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Scaling-Up: A Fifth Year of Restoring Oyster Reefs in Great Bay Estuary, NH 2013 Annual Program Report

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2013 Annual Program Report

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Executive Summary

The eastern oyster (*Crassostrea virginica*) in New Hampshire's Great Bay Estuary has declined in the past decades, with local populations reduced due primarily to disease, excessive siltation, and past over-harvest. The loss of filtering oysters results in diminished ecological benefits for water quality, nitrogen control, and other services that healthy oyster populations provide. In support of management objectives to restore oyster populations, The Nature Conservancy (TNC) and the University of New Hampshire (UNH) have combined for a fifth consecutive year of scaled-up methods to rebuild oyster reefs and populations. Since 2009, we have "planted" seasoned shell, primarily surf-clam and oyster mix, on channel bottom as a hard substrate foundation to recruit spawn from nearby native populations. Constructed areas are amended to supplement recruitment with laboratory-raised and volunteer-grown "spat-on-shell" from remotely set larvae. Following four consecutive years of experience and adaptation, 2013 was a year of unprecedented effort and conservation outcomes. We successfully constructed and seeded five new acres of reef adjacent to native oysters in the Piscataqua River in Dover (1.5 acres) and in the Lamprey River in Newmarket (3.5 acres). Notably, we employed a new shell deployment method to achieve large-scale reef construction. Restoration efforts were greatly enhanced by excellent remote set success and outstanding natural recruitment, resulting in over 2M oysters. In addition, community engagement through the volunteer Oyster Conservationist program reached another all-time high with fifty families producing our largest oyster stock ever for restoration. Over the past five years, our efforts have added over 13 acres and 3M oysters to the ecosystem, increasing native Great Bay Estuary oyster populations by about 10%.

Background

Growing problems with excess nutrients, wastewater and siltation in Great Bay Estuary require a multi-faceted response that includes improved point and nonpoint source controls, stronger advocacy for estuary protection policies, accelerated coastal land conservation, and innovative in-the-water habitat restoration and pollution control strategies. Sustainable populations of our native eastern oyster (*Crassostrea virginica*) are a keystone of the long-term health of the estuary, however by the early 2000s we had lost hundreds of acres of oyster reefs due to disease, excessive silt pollution, and past harvest (see Figure 1 for historic/present reef comparison). Loss of vital services followed. Healthy adult oysters provide significant water quality benefits by each filtering about twenty gallons of water per day. These resilient bivalves serve as the estuary's water purification system, controlling nutrients and clearing suspended solids that are harmful to eelgrass beds. Reef aggregations also provide rich habitat and feeding grounds for estuarine fish and other invertebrates. To recover lost services and return the system to balance, managers now recognize that restoring oysters is one of the best direct actions we can take to improve the overall ecological health of the estuary.

