Role of Beach Coastal Features on Black Skimmer Reproductive Success

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Introduction

- The Black Skimmer: a migratory colonial waterbird, breeds along NY and NJ coasts.
- Nests with Common Tern and Least Tern.
- It is recognized by the DEC as a Species of Special Concern.
- We hypothesized that if beaches maintain certain coastal features such as vegetative cover and dune formation, then those areas will see the largest numbers of Black Skimmer productivity and site fidelity because they would offer the most ideal available nesting habitat.

Figure 1. A Black Skimmer nested with its fledgling. Photo by Photomatt28

Methods and Materials

- Utilized Long Island Colonial Waterbird and Piping Plover (LICWPP) Survey data to create graphs of total annual population and number of Black Skimmer colonies
- Utilized Google Earth to create a habitat assessment map: pinned locations from 1985-2020 in decade intervals
  - Calculated percentage of vegetative cover
  - Identified and analyzed certain topographic features such as dune formation and groin placement

HYPOTHESIS: if beaches maintain certain coastal features (vegetative cover and dune formation), then those areas will see the largest numbers of black skimmer productivity and site fidelity because they would offer the most ideal available nesting habitat.

Results

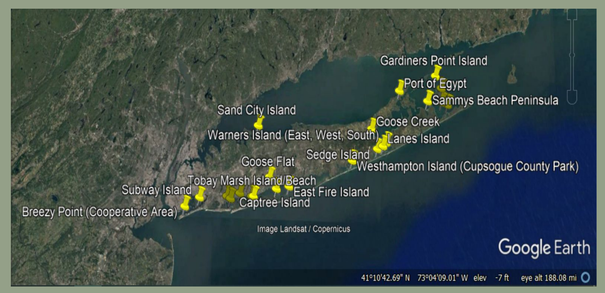

Figure 2. Using the black skimmer 1985-2020 data provided by the DEC, we utilized Google Earth and plotted pins of all locations that were used for breeding. this is from the time period 1985-1994.

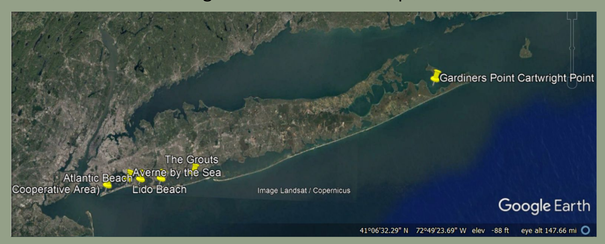

Figure 3. These locations were from the most recent decade of recorded data: 2005-2015. There is a significant reduction in available nesting habitats.

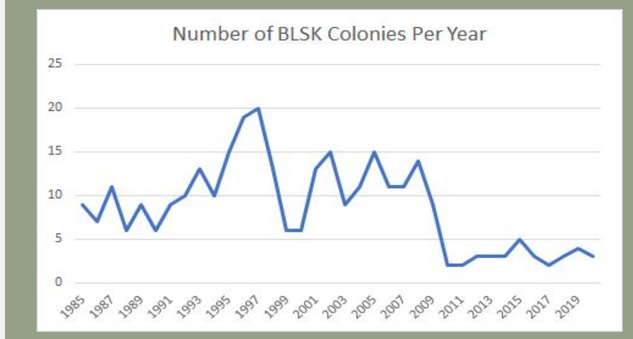

Figure 4. We also graphed the average number of Black Skimmer colonies per year using a line graph. This was done by taking the total number of breeding pairs and dividing it by the years.

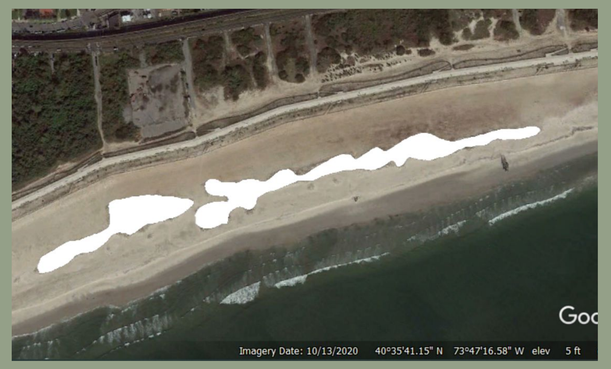

Figure 5. Boundary drawing of the vegetative cover of Arverne by the Sea done by using the polygon feature on Google Earth.

- Out of 50 breeding locations, chose four to focus on: Atlantic Beach, Arverne by the Sea, Breezy Point, Lido/Nickerson Beach.
- % of vegetative cover (calculated beach cover first):
  - Atlantic: 3.92%
  - Arverne: 7.03%
  - Breezy Point: 20.64%
  - Lido/Nickerson: 26.92%

Figure 6. Analysis of certain topographic feature and measurements of beach features. Pictured here is Arverne by the Sea.

- Blue: boardwalks
- White: fencing/enclosures
- Purple: Mean High Water (MHW)
- Green: dunes
- Orange: groins
- Yellow: beach width
- Pink: distance from primary dune crest and MHW
- Aqua: intertidal distance

Discussion

- % of vegetative cover is consistent with ideal Black Skimmer ideal sites: 20% or less vegetative cover.
- Groins help reduce erosion and enclosures/boardwalks reduce human disturbance while Black Skimmers nest in the foredune.
- Black Skimmer migrated to Arverne after a beach widening project, which made the area more favorable, making the location more suitable for the Skimmers
- Not lack of habitat, but rather quality of habitat, a distinction from our original hypothesis.
- Conservativation status of the black skimmer should be labeled as endangered rather than species of special concern

Future Steps

In the future, we would like to analyze survey data of other predators to see if there's a correlation between high productivity with black skimmers and the decline of predatory species. In addition, because of the high productivity at Jones Beach, we would have liked to study that area. We did not find all of the surveys that could have increased our collection of data

Acknowledgments

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