

2025 Oyster Conservationist Report



2025 Oyster Conservationist Program

FINAL REPORT

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Introduction

Great Bay Estuary (GBE) is an important resource for coastal New Hampshire as well as the Gulf of Maine (GoM). GBE provides many ecological, cultural, and economic benefits to coastal communities. A vital organism to this estuary is the Eastern Oyster (*Crassostrea virginica*). Oysters are ecological powerhouses and provide a slew of benefits such as water quality (by filter feeding), shoreline protection, and habitats for fish and invertebrates (Grabowski and Peterson, 2007).

GBE once had thriving oyster reefs but lost about 90% of the population by historical over-harvesting, sedimentation, disease (Stasse et al., 2022), and invasive species such as green crabs (Pickering et al., 2017). This loss can affect the ecosystem services oysters provide to coastal communities, estuarine ecosystem and economies. To overcome this challenge, TNC partners with the University of New Hampshire's Jackson Estuarine Laboratory (UNH-JEL), NH oyster farmers, and Oyster Conservationist (OC) Volunteers to restore healthy oyster reefs in GBE.

This program started in 2006, and over 327,000 oysters have grown and been deployed on oyster restoration sites in GBE. OC volunteers consist of folks who have water access to the Great Bay watershed, whether that be from personal docks, marinas, moorings, or marshes. Volunteers adopt a cage of spat (baby oysters) on shell for 10 weeks in the summer, typically mid-July to mid-September. The objectives of this program are to engage in oyster restoration efforts, collect important data, contribute to making a difference in GBE, join the oyster loving community, get motivated in conservation work, and experience hands-on learning.

Methods

Recruitment and Training

In 2025, 38 sites hosted oyster cages for the program. The sites were spread throughout the GBE Watershed, including 9 towns: Dover, Durham, Greenland, Newcastle, Newfields, Newington, Newmarket, Portsmouth, and Stratham. One of these sites was designated as a Community Oyster Garden and was hosted by the town of Durham at the Old Town Landing Park. The Community Oyster Garden hosted two cages this year that were open to the public to increase the accessibility of the volunteer program. A new sign was put up as well with information about the program as well as a QR code where people could upload data (Figure 1).



Figure 1. Informational sign at the Durham Town Landing community oyster garden

To maintain effective communication and create a community between volunteers, the Coastal Conservation Coordinator (CCC) sent regular updates as well as other opportunities via email to volunteers, ensuring they received weekly communication. These emails included information about the ongoing restoration season, reminders about data collection, and events/opportunities in the area. A new update to this year's program were monthly educational webinars where each month from July-October, the CCC gave a 15-minute presentation on a relevant topic (Oyster Biology, Aquaculture, Green Crabs, and Advocacy) followed by a 15-minute Q&A session. Attendance was about 5-10 people depending on the webinar, and all presentations were recorded for folks to watch at a later time if they were unable to attend. Throughout the season, and beyond, the CCC remained accessible for any questions, and concerns that may have come up.

Oyster Spat Production

Permitting

The Nature Conservancy acquired the necessary permits for this program from the New Hampshire Fish and Game (MFD 2530) for growing oyster spat at OC sites in accordance with state and shellfish regulations.

Shell Collection and Preparation

At UNH-JEL, approximately 140 oyster cages were filled with recycled oyster shells from the UNH Shell Recycling Program and Coastal Conservation Association in early July 2025. The shell was shoveled into

the cages until they were about half full and were then shaken and rinsed to get rid of excess debris. The filled cages were then placed in 4 remote setting tanks (A, B, C, D) outside JEL and filled with bay water to prepare for the oyster larvae set.

Spat on Shell Production

For spat on shell production for the OC program, 6 million oyster larvae were purchased from Muscongus Bay, a hatchery located in Bremen, ME. These larvae arrived on July 8th, 2025, and were prepared by UNH-JEL partners, Dr. Ray Grizzle and Krystin Ward. The larvae were weighed, examined under a microscope for health, and a subset was measured. After lab processes, the larvae were divided among the four settlement tanks. Over a few days, water quality and spat settlement were monitored. On July 11th, 72-hours after larvae arrival, the larvae settled onto the shell becoming spat or baby oysters. The cages with spat-shell were then transported onto the floating raft adjacent to the UNH-JEL docks.



Figure 2. Oyster larvae from Muscongus Bay being examined under a microscope and placed into settling tanks

Program Delivery

Before OC volunteers received their cages filled with spat-on-shell, spat counting events were held at the Durham Town Landing to get a baseline of spat survival. On July 28th, 29th, 30th, and August 4th, volunteers came out to the Durham Town Landing to count spat. These events were posted on Nature Groupie, and all were welcome. The event on August 4th was a special outreach day where we hosted the Global Seafood Alliance to count spat. Over the course of the season, about 90 people signed up to participate in spat counting events. Each cage had about 40-50 shells, and volunteers had to count the total number of spat on 30 random shells. All cages were labeled with a number and delivered to OCs throughout the week.