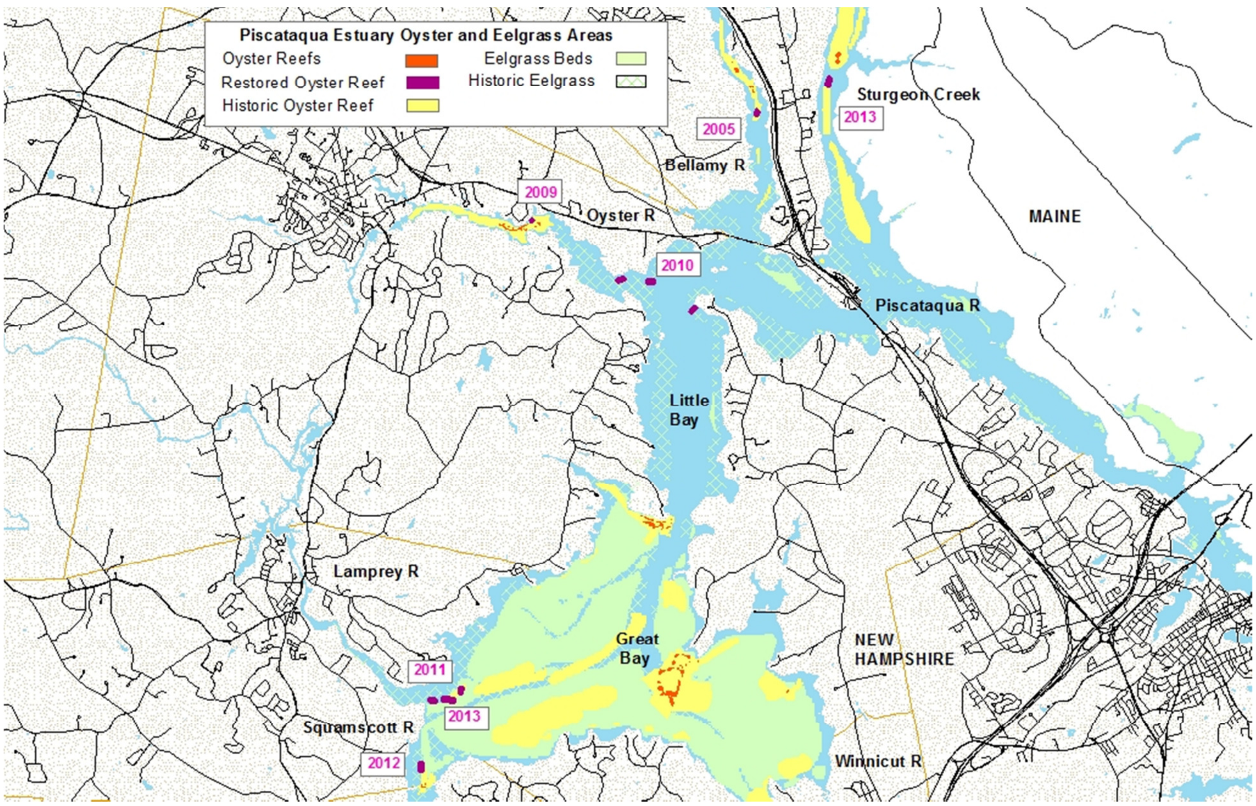

Fig 1. Map of historic NH oyster reefs (circa 1970), current reef, restoration sites, and eelgrass areas

After several years of experimentation by the Grizzle Lab at UNH, TNC and UNH together began to develop methods to restore oyster reefs by “planting” shell on firm channel bottom using primarily surf-clam shell (*Spisula solidissima)* acquired in bulk from a seafood processor. To maximize filtration benefits and to create “spawner sanctuaries”, we work in closed-to-harvest areas in proximity to municipal wastewater outflows.

In 2009, we constructed a pilot 0.2 acre shell reef in the Oyster River (Durham) with 20 yd^3 (~18 tons dry weight) of spread shell seasoned for six months at a local compost site. Spreading was initially done one ton at a time using a spud barge that deployed shell from feed bags swung on a crane in a grid pattern. Post-spreading analysis showed that 20-60% of an area was covered in shell with this method. Initial monitoring of oyster spat showed successful natural recruitment on clamshell, with a mean density of 31 spat per square meter of constructed reef for an initial standing stock of 23K oysters. This was encouraging given long-term average spatfall results from the NH Fish and Game annual oyster survey of native reefs, which shows wide variability but post-2007 averages of only around 10 spat m^{-2}. Following the initial results, we returned to a section of the reef in 2010, 2012, and 2013 to check for survival and further recruitment. Observed oyster density on clamshell was 20 m^{-2} in 2010, 12 m^{-2} in 2012, and 45 m^{-2} in 2013. The recent increase was due mostly to strong recruitment (75% were <20mm) although some adults (>60mm) were also observed. After five years, the pilot reef still provides viable substrate for recruitment and structural support for adult oysters.

In 2010, we constructed a 1.0 acre clamshell reef at the mouth of the Oyster River (Durham) using 100 yd^3 of surf-clam shell, about 1 mile downstream of the pilot reef. Samples showed that spat recruited on clamshell at a low density of only 2 m^{-2} for an estimated 6K spat total. To amend the reef, UNH Jackson Estuarine Laboratory (JEL) conducted remote setting using 3M disease-resistant oyster larvae from our preferred provider (Muscongus Bay Aquaculture in Maine) to settle and grow out an estimated 201K spat using recycled oyster shell substrate. That year, our partners at NH Coastal Conservation Associates (CCA) began a restaurant recycling program to secure several tons of oyster shells used in the settling tanks that result in our "spat-on-shell". The 2010 NH Oyster Conservationist (OC) Program contributed 3K live spat from volunteer-raised sources that year. In addition to the grid reef, we also worked with three oyster farmers who each spread 25 yd^3 of clamshell on the bottom on areas of their aquaculture leases. These projects were funded by the USDA Natural Resources Conservation Service (NRCS). The shell was spread over an area of about 2.0 total acres as no-harvest restoration areas. 2010 totals include the 1.0 acre Oyster River with a standing-stock of 210K oysters (18 m^{-2}), plus an additional 2.0 acres of lease areas for a total restoration footprint of 3.0 acres. A return in 2013 to one section of the reef showed sparse new recruitment of about 4 m^{-2}.

