

Working for Great Pond Foundation has been an incredible experience. Working with and learning about some of the environmental non-profit organizations on the island has been inspiring. This past summer I learned that things do not always go as planned, biology is not always predictable, to have patience, and crows are intelligent menaces.

Shellfish restoration efforts were conducted by Martha's Vineyard Shellfish Group. Oyster Restoration efforts consisted of increasing the overall oyster population by reintroducing oysters into parts of the pond where historically they were not found. This was done by adding a hard substrate (shells) to the pond's floor, using oyster cages and buoy lines to influence the reproduction process of oysters and to catch spat throughout the water column. Mature oysters are placed in oyster cages to increase the amount of spat (baby oysters) caught on the shell bags around the pond. Oysters rely on warmer water temperatures to stimulate reproduction meaning that the oysters in the cages will spat first and increase the amount of spat throughout the water column. Oysters prefer brackish water to reproduce and can grow better in high salinity waters.

Edgartown Shellfish Warden and Martha's Vineyard Shellfish Group (MVSG) employee, Petie Jackson was not only able to educate us on the oyster restoration efforts of Edgartown Great Pond but shellfish restoration efforts around the island. There were times when we visited the shellfish hatchery on Chappaquiddick to maintain the tanks full of immature quahogs and learned more about the nursing process. Sengekontacket is home to one tidal upweller. A tidal upweller is a large chamber where quahogs of different ages are stored in sifting boxes. This allows the food to be evenly distributed among all of the quahogs in the apparatus. MVSG's hatchery in Vineyard Haven helped me learn more about the entire process of growing shellfish. Oysters help clean the Pond by filtering nutrients out of the water. One oyster can filter up to 50 gallons of water a day. However, the process of removing the nutrients from the water system is completed when the oysters are taken out of the pond to be consumed.

Beach Nesting Bird Monitoring efforts included observing threatened species by identifying the birds of concern, identifying predators, and implementing management practices. Piping Plovers and Least Terns are Federally listed as a Threatened species meaning that they are covered under the State and Federal endangered species laws. American Oystercatchers are vulnerable because their nesting habitat is becoming diminished due to degradation from recreational and natural processes. BiodiversityWorks provided training and support throughout the summer. I shadowed the Shorebird Biologists, Liz Baldwin and Angelina Stancampiano, to take over one of her monitoring sites. They were able to show me how to identify the shorebirds of concern, predators and their tracks, how to observe their behavior and how to make sense of it. When nests were discovered, symbolic fencing was placed around the territory to provide a healthy barrier between people and birds. An enclosure was placed around one of the nests towards the center of the beach due to the threat of predators. It was often noted when crows or other predators and their tracks were seen around the nest. Unlike other predators, Crows have the ability to hone in on human cues. It was important to cover up our tracks and take note when crows were around. With this information, we were able to see what predator management practices were needed at the site.

5 mating pairs of Piping Plovers nested on Edgartown Great Pond's Barrier beach, however only 3 mating pairs had successful (hatched) nests and there were no fledglings. Since piping plovers have high nest site fidelity it is likely that these same pairs will return to this beach in the coming years and will have a better chance at fledging their chicks.

Water sampling stations were measured twice a week with a Conductivity, Temperature, and Depth sensor (CTD) and Secchi Disc and nutrient tests were done once a week at each

station. The CTD and Secchi disc were used to measure the pH, salinity, depth, turbidity, dissolved oxygen, and oxidation reduction potential. The photometer measured nitrates, phosphates, silicate, and ammonia. The start of our water sampling efforts was quite interesting. It seemed like 2 out of 4 of our nutrient tests were not working properly because of the chemistry of Edgartown Great Pond. After speaking with customer service many times, we were able to modify the procedure for Nitrates and Ammonia to get accurate readings of our water samples. Even though we cannot use our earlier nitrate data for these tests, it feels good knowing that we have an accurate understanding of the pond and that we can move forward to analyze our data in detail.

Coming into the summer I expected to learn little about a lot. However, looking back I've learned a lot about a little. I learned how to collect, test, and analyze water samples, the importance of shellfish in a body of water and what could be done to assist in their growth, and how to observe and analyze the behavior of wildlife. Data that we've collected can be used in present and future studies to help with conservation. It feels great to know that I am a part of an organization that is interested in the conservation of an ecosystem which can be used or compared to similar places around the world. Being a part of Great Pond Foundation has helped shape me as a field scientist by expanding my knowledge, experiencing new things, and learning new field techniques. Great Pond Foundation's Summer Internship is a great opportunity for anyone looking to go into Environmental Science or Conservation fields.