Investigating The Diet Of The Piping Plover (*Charadrius melodus)*

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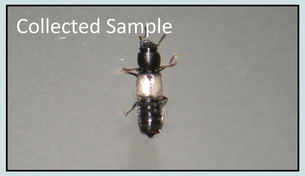
Introduction

Relatively little is know about the diet of the Piping Plover. DNA barcoding is a process that will be used in order to discover more about what the Piping Plover eats. DNA barcoding allows scientists to accurately identify invertebrate species. Using this tool, locating and protecting nesting sites will be achievable . Their nests are frequently abandoned when percieved threats, like humans are near. Our goal is to reduce the amount of abandoned nests and increase the Piping Plover population.

Ephemeral Pools

An ephemeral pool is the desired breeding ground for Piping Plovers. One goal of this project is to perfectly desingn an environment where suitable cover is present for the birds and where food is abundant. An ephemeral pool contains a sandy dune followed by a wetland that contains various invertebrates. It is the perfect habitat for the Piping Plover.



Bledius subterraneus

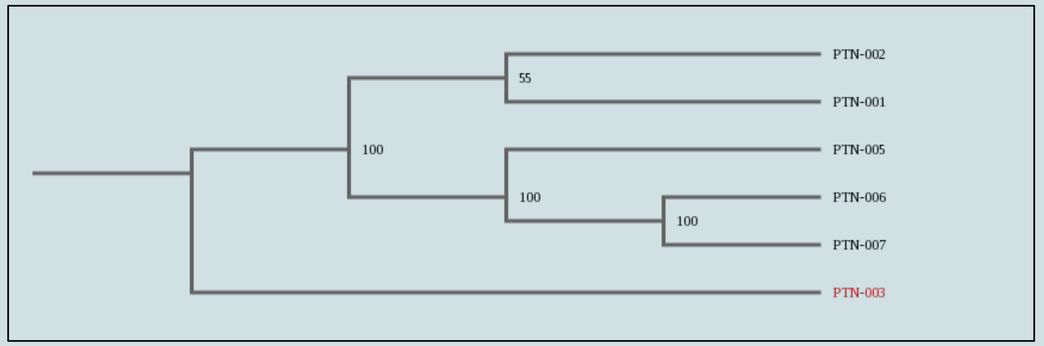
Ceratopogonidae

Leucophenga nigriventris

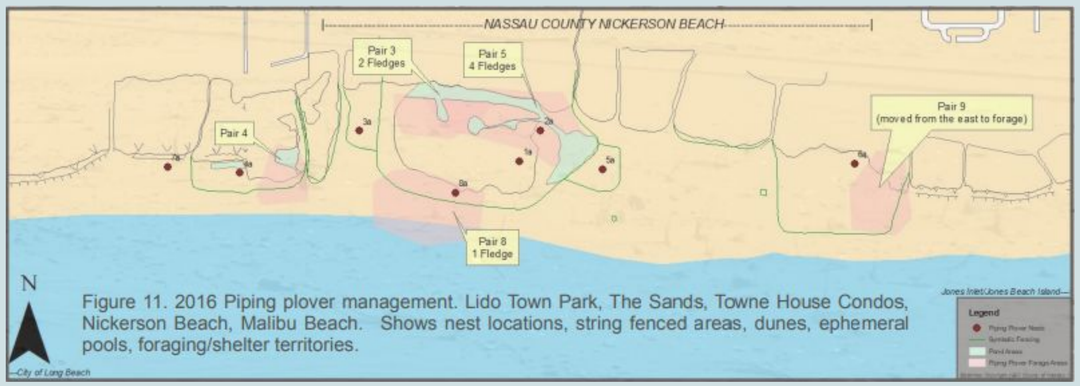
Chick

Juvenile

Adult



This phylogenetic tree displays the genetic links between the invertebrate samples.



This map shows the man-made ephemeral pools that have been maintained by the Town Of Heampstead for over a decade. Image from Dr. James Brown, TOH.

Materials/Methods

- Identify samples of invertebrates that are most likely fed upon by piping plovers and have been collected from successfully maintained (ephemeral wetland) nesting areas.
- Taxonomically ID species. - Follow barcode LI protocol for identifying species if they are unable to be identified using taxonomic keys.
- First, the DNA will be isolated by using the rapid DNA isolation process incorporated with previous barcode methods. It starts off by grinding up the sample in a lysis solution to break up the cells. To isolate the DNA, a paper disk is added, which soaks up the DNA.
- Now with the DNA isolated, it can be amplified by PCR. In this process, a primer mix will be combined with the DNA. After that, it is put it in a thermal cycler to be amplifed.
- When the amplifying process finishes, gel electrophoresis will be used to analyze the DNA. The final step is to sequence the PCR product to further analyze the bioinformatics.