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MA Wildlife Natural Heritage and Endangered Species Program
MassWildlife Field Headquarters
1 Rabbit Hill Road, Westborough, MA 01581

July 11, 2023

Dear Massachusetts Natural Heritage and Endangered Species Program Staff:

I am writing to help inform your process toward possible listing of the American Horseshoe Crab (*Limulus polyphemus*) as a Special Concern Species under the Massachusetts Endangered Species Act. Please accept this short letter as preliminary findings in Manomet's early efforts to recognize and study the value of horseshoe crab eggs as a food resource for shorebirds in Massachusetts and New England.

Background:

Manomet Staff is working diligently to reverse current, steep, negative trends for many North American shorebirds, including several species found in Massachusetts. We are working on many conservation issues involving shorebird habitat and food resources throughout North, Central, and South America, and think that understanding and protecting the food resources for these birds is paramount to stabilizing the populations everywhere shorebirds travel. Red Knot, Hudsonian Godwit, Whimbrel, Semipalmated Sandpiper, and Ruddy Turnstone are of particular focus for us in Massachusetts as these birds move through and stopover in the state on their extensive migrations.

For the most recent conditions of many shorebird populations, please see a recent paper lead by our partners in Environment and Climate Change Canada, **Accelerating declines of North America's shorebirds signal the need for urgent conservation action** (<https://academic.oup.com/condor/article/125/2/duad003/7031074>). We want to engage and work diligently with states, provinces, and countries throughout the full life-cycle migrations of these birds to stabilize and eventually reverse these plummeting populations. We hope you can join us in this monumental effort. Including the horseshoe crab on your list of Species of Special Concern can be a first step in this effort.

I have heard recently that conventional wisdom among Massachusetts coastal interests, including some in state government positions, and even independent scientists suggests that horseshoe crab eggs are not important to shorebirds as a food resource in Massachusetts. From what we know about shorebirds, and the importance of horseshoe crab eggs to shorebirds in other states along the Atlantic, this dismissal of biological values seemed odd. Now, after what we have observed over the past two spring seasons, with additional observations over the last decade, I would like to dispute this belief to say that the eggs of horseshoe crabs appear to be at minimum, an important food resource for several species of migrating shorebirds in Massachusetts. We have documented enough to launch into a much more comprehensive inquiry assessing the value of horseshoe crab eggs to shorebirds in this state.

Our Initial Findings:

In early June, 2022, we were assisting with an international shorebird survey (ISS) on the Monomoy NWR under a USFWS Special Use Permit, and found what we estimated to be 800 Ruddy Turnstones (*Arenaria interpres*) in the vicinity of Minimoy Island on the western flank of the NWR. The birds were clearly feeding on horseshoe crab eggs along exposed bars and intertidal margins of dry sand areas. Turnstones are somewhat unique among shorebirds in their ability to excavate horseshoe crab egg clusters in dry sands, well above the saturated sediments of neap-tidal inundation that tends to limit

other species from accessing the eggs. Telltale indications of turnstones feeding on buried eggs include focal digging spots that are distributed across beach margins in a pattern that is apparently related both egg cluster density and conspecific aggression between the turnstones. The digging and flinging of sand dislodges the eggs from the top section of the egg chamber creating feeding opportunity for the turnstones and other shorebirds such as Sanderling, Red Knot, and Semipalmated Sandpiper to name a few. Please see photos 1 - 5 below for images of this feeding activity.

Based on the 2022 observation of Turnstones, we again conducted ISS surveys on Monomoy NWR on May 23, 2023 and June 1 under Brian Harrington's Special Use Permit (SUP), but due to weather conditions, and neap tides on our May trip, we were restricted to visiting the intertidal flats and margins associated with the west side of North Monomoy only. We witnessed a mini feeding frenzy there during our survey on incoming tide. Photos are included in the following pages of this letter. We estimated that 1,200 Ruddy Turnstones, 700 Dunlin, 265 Red Knots, 400 Sanderlings, and about 120 Black-bellied Plovers were all feeding on horseshoe crab eggs on N Monomoy from the spawning events of the previous days and nights. So, we calculated approximately 2,685 shorebirds in this northern section of the refuge when on this day. We speculated that doubling or even tripling the N Monomoy estimate might be more indicative of number of shorebirds we would find on the entire refuge on that date.