In 2011, we constructed 2.0 acres of clamshell reefs at the mouth of the Lamprey River (Newmarket) using a total of 200 yd^3 of surf-clam shell. We also worked with an oyster farmer to spread 25 yd^3 of clamshell and remote-set seeding over a nearby 0.5 acre site around a rocky outcrop in the river. Post-construction samples showed 13 m^{-2} natural spat recruitment on clamshell for an estimate of 118K recruited spat. JEL remote setting amendments, using 6M larvae, produced an estimated 472K spat on recycled oyster shells. Our OC volunteers contributed excellent production that year with 17K spat-on-shell. In total, the 2011 Lamprey River effort produced a standing-stock of 607K oysters (65 m^{-2}) across the 2.5 acre restoration areas. Adult oysters are now observed on areas of these reefs although sampling is not planned until 2015.

In 2012, we continued to work in the Newmarket area but moved further south toward the mouth of the Squamscott River. We constructed 2.0 acres of shell reefs using a total of 83 yd^3 of surf-clam and recycled oyster shells. One acre was funded by NRCS and the Choice Oyster farmer with the help of TNC. Post-construction samples showed strong recruitment of 102 m^{-2} spat on clamshell for a total estimate of 148K recruited spat. JEL remote setting amendments, using 2.5M larvae, produced an estimated 85K spat on recycled oyster shells. The OC volunteers added 11K spat-on-shell that year. In total, the 2012 Squamscott River work produced a standing-stock of 244K oysters (33 m^{-2}) across the 2.0 acre restoration site. We returned to the site in 2013 to sample a section of the reef and found dense areas of new recruitment (<400 m^{-2}) and substantial survival (19 m^{-2}) of individuals greater than 60mm.

2013 Program Goal and Objectives

Goal

As in past years, our 2013 overall program goal is to increase vital ecosystem services provided by oysters (i.e., filtration capacity, nutrient sequestering, and fish habitat). The restoration team of TNC, UNH, and two oyster farmers combined for a total restoration goal of 5.0 acres, our largest annual goal to date. To meet this increased project size, we also set a goal to implement a large-scale shell deployment method similar to the largest US projects in Chesapeake Bay and Gulf of Mexico. We also seek to increase community awareness and engagement through our volunteer-based NH Oyster Conservationist program and other outreach efforts.

Objectives

Specific 2013 project objectives include: 1) 5.0 acres (200,000 ft^2) of shell-planting area, 2) minimum of 25% bottom cover using a pump/hose shell deployment method, 3) average initial reef density of 50 live spat m^{-2} from a combination of natural recruitment and spat-on-shell seeding (929K total oysters on five acres), and 4) expanded community outreach with 45 private homeowner sites as NH Oyster Conservationists.

2013 Results

The following sections described 2013 project results for site selection, pre-construction staging, reef construction, remote setting, volunteer seeding, monitoring results, and outreach:

Site Selection

Partially due to funder considerations, the project team decided to work in two distinct areas of the estuary in 2013: Piscataqua River (Dover) and Lamprey River (Newmarket). The Piscataqua River site (1.5 acres) was funded through an Environmental Protection Agency settlement assisted by Conservation Law Foundation for a water quality infraction downstream in the same river system. Prior to work, UNH conducted a video monitoring survey to identify an area of degraded oyster reef along the western shore of the river in Dover. The site was located in fairly close proximity to a live reef area close to the Sturgeon Creek (Fig 1) and video results showed suitable firm substrate and evidence of scattered oyster shell and cobble (Fig 2 left).

The second site was located in the primary channel at the mouth of the Lamprey river, near an intact live reef and our successful restoration reefs constructed in 2011 (Fig 2 right). The sites were delineated into three reef areas designated as TNC/UNH (2.0 acres), and two farmer-supported reefs for Granite State Shellfish (1.0 acre), and Choice Oysters (0.5 acre). Previous video monitoring from the site associated with the 2011 reefs identified suitable hard substrate along the channel bottom and around a rocky outcrop, with scattered shell and no eelgrass.

