

April 30, 2015

Dr. Megan Tyrell
North Atlantic LCC Coordinator
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035

**Re: Performance Report – 04/30/2015
F14AP00174**

Dear Megan:

Below is a detailed report highlighting the progress we have made on the above-referenced project as of April 30, 2015. Please do not hesitate to contact me to discuss any of the material provided here.

Sincerely,



Brooke Maslo, Ph.D.
Assistant Professor

**PROTECTION OF CRITICAL BEACH-NESTING BIRD HABITATS IN THE WAKE
OF SEVER COASTAL STORMS
Interim Progress Report
April 30, 2015**

Tasks Completed This Period

Task 2: Quantify Changes in Habitat Resulting from Superstorm Sandy (April 2014 – August 2014)

Completed. We have finished the pre- and post-Sandy species distribution models for our 4 target species, including piping plover, least tern, American oystercatcher, and black skimmer. Since the last interim progress report, we have modified some of the model input variables to better represent the probability of occurrence of species in the coastal landscape. Importantly, we added to our model a data layer delineating management zones on the beach, which are defined as:

- 0 = CLOSED - closed to public during nesting season
- 1 = SPECIES PROTECTION ZONE – open to public use, but high level of proactive protection to birds and habitat in the form of no-rake zones, no-vehicle designations, no dogs, and typically pre-fenced
- 2 = SPECIES PRECAUTIONARY ZONE – open to public, some level of protection for species in the form of no-rake and no-vehicle zones (March 15 – July 15), but lifted if no birds colonize, no typically pre-fenced
- 3 = RECREATION ZONE – no protection for species unless they colonize the site

After re-running our models, model fit increased modestly, with ‘management zone’ being an important predictor of species occurrence, particularly for piping plovers. The new post-Sandy projections reported that Hurricane Sandy resulted only in the creation of 17 ha of habitat (previously reported as 200 ha). The majority of this new habitat occurred in areas that were already managed, indicating that piping plovers are critically dependent upon management practices. More importantly, the results suggest that severe storms will have no measureable habitat benefit to beach-nesting bird species unless we manage appropriately.

Given this insight, we then ran 2 additional post-Sandy models for each target species, replacing the ‘management zone’ layer with a new layer converting all management zones to 1) species protection zones, and 2) species precautionary zones. This is equivalent to setting a condition where all beach areas were available species management. If we view the beach landscape as a “blank slate,” then Hurricane Sandy created 272 ha and 265 ha of habitat in Scenarios 1 and 2, respectively (Figure 1).

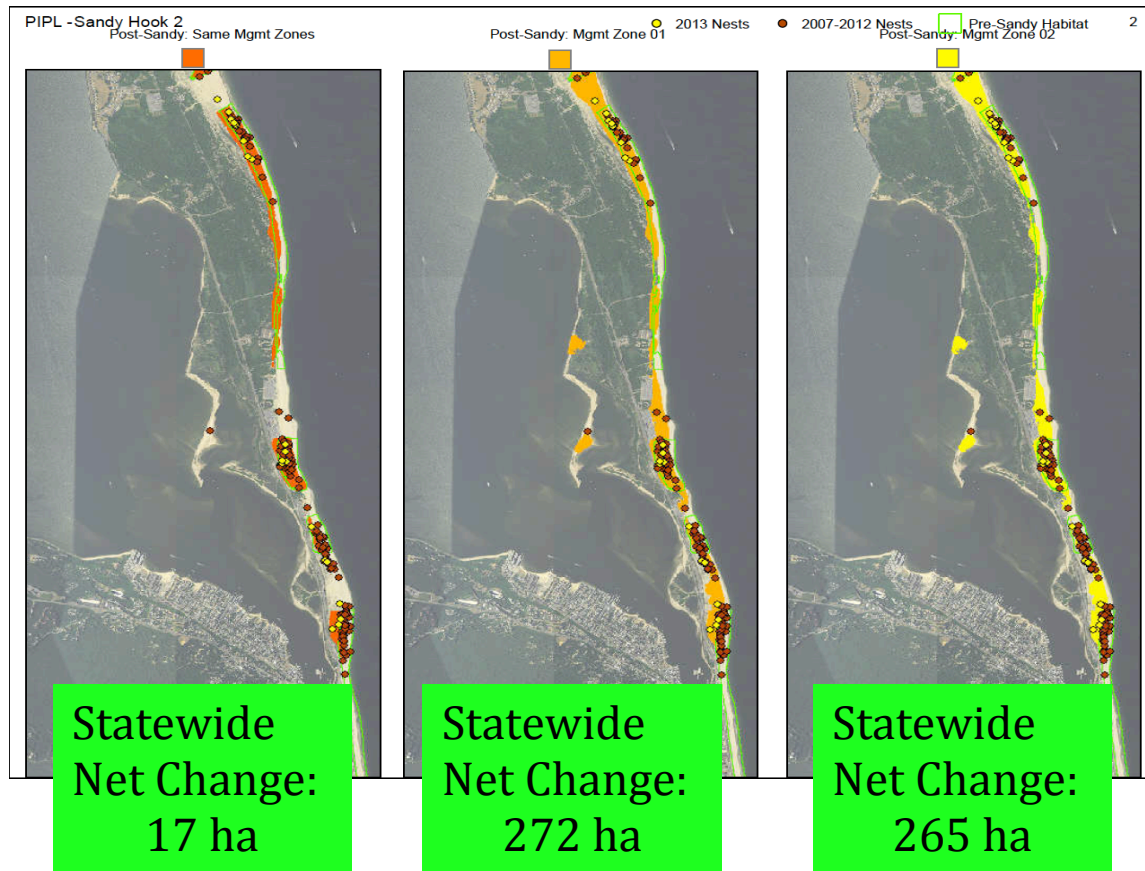


Figure 1. Net increase in piping plover habitat resulting from Hurricane Sandy. If no changes in current management zones occur, the net increase was 17 ha. If all beaches are considered 1) species protection zones, or 2) species precautionary zones, the New Jersey experienced a net increase of 272 ha and 265 ha, respectively. Yellow and red dots indicated piping plover nest locations in 2013 and 2014, respectively.

Task 3: Evaluation of Storm Recovery Impacts on BNB Habitat (April – September 2015)

80% Completed. We have received the 2014 nest monitoring data for our target species and have mapped it on our post-Sandy model outputs. We are currently cataloguing occupancy of target species on newly created habitat areas, and we are attempting to quantify how much potentially suitable habitat was impacted by anthropogenic recovery actions.

New Application of Work: After presenting our work at the NJ Piping Plover Cooperators meeting, we were asked by the USFWS NJ Field Office to provide habitat maps for 3 municipalities that were receiving beach fills this year. The maps will be used to locate “set-aside” areas for beach-nesting bird species. Given the usefulness of our maps for identifying areas to protect, we are now preparing maps for each municipality and will present this to the NJ Endangered and Nongame Species Program and the USFWS NJ Field Office for their use. We are very happy that our work is being applied for this purpose.

Youth and Veteran Involvement

We are continuing to employ part-time a female, minority youth, who is assisting PI-Maslo in the generation of models and maps.