Of additional interest to us has been observing shorebirds on southbound migration later in the summer also feeding on horseshoe crab eggs. The long bills of godwit species, both Hudsonian and Marbled exhibit the most visual evidence of this behavior when they stand in one location for minutes at a time probing repeatedly in "sowing machine" style in saturated sediments. Photos of this are also included in this letter. The following list is species of birds we observed feeding on horseshoe crab eggs in 1) spring migration, and 2) southbound or fall migration.

1) Spring 2022-2023 Observations

- Red Knot
- Ruddy Turnstone
- Dunlin
- Sanderling
- Semipalmated Sandpiper
- Short-billed Dowitcher
- Pintail
- Black Duck
- Mallard
- Bonaparte's Gull
- Ring-billed Gull
- Laughing Gull

2) Fall observations 2015-2022

- Hudsonian Godwit
- Marbled Godwit
- Bar-tailed Godwit
- Short-billed Dowitcher
- Ruddy Turnstone
- Sanderling
- Semipalmated Sandpiper



Image 1. Ruddy Turnstones feeding on horseshoe crab eggs buried in an exposed sandbar on North Monomoy Island, Barnstable County, Massachusetts, May 23, 2023. Photo by Brad winn, Manomet.



Image 2. Horseshoe crab egg chambers excavated by Ruddy Turnstones on North Monomoy Island, Barnstable MA. Photo by Brad Winn, Manomet, May 23, 2023.



Image 3. Horseshoe crab egg chamber excavated by Ruddy Turnstones on North Monomoy Island, Barnstable MA. Photo by Brad Winn, Manomet, May 23, 2023.



Image 4. Horseshoe crab spawning site on an embryonic dune on North Monomoy Island, Barnstable County MA. Some egg chambers excavated by staging Ruddy Turnstones on migration to Arctic nesting areas. Photo by Brad Winn, Manomet, May 23, 2023.



Image 5. Horseshoe crab egg chamber excavated by Ruddy Turnstones on North Monomoy Island, Barnstable MA. Photo by Brad Winn, Manomet, May 23, 2023.



Image 6. Part of our 265 Red Knot estimate on North Monomoy. Photo by Brad Winn, Manomet, May23 2023.



Image 7. Red Knot, Short-billed Dowitcher, Sanderling, Eastern Willet, Semipalmated Sandpiper, and Laughing Gull, exhibiting feeding behavior consistent with a horseshoe crab spawning location on an intertidal bar, Monomoy NWR. Photo by Brad Winn, Manomet, July 20, 2018.



Images 8 and 9. Hudsonian Godwit (*Limosa haemastica*) post-breeding migration stopover, feeding on horseshoe crab eggs with an attendant Sanderling, Monomoy NWR, Cape Cod MA. Photo by Brad Winn, Manomet, August 5, 2018. Egg visible mid-mandible in both photos.



Images 10 and 11. Hudsonian Godwit (*Limosa haemastica*) post-breeding migration stopover, feeding on horseshoe crab eggs, Monomoy NWR, Cape Cod MA. Photos by Brad Winn, Manomet, August 17, 2017. Egg visible in air above bill in first photo and two eggs in bill tip in second photo.



Images 12 and 13. Hudsonian Godwit (*Limosa haemastica*) post-breeding migration stopover, feeding on horseshoe crab eggs, Monomoy NWR, Cape Cod MA. Photos by Brad Winn, Manomet, August 17, 2017. Egg visible near bill tip in first photo and three eggs cradled in mandible prior to ingestion in second photo. Godwit had persistent sanderlings and/or Ruddy Turnstones as kleptoparasites, gleaning or stealing HSC eggs extracted by the godwit.

In summary, Manomet shorebird staff are in the preliminary stages of a broader study involving food resources for shorebirds in eastern Massachusetts, with the shorebird use of horseshoe crab eggs, fiddler crabs for Whimbrel, and ongoing eDNA analysis of Red Knot foods, as our current focal research. We intend to elevate and broaden our understanding of horseshoe crabs and their eggs as food resources for shorebirds in Massachusetts.

From what we have observed and photographed; we believe that horseshoe crab eggs are an important food resource for migrating shorebirds during their northbound stopover period in May and early June, and during the southbound stopover in July and August. We think that restoring horseshoe crab populations throughout eastern Massachusetts in both geographic scope and overall population levels is a prudent and risk averse measure to help improve the survival of rapidly declining Atlantic Flyway shorebirds populations dependent on our shores. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Brad Winn', with a stylized, flowing script.

Brad Winn
Vice President, Resilient Habitats

CC:
Alan Kneidel
Liana DiNunzio
Tim Simmons
Mark Faherty
Stephanie Koch
Eileen McGourty
John Herbert