Fig 2. Piscataqua River reef area in Dover (left) and Lamprey River reef areas in Newmarket (right)

Wetlands permits for shell planting from NH DES were secured for the Piscataqua area (#2013-00457) and the Lamprey area (#2013-0052) in March 2013. Scientific permits were acquired by UNH from NH Dept of Fish and Game for remote set operations and by TNC to distribute spat-on-shell (#MFD 1325).

Staging

A new staging system was implemented this year to move bulk clamshell from our supplier site to the barge. Through our barge contractors, Riverside Pickering Marine, we were able to work with the industrial salt and sand processor on the Piscataqua River to accept the trailer truckloads of shell and provide loading services for the barge. The Granite State Minerals facility provided an outstanding operations and staging area for the project (Fig 3).


Fig 3. Staging operations at Granite State Minerals, Portsmouth, NH

Beginning in early June, we received thirteen full trailer truckloads of seasoned surf-clam shell (each about 33 yd^3) from M&W Livestock's shell facility in West Wareham, MA. In total, we stockpiled about 430 yd^3 of clam shell for base reef construction.

Reef Construction

Between June 21 and July 3, shell was loaded onto the barge and ferried out to the reef areas. The Piscataqua River site took two barge loads for a total of 150 yd^3. The Lamprey River sites required three barge trips to move the remaining 280 yd^3 of shell.

Fig 4. Shell deployment from barge using diesel pump and fire hose assembly

On location, the barge operator deployed the shell with a deck-mounted 150-HP diesel pump and fire hose assembly attached to a small barge platform that could be re-positioned (Fig 4). The barge was moved into location, spudded down, and the pump engaged to spray. The operator sprayed methodically to push the shell over the edge of the barge in a fairly steady stream. Another operator on the barge also used a clamshell bucket on a crane winch to supplement the shell spreading further out from the barge to reduce the number of spud relocations needed. The operators worked over the course of two weeks to distribute the shell, sometimes anchoring the barge down overnight when conditions were not suitable for safe deployment. Across both sites, a total of 200,000 ft^2 (5 acres) of tidal river bottom was shelled as reef foundation.

Remote Setting Operations and Seeding

To enhance reef development, UNH laboratory staff conducted remote setting operations to produce spat-on-shell amendments and seed the newly constructed reefs (Fig 5). Starting in May, UNH staff, TNC staff, and volunteers worked to prepare recycled oyster shell for remote setting. As in past years, our oyster shell supply was procured through the Coastal Conservation Association (CCA) Restaurant Recycling Program (www.ccanh.org). Due to the unprecedented need for spat, Ray Grizzle and Krystin Ward expanded operations from two to six setting tanks, each loaded with wire mesh cages filled with power-washed oyster shells. In total, we used 187 mesh cages each filled with about 350 shells for an estimated 65K total shells used. John McLean from the NH Agricultural Experiment Station located at UNH Kingman Farm again helped load oyster shell from our composting site for transport to UNH Jackson Lab. In total, we estimate that about 15 yd^3 of oyster shell was used for spat-on-shell substrate.

On June 21, we received 10M oyster eyed-larvae from our long-time provider Muscongus Bay Aquaculture (Bremen ME) for remote setting. Larvae were dispersed into six setting tanks with the clean shells in cages. Six days later after setting, cages were taken from the tanks and ferried out to the nursery raft for further growth. UNH staff conducted systematic sampling of on the raft from late June until mid-August to track survival and growth. During the weeks of August 19 and 26, cages were untied from the raft, loaded on service boat, ferried to the Lamprey and Piscataqua sites and dispersed by hand across the constructed reef areas.

Fig 5. Spat-on-shell operations with setting tank, spat relocation, and nursery raft.

Oyster Conservationist Program and Seeding

2013 marked the eighth consecutive year of the NH Oyster Conservationist program, a volunteer program for homeowners to grow oyster spat on their private docks for restoration. This was our biggest year ever for community engagement, expanding to 48 homeowner sites and 50 families, exceeding our recruitment goal of 45 families.

