity of eggs is the paramount and controlling reason for the Red Knots' population decline. In other words, the current authorized harvest of horseshoe crabs is obviously not providing for a population sufficient to meet these requirements, as concluded by both the leading scientists on the issue, and the ASMFC's Shorebird Technical Committee.

The moratorium on harvesting horseshoe crabs for bait is a risk averse strategy which will maximize the opportunities to increase the number of eggs available to migratory shorebirds including the Red Knot immediately, as well as aid in the restoration of horseshoe crabs to a healthy population capable of supporting itself as well as the energetic needs of the birds in long run.

We are opposed to the non-moratorium proposal presented for public comment -- the so-called "male only harvest. We along with other members of the conservation community have submitted background material to DNREC previously, drawn from what available primary research exists regarding the importance of satellite males to horseshoe crab spawning, as well as research indicating that mating is strongly associated with differences in male age and condition. DNREC does not know enough about either the population of horseshoe crabs or the effects of removing males from the population to establish that this option could be pursued without significant adverse impacts; indeed, at the public hearing in 2006 DNREC staff testified that there are no predictive models available, nor were any considered in developing the proposed male only rule. Additionally, the DNREC has acknowledged that it is operating in the absence of fundamental information both about the life history and population biology of the horseshoe crab and the energetic needs of the migratory shorebirds. Issues associated by this lack of analysis and reasonably informed understanding of the consequences of the proposed action by DNREC are addressed in comments submitted by Dr. Daniel Hernandez as part of this record: we support these comments, and ask that they be appended to our comments. These facts must be coupled with the problems that can be responsibly predicted to be associated with enforcement of a male only take; following the recent reductions in allowable harvest levels, Delaware saw a significant upsurge in regulatory violations. Both the DNREC and ASFMC admit that these enforcement issues may result in by-catch of female horseshoe crabs with an undetermined impact. DNREC cannot responsibly predict the impact of a male only harvest on either the recovery of the horseshoe crab population in Delaware Bay or the migratory shorebirds. To characterize this proposal as a "conservation equivalent" to a full moratorium is simply "spin", and has no scientific basis. Much reliance has been placed on the estimated sex ratios between male and female horseshoe crabs in Delaware Bay; assertions have been made that taking

100,000 male crabs per year will have “no detectable impact” citing the ASMFC. However, no scientific validation of these statements has been offered for the record; in fact, DNREC staff testified that, lacking predictive models, they were unable to characterize the effect. This cannot be taken to mean that there is no effect, only that DNREC cannot predict it.

Additionally, gear practices currently allowed to harvest crabs do not protect female crabs or the juvenile crabs; this proposed rule has been offered as a “conservation equivalent” to a moratorium on the basis that there will be no mortality of female horseshoe crabs, nor impacts to juvenile crabs. Allowing dredging, as a mechanism for male harvest, is not responsible or protective since dredging practices surely injure and kill adult female crabs, juvenile horseshoe crabs, and other benthic megafauna of which the crabs rely on for food. Numerous scientific papers indicate the negative impacts of both scallop and tooth bar dredging techniques. Mortality rates are not only high for bycatch species but also for species that are left behind and not taken up in the dredging net as bycatch. For example, results of a 2001 study indicate that the majority of damage done to large benthic invertebrates during scallop dredging occurs unobserved on the seabed, rather than in the bycatch<sup>1</sup>. DNREC has no way of knowing how many female crabs and juvenile crabs are injured or killed during routine dredging for male crabs, nor has it provided any evidence in this rule proposal that it has studied, evaluated or considered such impacts. Studies have shown that mortality rates on the bay bottom behind dredging operations can be so immense that fast moving opportunistic scavenger species move into the dredged areas to feed on the dead left behind<sup>2</sup>. Changes in community composition can be lasting. Furthermore, of the fishing gears currently used, toothed scallop dredges that dig into the substrate, may be amongst the most damaging.<sup>3</sup> This detrimental tooth bar technique is what crabbers use in the Delaware Bay to catch horseshoe crabs. In this same study, researchers found that of two crab species studied, *Cancer pagurus* and *Liocarcinus* spp., the proportion of crushed or dead animals left behind the dredge on the seabed was nearly twice as high as in the bycatch. Note that the study indicates that not only are small benthic invertebrates injured but crabs like *Cancer pagurus*, with adult sizes of 25 cm and 3 kg are injured and killed by dredging practices.

In the absence of the ability to predict the effects and impacts of the proposed male only harvest on the recovery of the horseshoe crab (noting the Virginia Tech study estimating that 60-80% of the biomass of the Delaware Bay population was removed by overfishing in the late 1980’s-mid 1990’s) to levels necessary to support the migratory shorebirds, DNREC cannot responsibly adopt this proposal.

The male only proposal directly contradicts the risk averse policy positions of the ASMFC and DNREC to date, and places the Red Knot at greater risk given its endangered status. As the endangered status of a population becomes more dire, management decisions become more dangerous – the relative risk increases. We urge DNREC to continue to pursue an extremely risk averse strategy which can only be defined as a moratorium on the harvest of horseshoe crabs.

In closing, we commend both Secretary Hughes and DNREC for acting in recognition of these irreplaceable ecological relationships along Delaware Bay, and showing strong leadership in securing protection of these resources for this and future generations.

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<sup>1</sup> Impact of scallop dredging on benthic megafauna: a comparison of damage levels in captured and non-captured organisms. Jenkins, S.R., B.D. Beukers-Stewart, A.R. Brand. University of Liverpool. Marine Ecology Progress Series. Vol 215: 297-301. 2001.

<sup>2</sup> Changes in megafaunal benthic communities in different habitats after trawling disturbance. Kaiser, M.J., D.B. Edwards, P.J. Armstrong, K. Radford, N.E. L. Lough, R.P. Flatt, and H.D. Jones. ICES Journal of Marine Science, 55:353-361. 1998.

<sup>3</sup> Dayton, et al. 1995, Collie et.al. 2000)

Sincerely,

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On behalf of:

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