The CCC delivered the OC cages to each of the 38 sites, and every OC volunteer received a folder that had a data-sheet for their two collections days, calipers for spat measuring, a copy of the permit, a brush to clean the cage, and informational materials, for example an oyster critter ID booklet. The CCC met with new volunteers during cage drop-off and gave thorough instructions. Some volunteers were given a screw anchor and a buoy if needed.

The Durham Community Garden has a pulley system designed by an Eagle Scout for better cage access, and it is built to hold 4 cages (although only 2 cages were held there this season). Two volunteers maintained this site and collected data from the two cages. All spat counting events before cage drop-off and after cage pickup for the OC program were held here as well.

The OC data collection dates were August 22nd and September 12th. OCs had to count spat on 30 random shells and measure 30 random spat. Throughout the season, OCs monitored biofouling, predators, such as green crabs and oyster drills, and wild recruitment. Starting 9/22, OC cages were picked up from their “homes”, and the last cage was picked up on 9/30. Spat counting events took place during that same week, and any cages not completed at the spat counting events were wrapped up on 10/2. All oysters from the raft and oysters from the OC volunteers were deployed at Woodman Point on 10/22. The OC end of the year volunteer party took place at North Country Hard Cider on 11/12 to present the data and say a huge thank you to all their amazing work!

Results

Initial Spat

The oyster spat for the 2025 season had an initial count at the public spat counting events that took place starting on July 28th. The initial count revealed an overall average of 11.5 spat per shell \pm 18.1 (mean \pm standard deviation). The CCC delivered an estimated total of 13, 797 oyster spat to OC volunteers, a very high number compared to the 2023 and 2024 season.

Growth

Across all sites, the average growth at the end of the OC season was 14.29 \pm 13.34 mm (mean \pm standard deviation), representing the average spat shell length. The final size of spat ranged from 1mm to 65mm, but it is important to note anything <15mm is most likely wild recruitment. For spatial analysis, OC sites were grouped by location (Figure 3). Newmarket exhibited the largest growth, while Portsmouth showed the lowest growth.

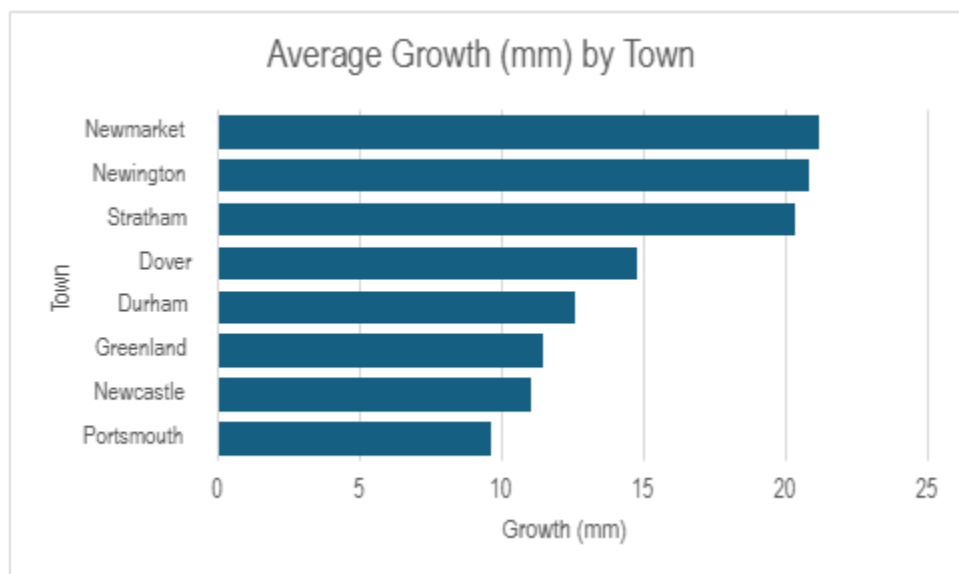


Figure 3. Average oyster spat shell length in mm by town in GBE 2025.

Survival

In July, OC volunteers collectively received an estimated 13,797 oyster spat, and by September, they returned approximately 3,073 oyster spat, resulting in an overall survival rate of only 22%. Because a hand full of shells had over 100+ spat on them, there is not enough space for them all to survive. A good number of spat per shell is about 10 spat per shell (Dr. Ray Grizzle, personal comment). Although the survival rate is low, the number spat in total at the end of the season is still much higher than the past few years, still making it a successful season. Sites with the highest survival rates included the area of Stratham, Newington, and Greenland, whereas Dover and Newcastle were low for survival (Figure 4). Lower survival can be due to predators, excess biofouling, or being exposed at low tide for too long.