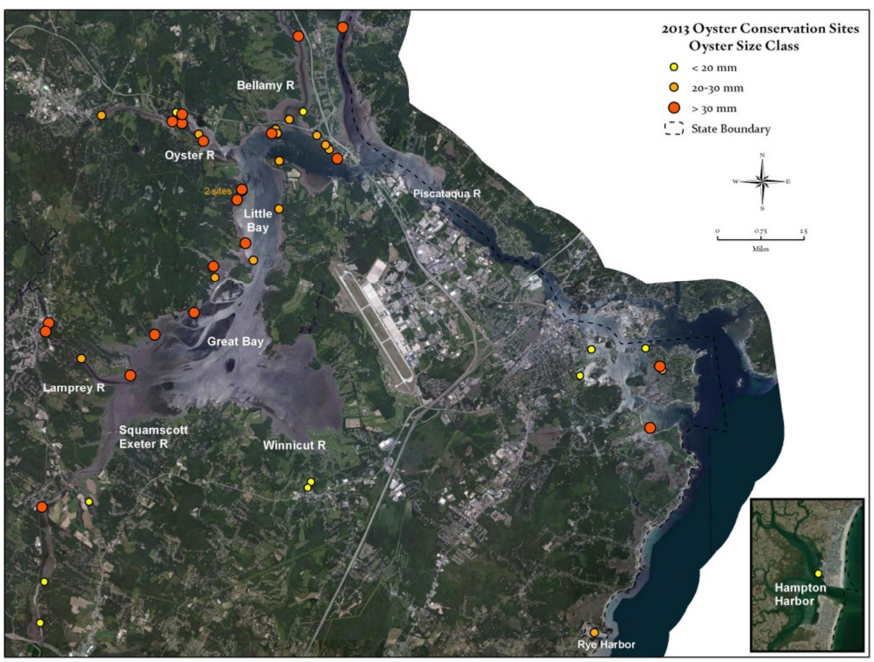

Fig 6. Distribution of 2013 NH OC program sites and summary oyster size results

Homeowners and supporting volunteers received training, data collection materials, and oyster cages for growing and monitoring spat. In all, we engaged 84 volunteers this year and operated in eleven towns around Great Bay Estuary, Rye Harbor, and Hampton Harbor (Fig 6). Our program participants contributed a total of 1500 volunteer hours of labor during the ten-week season. By the end of the season, our volunteers had raised over 50K healthy oysters, more than triple our biggest annual production. In late September, the volunteer-raised oysters were spread on the Lamprey reefs. The 2013 OC Final Report is available on www.nature.org/nhoysters at http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newhampshire/oyster-restoration/nh-2013-oyster-conservationist-report-for-web-1.pdf

Reef Monitoring Results

UNH conducted post-construction reef monitoring to assess project performance relative to program objectives for 1) shell coverage, 2) recruitment, 3) seeding operations, and 4) overall oyster density on created reef.

1. Shell Coverage. A total of 445 yd^3 of shell was spread across the 5.0 acre reef areas (430 yd^3 clamshell and 15 yd^3 spat-on-shell). The grid array of shell planting reef areas and ship-tracks of the UNH post barge construction video surveys are shown in Figure 7. UNH conducted video analysis of each sample point taken along the ship track to identify areas of high-density shell (100% cover and >20% cover), low-density shell (<20%) and no shell cover. To estimate shell cover, each sample point within the reef area is tabulated as either shell (high or low density) or no shell. The percentage of cover is then computed as the number of shell samples divided by the total number of video samples in the grid area. Table 1 shows the quantitative results for each of the reef areas.

