

To: Department of Commerce, NOAA; attn. Thomas Street

From: Brian Harrington, Sr. Scientist, Manomet Center for Conservation Sciences, Manomet, MA 02345. Tel. 508-224-6521.

29 May 2008

Re: Appeal by G. Walter Swain (Mispillion Lighthouse Marina)

Since 1980, I have been researching Red Knots and their migrations that stretch from Argentina to the Canadian Arctic, including extensive fieldwork on Delaware Bay. Delaware Bay is a major Spring migration staging site for the species (Harrington 2001), hosting perhaps 80% of the entire North American race (*Calidris canutus rufa*). This was a major impetus for formation of the Western Hemisphere Shorebird Reserve in 1986, with Delaware Bay being the first reserve in a network now encompassing 55 locations in 7 nations and 20 million acres of habitat. Over the years since 1980 I have watched the pattern of knot distribution on Delaware Bay shifting, generally from the New Jersey side of the Bay to the Delaware side of the Bay, and especially to the Mispillion River section Delaware. Today this small section of the Bay appears to be key to the welfare of North American Red Knot populations.

Two important issues are involved with regard to the proposed marina at Mispillion Lighthouse. First, the sandbars and beachheads formed at the confluence of Cedar Creek and the Mispillion River have some of the highest densities of nesting Horseshoe Crabs on Delaware Bay. This, in turn, attracts tens of thousands of migratory shorebirds who eat the eggs - especially Red Knots (*Calidris canutus*) but also high numbers of Sanderlings, Ruddy Turnstones, and Semipalmated Sandpipers. This is a constricted location where boats pass close to the channel-side beaches, and where knots and the other shorebirds are potentially exposed to high levels of chronic disturbance. Expansion of boating facilities in the waterways will greatly increase disturbance levels during a life history phase of the knots when they must rapidly gain energy needed for nonstop flights between Delaware Bay and their Middle and High Arctic breeding grounds.

The effect of disturbance to shorebirds is lost foraging time and consumption of energy used in escape flights. Knots are unusually wary shorebirds, quickly taking flight when people approach within a hundred meters. Regarding energetics, flushed knots typically fly between $\frac{1}{2}$ and 1 km away from the source of disturbance. At many locations they are disturbed a dozen or more times each hour. With information on

disturbance frequencies and flight costs (following protocols of Pennicuick, 1989), we modeled how disturbance may affect knots at migration staging sites. In situations where knots require heavy fat loads, such as at migration staging sites, the costs of escaping from chronic disturbance can substantially impair the birds' abilities to acquire fat need for their upcoming flights, in this case nonstop flights to northern Canada. Circumstantial evidence suggests that high levels of disturbance can substantially increase mortality of shorebirds (Pfister et al. 1998).

In summary, Delaware Bay, especially the Mispillion Estuary, is clearly an important -probably essential-- link in knots' (and other shorebirds') annual chain of migration. Anything weakening that link will affect populations throughout Atlantic regions of North and South America as well as Arctic breeding areas. If the proposed marina is developed, then strict orders of condition for shorebirds should be required. Conditions should include:

- seasonal closure between 15 May and 10 June, and
- zero impact to key intertidal breeding habitats of horseshoe crabs

Thank you for your consideration.

Literature Cited.

Harrington, B. A. 2001. Red Knot (*Calidris canutus*). In *The Birds of North America*, No. 563 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA., 31 pp.

Pennycuick, C. J. 1989. *Bird flight performance: a practical calculation manual*. Oxford U. Press. 153 pp.

Pfister, C., M. J. Kasprzyk, and B. A. Harrington. 1998. Body fat levels and annual return in migrating Semipalmated Sandpipers. *Auk* 115: 904-915.