Protecting Shells and Shores

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Project Motivation & Goals

Turtles are a foundational species in coastal ecosystems, as they regulate other organisms and keep the food web balanced. **Over the past 50 years, population levels of Diamondback Terrapin** (*Malaclemys terrapin*)**, have declined by 75%, across the United States[1].** Of the five New England states with coastline, Connecticut has the third highest population of Diamondback Terrapins.

In Connecticut, the Diamondback Terrapin was listed as a **species of special concern** in 2015 under the state's Endangered Species Act. A species of special concern is a **plant or animal that isn't officially endangered or threatened but is still at risk**. Some of the primary reasons why they are at risk are habitat loss, pollution, and human activity[2]. To this day, the Long Island Sound continues to face environmental impacts that puts these turtles at risk.

My project goals were to:

- ***Identify the main threats to terrapins in Long Island Sound***
- ***Restore local salt marsh areas to improve habitat for Diamondback Terrapins and other wildlife***
- ***Organize and lead a community cleanup event centered on protecting Terrapins and their habitat***

Figure 1. (left) Photo of a Diamondback Terrapin, Malaclemys terrapin.

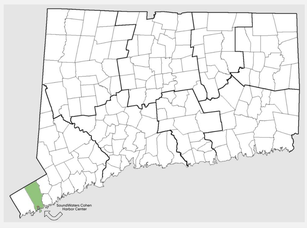


Figure 2. (right) Map of Connecticut highlighting SoundWaters Coastal Education Center in the city of Stamford.

Project Outcomes

Environmental Impact

- **Restoration Plans**: We are preparing to plant native salt marsh grasses to improve water quality, reduce soil erosion, and support local wildlife. These plants will also help protect coastal areas from mass pollution once planted.
- **Research Contribution**: By studying predator and prey relationships, we're learning how pollution and habitat loss affect local species. This research adds to the ongoing work to protect these ecosystems.
- **Data Collection**: The data we've gathered, like species counts and water quality measurements, will be helpful for future conservation.

Social Impact

- **Community Involvement:** Our Community Cleanup Event at West Beach helped bring local people together to address pollution, fostering a sense of shared responsibility for the environment.
- **Education**: Through the cleanup outreach, we raised awareness about the importance of protecting local wildlife and habitats.
- **Collaboration**: Working with Tim Abbott and Katie Boback from SoundWaters gave me expert insights and helped strengthen connections between students, environmentalists, and the local community.

Personal Impact

- **Skills Learned:** This project taught me how to collect and analyze data, use scientific equipment, and conduct field research.
- **New Perspective:** I've gained a deeper understanding of how human actions affect the environment and why conservation is so important.
- **Personal Growth:** The process has helped me grow as a researcher and as someone who is more passionate about protecting the environment.

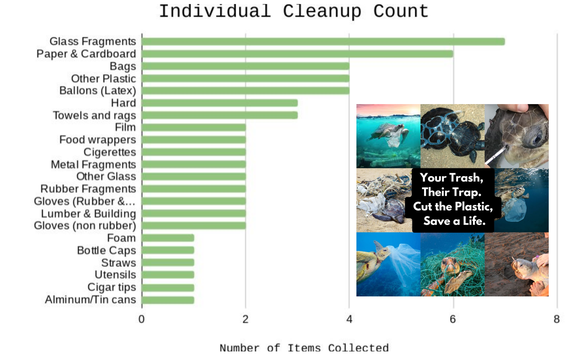


Figure 6. Trash collected and disposed of by myself, Shanelle, and Julianna (volunteer) during the Community Cleanup Event at West Beach on March 9th.

Figure 7. (left) Awareness bucket I designed to collect harmful trash.
Figure 8. (right) Me holding a Diamondback Terrapin.

Methods

Salt Marsh Restoration

- As part of the Soundwaters Research Intensive (SRI), we began planting and growing native salt marsh grasses in January, 2025.
- In February, we started to record data on the native grasses. The data included the height and speed of growth of the grass pods.
- Pods of Smooth Cordgrass (*Spartina alterniflora*) will be planted in May-June.
- We chose Spartina alterniflora because it is a crucial native salt marsh grass, important for shoreline stabilization, breaking up wave energy from storms, and creating habitat.

Figure 3. Stamford salt marsh during February 2025

Equipment Used

- Seed trays & pots for initial growth period
- Grow lights provided consistent light
- Rulers & calipers to measure growth

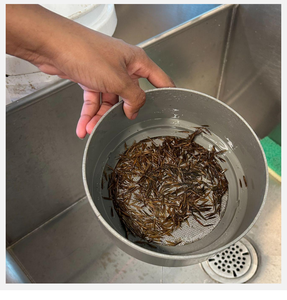
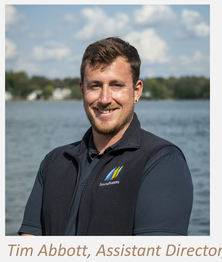


Figure 4. (left) Salt marsh grass seeds

Figure 5. (right) Salt marsh grass pods.

Community Partnership

- My community partners were **Tim Abbott and Katie Boback** from SoundWaters, who taught me research skills through the **SoundWaters Research Intensive Program**.
- The SoundWaters Research Intensive is a program for high school students to gain experience in marine science. Students conduct research on water quality, animal populations, and human impact using professional equipment and learn about climate change's local effects.
- Tim and Katie helped me analyze environmental data, understand threats to creatures along Long Island Sound, and taught me how to identify different organisms such as crabs, plankton, and fish.
- Learning how to recognize these species gave me a clearer idea of how pollution and habitat destruction affect the ecosystem, which helped me choose a focus for the Community Cleanup Event.



Tim Abbott, Assistant Director, High School Programs

Katie Boback, Educator, Extracurricular Program Coordinator

Conclusion and Next Steps

Fragments of plastic bags, glass, and latex balloons made up the majority of beach trash collected during the event at West Beach in Stamford, CT

- Many of these items likely come from single-use products.
- These products not only pollute the coastal environment but also pose major risks to marine life, especially turtles.
- Reducing dependence on single-use products and encouraging proper disposal procedures can significantly contribute to coastal ecosystem conservation and species dependent upon these habitats.
- This project highlights the need for stricter policies towards waste reduction, active public education, and improved individual responsibility.

Moving forward, we must continue collecting data, educating communities, and advocating for stronger policies on plastic reduction.

Acknowledgements and References

I would like to give a huge thank you to my wonderful community partners Tim Abbott and Katie Boback as they've given me guidance for the past seven months. Their expertise and unwavering support have deepened my understanding of environmental science but also inspired me to think critically about the broader implications of environmental conservation. I've learned so much from them. I would also like to thank the NRCA program and my wonderful mentor Shanelle for creating a welcoming space and offering outstanding guidance throughout this nine-month experience. Shanelle, Laura, and Nicole's patience and kindness has meant the world to me and this project wouldn't have happened without them. Thank you to the NRCA for providing me with a stipend to complete this work.

1. Viviano, Meg Walburn. "Go Terps! Push to Protect Diamondback Terrapin as Endangered Species." Chesapeake Bay Magazine, 9 Oct. 2024, www.chesapeakebaymagazine.com/go-terps-push-to-protect-diamondback-terrapin-as-endangered-species/.
2. "Diamondback Terrapin." CT.Gov, 30 Sept. 2015, portal.ct.gov/DEEP/Wildlife/Fact-Sheets/Diamondback-Terrapin.