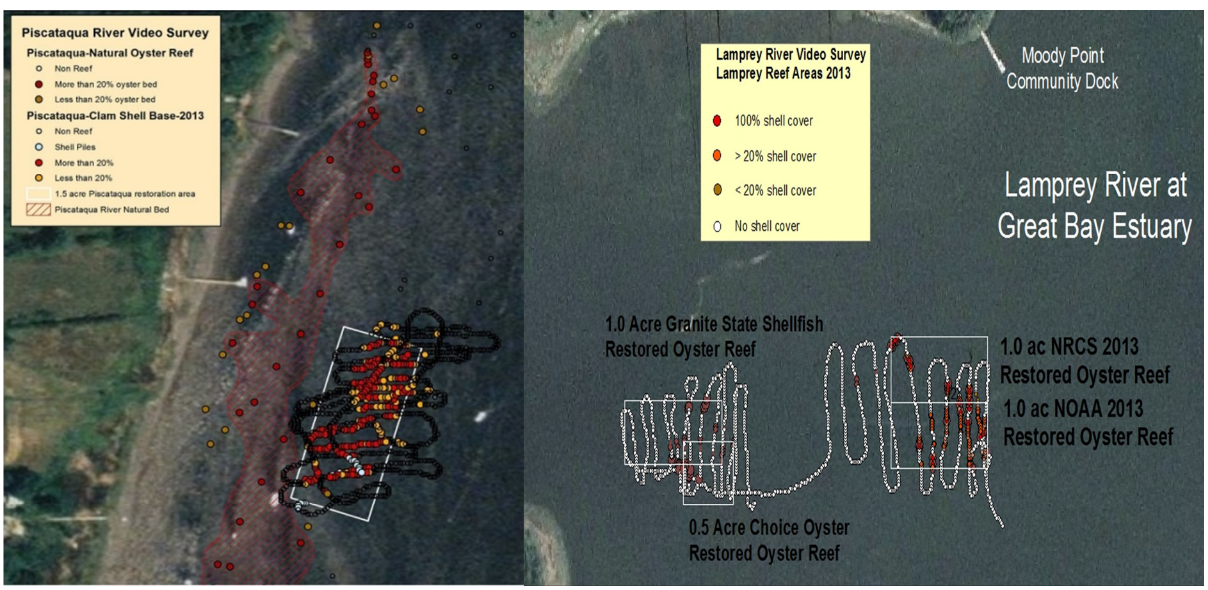

Fig 7. Video surveys of Piscataqua (left) and Lamprey (right) 2013 shell cover results

Per results in Table 1, the new barge shell spreading technique proved to be a reasonably effective method for constructing the base foundations for new reefs. For the Piscataqua, NRCS, and NOAA reefs, we used our standard allocation of 100 yd^3 of clamshell per acre of reef restored. Results from four previous years of shell spreading at this allocation using a one-yard-at-a-time method showed that an average of 40% shell cover was achieved. With the new pump/hose method, we were able to achieve an average

45% of channel bottom cover for the three reefs at full shell allocation. The two oyster farmer reefs using a reduced shell allocation covered 16% of bottom in those locations. Across all five acres of construction, we achieved a weighted average shell cover of 36%. Our results exceed the NOAA Restoration Center minimum metric of 25% shell cover, and at full shell allocation, validate the new method as an effective technique for distributing bulk shell. We recognize that results will vary from site to site due to, among other factors, shell loss in areas of soft sediments, presence of tidal currents that redistribute shell, and variability in the amount of shell hosed overboard at a spud location that produced deep piles in some areas. Going forward, we will continue to use the new technique and adaptively seek improvements.

Table 1. Shell coverage summary

Reef	Reef Size (ac)	Clam Shell Used (yd^3)	Video Samples (shell/total)	Percent Cover	Area Cover (m^2)
Piscataqua River	1.5	150	246/455	54%	3010
Lamprey NRCS	1.0	100	28/110	26%	948
Lamprey NOAA	1.0	100	90/180	50%	1858
Lamprey Granite State	1.0	40	19/119	16%	595
Lamprey Choice Oyster	0.5	40	9/58	16%	297

2. <u>Recruitment</u>. Reef clamshell substrate was sampled between September and November 2013 to assess first-year natural oyster recruitment on deployed shell. UNH used a custom-built benthic sampling device known as a patent tong to monitor for live oysters on the reef (Fig 8 left). The tongs are dropped on a winch line and spring shut when the bottom is encountered to collect oysters, shells, sediments, and bottom material. Samples are winched back to the surface and analyzed by hand for oyster counts on shell substrate (Fig 8 mid).

Fig 8. Patent tongs (left), recruited oysters on clamshell (mid), spat-on-shell (right)

The patent tongs are calibrated to retrieve 0.16 m^2 of reef area, which allows us to estimate density of live oysters recruited per square meter of constructed reef. The monitoring team used the shell distribution maps from the video monitoring to target shelled areas for stratified random sampling within a reef block area. For sampling purposes, three reef block areas were established: Piscataqua, Lamprey NOAA/NRCS, and Lamprey Granite/Choice. Four samples were taken in the 1.5 acre blocks and seven samples taken in the 2.0 acre NOAA/NRCS block. Sampling results are shown in Table 2.   Density results are multiplied by the amount of shell cover in each reef area to estimate total recruitment. Oyster spat on clam-shell sizes were between 1-20 mm except for a few individuals in the Lamprey NOAA/NRCS block that were 20-40 mm in size.

