Delaware Bay Horseshoe Crabs are Thriving!

By Carl N. Shuster Jr.

Half a century ago, Rachel Carson's books – The Sea Around Us and The Edge of the Sea – were recommended readings for aspiring marine biologists. Birds were not the subject of The Edge of the Sea; she did comment on horseshoe crabs.

If Carson had written about the migratory shorebirds she might have remarked that:

- the bird's relationship with horseshoe crabs is ephemeral.
- the shorebirds can feed and thrive on small mollusks, crustaceans, and worms.
- the switch to the abundant horseshoe crab eggs on Delaware Bay shores by the birds was potentially detrimental – that dependence upon a sole source can be an ecological dead end?
- the geologic scene keeps changing – so much so that Delaware Bay is only a few thousand years old and probably will disappear within another few thousand years.

She could have also noted that:

- the horseshoe crab is a persistent survivor because it is an ecological generalist.
- there are no fossils of the four living species.
- the closest fossil relative to the American horseshoe crab is 80 million years old;
- horseshoe crabs mature in about 10 years.
- adult crabs may live another 10 years.
- until upwards of ten year classes are decimated, or survive, there probably will be no significant change in crab numbers in a population as extensive as that in the Delaware Bay area.
- the Delaware Bay population survived the loss of over a million a year for 70 years during the century that they were converted to fertilizer from a high of over 4 million harvested in the 1870's.
- the crabs increased within two decades, to over one million spawning on the shores of Delaware Bay in 1990. [*1990 was also a year in which there were only 45,000 red knots -- after a peak of about 90,000 the previous year (Larry Niles:* Conserve Wildlife Summer/Fall 2002, Endangered Species and Nongame Species, NJ Dept. of Environmental Protection). Incidentally, Niles's graph for the years 1986 through 2002 does not show that red knots exceeded 150,000 in the 1980's.]

We can be confident about the survival of horseshoe crabs in Delaware Bay because there have been numerous harvest and scientific reports beginning in the mid-1800's. A similar background on the migratory shorebirds is nonexistent. Indeed, ornithologists did not begin to study the bird/crab relationship until the 1980's, after both crabs and birds had been markedly increasing for more than a decade after the close of the Delaware Bay crab fertilizer industry in 1970.

The record of horseshoe crabs contradicts the untruthful comments by environmentalists, birders, and the media on the plight of the horseshoe crabs in Delaware Bay:

- At no time has that population ever been decimated to a level that could be considered a pending crisis. Indeed, the population is larger now than it was in the 1950's.
- After a 50% drop in spawning numbers in 1992, the crab population of the Delaware Bay area has been relatively stable. Although these numbers are still much greater than those seen in the 1950's and 1960's, the decrease was erroneously touted as a crab crisis.
- the numbers of HSCs and birds in the 1950's and 1960's was so unremarkable that no one bothered to count the numbers of shorebirds.

- If the media and environmental protagonists keep misrepresenting the fate of the horseshoe crab, can we be sure of what they are they telling us about the migratory shorebirds?

Have the environmental protagonists explained that the weather controls the movements of the horse crabs; to such an extent that it can dictate the success of the birds during their stop-over at the bay? Cold and stormy weather prevents the crabs from spawning. If that happens, as it did part of the time this year, the birds cannot benefit from the quantities of the eggs available later on in the season. Unfortunately for the birds, their arrivals are not always in sync with the coming of the horseshoe crabs -- and this is not uncommon.

A large sanctuary (over twice the area of Delaware Bay) that was established in 2001 in federal waters, is the key to the ultimate survival of migratory shorebirds in the Delaware Bay area -- by prohibiting the harvesting of horseshoe crabs on the continental shelf where a large proportion of the horseshoe crabs that spawn in Delaware Bay mature. Controls on the harvest of the horseshoe crab, enacted by the states of Delaware, Maryland, and New Jersey, further prohibit the taking of horseshoe crabs: by a moratorium on the harvest of horseshoe crabs during the migratory bird stop-over each year and by a severe cap on the harvesting of the crabs afterwards.

However, all of these regulations, prohibiting the harvesting of horseshoe crabs, are not necessary to protect the crabs – the sole purpose of the regulations is to enhance the opportunities for survival of the migratory shorebirds. This has created an unusual fisheries management program, one that should be receiving kudos instead of adverse criticism.

The best current judgment is that no further tinkering with management regulations is needed. It is time to let the crabs and Mother Nature resolve the local migratory bird problem.

Carl Shuster is an Adjunct Professor at the Virginia Institute/School of Marine Science, The College of William & Mary. He is a leader in understanding the natural history of horseshoe crabs. In recognition of his contributions, the sanctuary off the mouth of Delaware Bay was named the Carl N. Shuster Jr. Horseshoe Crab Reserve in 2001. In addition, he serves on the Atlantic States Marine Fisheries Commission (AFMSC), Horseshoe Crab Technical Committee.