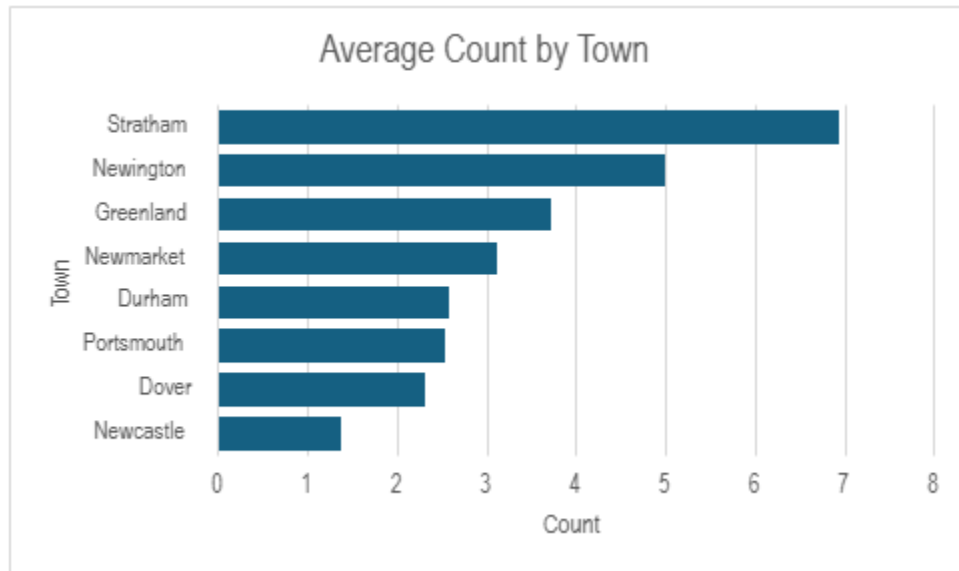


Figure 4. Average oyster spat counts by location in GBE 2025.

Discussion

Overall, the 19th year of the Oyster Conservationist program was a big success! This year's oyster spat did very well, and we deployed over 3,000 oysters at Woodman Point that our volunteers grew throughout the summer and early Fall. The primary objective of the OC Program is to engage the community surrounding GBE watershed as well as folks who don't have water access but still want to be involved. This season, the program had 38 sites, but 41 volunteers, including a few new volunteers! Volunteers included families, individuals, NGOs, and schools. Nine spat counting events took place, including an oyster workshop, as well as coverage by NH PBS, NHPR, and Aquademia Podcast. Many local talks took place as well to provide outreach on this program including the Gundalow Company Science Cafe Series, NH Surfrider Meeting, For Your Consideration at Garrison City, and a UNH Marine Docent meeting. These events not only helped showcase how amazing this program is but also helped recruit a few new volunteers for 2026.

The OC Program made a successful contribution to oyster reef restoration efforts by growing over 3,000 spat. Although survival % was low, the total number of spat at the end of the season was still over 1,000 more for both the 2023 and 2024 season, and the initial number of spat was so high that it is not surprising it went down given that many spat on shell cannot all survive. We are partnering with UNH to

investigate all the data collected since 2006 to help answer these questions that surround oyster spat survival and growth spatially, and temporally.

Over 19 years, the OC Program has contributed over 327,000 live oysters to restore the vital ecosystem services they offer to Great Bay. Through both community engagement and oyster reef restoration efforts, this program continues to prove how vital it is in New Hampshire to help with the health of the GBE watershed. We are looking forward to the 20th season in 2026!

Thank you & Acknowledgments

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References

- Grabowski, J. H., & Peterson, C. H. (2007). Restoring oyster reefs to recover ecosystem services. *Theoretical ecology series*, 4(7), 281-298.
- Pickering, T. R., Poirier, L. A., Barrett, T. J., McKenna, S., Davidson, J., & Quijón, P. A. (2017). Non-indigenous predators threaten ecosystem engineers: interactive effects of green crab and oyster size on American oyster mortality. *Marine Environmental Research*, 127, 24-31.
- Stasse, A., Cheng, M. L., Meyer, K., Bumbera, N., Van Volkom, K., Laferriere, A. M., ... & Brown, B. (2022). Temporal dynamics of eastern oyster larval abundance in Great Bay Estuary, New Hampshire. *Journal of Shellfish Research*, 40(3), 471-478.