3. Remote Set Seeding. Within two days of larval release into the tanks (June 23), samples showed that larvae had successfully set on the shell. The initial samples showed an average set of 47 spat per shell. With an estimated 65K shells in the tanks, our initial yield was about 31% (3.1M set from 10M eyed larvae). Samples taken six days after the larval release (June 27) showed similar results and the spat in cages were moved out to the nursery raft. Two raft samples in July showed growth of spat from 8 to about 10 mm but also mortality (29 and 21 spat per shell observed) presumably due to natural conditions and crowding. On August 19, spat were sampled for a final time with overall average size of 17 mm. Final average spat density was 16.5 spat per shell for four tanks supporting the Piscataqua and Lamprey NOAA/NRCS reefs, and 18.5 spat per shell for two tanks used by the oyster farmers. At deployment, we estimated total seed production of 1.13M oysters.

   Spat on shell spreading was done the weeks of August 19 and August 26 (Fig 8 right). Based on the number of cages emptied onto each reef area, we estimated the total amount of spat seeding for each of the five reef areas. Table 2 shows the spat-on-shell seeding allocation. Including volunteer seeding, our remote set efforts produced 1.19M oysters and exceeded our project goal of 929K seeded oysters at an estimated 122% of target.

   We returned to the Lamprey constructed reefs during November sampling to check for survival of seeded oysters. Spat-on-shell from two samples were very dense with 534 and 2331 live juveniles m^{-2} observed. Juveniles showed good signs of growth, with more than half of the oysters sampled larger than 20 mm and several individuals larger than 40 mm.

Table 2. Oysters recruited and seeded on constructed reef areas (* and ** are pooled results)

Reef	Reef Area (ac)	Area of Shell Cover (m^2)	Observed # spat m^{-2} (n)	Total Recruit Estimate	Spat-on-Shell Seeding	Volunteer Seeding	Total	Density # spat m^{-2} (reef area)
Piscataqua River	1.5	3010	19 (4)	56,437	353818		410255	74
Lamprey NRCS	1.0	948	243 (7)*	230262	138194	7320	383095	103
Lamprey NOAA	1.0	1858	243 (7)*	451494	138194	50607	690902	186
Lamprey Granite State	1.0	595	145 (4)**	86360	133200		219560	59
Lamprey Choice Oyster	0.5	297	145 (4)**	43180	310800		353980	191

4. Reef Density and Total Counts. Density results were variable across the reef areas due to differences in recruitment and seeding. Table 2 shows estimated year-one density for each area, ranging from 59 m^{-2} on the Granite State site to 191 m^{-2} for Choice Oyster. All site areas exceeded the post-construction density goal of 50 m^{-2}. The overall average

weighted density for the five acre restoration project is 108 m^{-2}. The total number of oysters established in restored areas in 2013 was 2.06M oysters, exceeding our total restoration oyster target by an impressive 215%.

Outreach

Building and sustaining connections with the community at large continues to be a major objective for our program. We increasingly recognize that the ever-popular oyster is perhaps the best way to relate tangible estuarine values to the average citizen. As in past years, our outreach efforts include a broad array of activities and actions that communicate the strong connections between oysters, healthy estuaries, and vibrant communities. In particular, the expanding Oyster Conservationist program leads our outreach activities through direct engagement with a growing community of oyster enthusiasts. This year, volunteerism reached a new level of engagement as the Oyster Conservationist program established itself as perhaps the largest community-based volunteer program in Seacoast NH.

Outreach events and activities in 2013 include our busy outreach tents at the Piscataqua Oysterpalooza in September, the UNH Know-The-Coast Day, and as guest speakers on a public cruise aboard our partner's Gundalow Company educational vessel and at a popular Portsmouth Brewery as part of the Sustainable New Hampshire series. In June, TNC hired a sightseeing vessel and brought more than forty town officials and citizens to the Piscataqua River to view the reef construction. Collectively, it was a highly successful year of raising public awareness through the charismatic powers of our native oyster.

Conclusions

2013 was a watershed year of progress for oyster restoration in New Hampshire. Our results exceeded targets and expectations in every measure, and in perhaps the most important metric of total oysters we achieved more than twice our target. Figure 9 shows a summary history of our restoration work since 2009 and the huge contribution that 2013 has made to the program and the estuary at large.

Looking collectively at the past five years, we can begin to make some assessments of the overall impact of our program on oyster populations in Great Bay Estuary. Known areas of oyster beds have been monitored continuously in GBE since the early 1990s but there has been no comprehensive survey of the entire system to estimate the total footprint of live oyster reefs. However, there is increased effort for survey work in 2012 and 2013 and a picture of native reef area is emerging as more reef areas are delineated. The most recent survey results are still being complied but it appears that a reasonable estimate of live native oyster reef may be on the order of 120 acres. Using a long-term observed survey density of 50 oysters m^{-2} on native reefs we can infer that these 120 acres of natural reefs harbor about 24M total oysters. Our restoration efforts in the past five years have established 13 new acres of reef and added an estimated 3.14M oysters to the system. If we make the assumption, and this is yet to be fully established, that our constructed reefs maintain fairly stable populations (i.e., annual mortality balances annual recruitment), our restoration efforts have expanded by at least 10% the reef acreage and native oyster populations of the entire GBE ecosystem in the past five years. Long-term monitoring is most certainly needed to better understand population dynamics, including impacts of an apparently substantial spawning event in 2013, but results to date demonstrate that our reefs are capable of recruiting spat and maintaining adults for at least four years post-construction. Clearly, more extensive monitoring efforts will be required to show long-term sustainability of restored reefs and dynamics of native reefs in our system.

Each year, we build on past efforts and gain insights and encouragement for future restoration. We learn much from our evolving techniques and methods, all in the context of constantly changing complex ecosystem. There were many highlights in 2013 but ultimately, the year is just another building block for the future. We are pleased with recent results and continue to build momentum for oyster restoration as one of the best ways to restore the health of Great Bay Estuary. But the challenge remains. To quote Rachel Carson "Conservation is a cause that has no end. There is no point at which we say 'Our work is finished'".

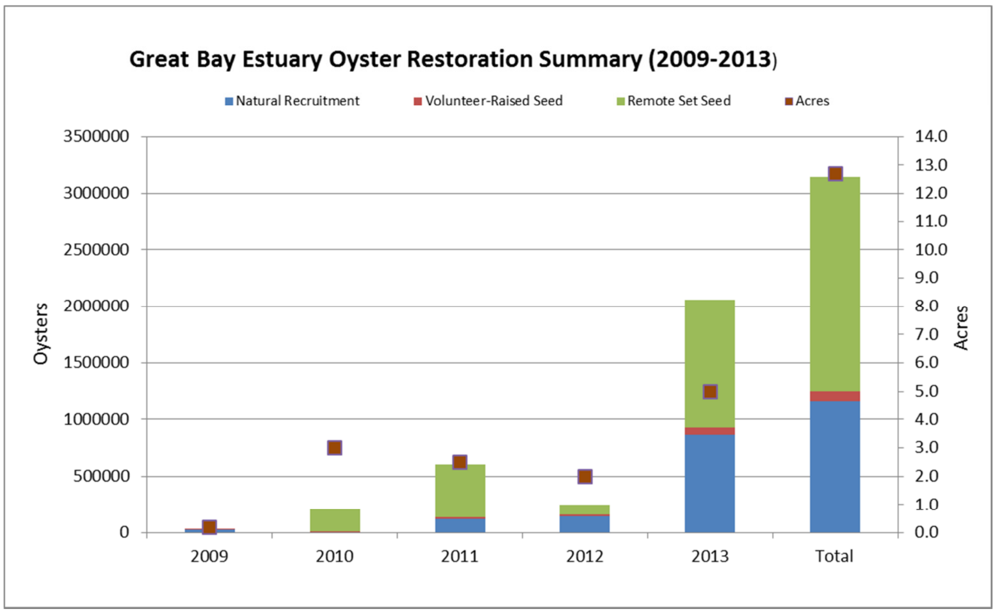

Figure 9. Five-year summary of oysters and acres restored in Great Bay Estuary

Acknowledgements

We are grateful to everyone who contributed to 2013 NH oyster restoration efforts. In particular, we would like to acknowledge long-term funders and partners who continue to support this work, including the Natural Resource Conservation Service and the NOAA Restoration Center. The local oyster farmers at Choice Oysters and Granite State Shellfish partnered again on this project. We are also thankful to the Environmental Protection Agency, the Conservation Law Foundation, Piscataqua Region Estuaries Partnership and Grimmel Industries for collaboratively directing funds to restoration work. Other partners due recognition include the NH Coastal Conservation Association, Gundalow Company, NH Fish & Game, NH Department of Environmental Services, Stone Church and Adam Schroadter, and of course UNH (John McLean at NH Agricultural Experiment Station, Roads & Events, Docents, and the Coastal Research Volunteers). As always, we give special thanks to our NH Oyster Conservationists and all of our dedicated volunteer helpers.