Captain Spencer Bartels ferries a load of shell to a restoration site. Photo: Kim Granbery

Returning Long Island Sound oyster beds to their former glory one shell at a time

By Tessa Getchis

Of the many Connecticut state symbols, you're probably only familiar with two or three.

Maybe you know the Charter Oak is the state tree, or that mountain laurel is the state flower, or the American robin is the state bird. A few trivia buffs might remember that the sperm whale is the state animal and that American shad is the state fish.

But I'm guessing you don't know there's a state shellfish, much less which bivalve has that distinction. People I meet at outreach events are often surprised when I tell them it's the Eastern oyster, (*Crassostrea virginica*). It is a title well-earned through centuries of history, shaping the state's culture, coastline and maritime economy long before it became an official symbol.

The oyster was an Indigenous staple, and today Connecticut's oysters are a culinary treasure. Oyster beds serve as the quiet foundation of Long Island Sound, cleaning our waters and protecting our coastlines. Beyond driving a thriving multi-million-dollar aquaculture and fisheries industry (also a surprise to some people), these incredible bivalves serve as a keystone species with a massive impact on the entire estuarine ecosystem.

A single oyster can filter multiple gallons of water a day, and collectively they help to keep the Sound clean and clear. Oyster reefs also act as natural breakwaters buffering the shore from storm surge and erosion. Additionally, their three-dimensional structure creates essential habitat and feeding grounds for crabs, fish, shorebirds and diverse marine life.

Despite their immense value, pollution, development, erosion and storms threaten their survival. The most considerable threat in the last decade has stemmed from increased silt flowing from rivers onto oyster beds following extreme rainfall. As rain pours over the land, it carries sediment into waterways that lead to the Sound. Silt can smother adult shellfish and inhibit settling of larval oysters by burying the essential shell substrate they need to attach to. Additionally, shoreline erosion from increased wave intensity during storms negatively impacts the coast and oyster beds.

While conservation measures including legal protections have helped, human intervention remains critical to revive this important habitat. To meet this challenge, a novel restoration program came to fruition through the very people who know these waters best: local shellfish growers.

Enter Garrett Timmons, owner of Harmony Sea Farms in Stonington. Also serving as the District Conservationist for the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), he bridged both roles to help shape the state's recent initiative. That involved prioritizing

The creek at the restoration site is barren of shell before the restoration. Photo: Kim Granbery

degraded oyster beds, establishing guidelines for shell recycling and securing restoration funding.

“We work daily in forested and agricultural landscapes to manage and improve wildlife habitat at NRCS,” Timmons said. “Extending that work into coastal ecosystems has been a long-term goal of NRCS, and I was glad to contribute—especially after spending so much time working in those areas myself.”

David Carey, director of the CT Department of Agriculture’s (DOAG) Bureau of Aquaculture, described the experience of earlier restoration efforts.

“Initial restoration efforts on historically productive natural oyster beds located offshore met with marginal success due to the large expanse and limited shell resource,” he said.

He noted that intense seed oyster recruitment has been observed in intertidal brackish rivers and inland bays over the last two years. Therefore, distributing shell amongst the variety of natural bed habitats especially the nearshore areas will help to maximize oyster recruitment.

While the ongoing broader effort has rebuilt more than 2,000 publicly owned acres to date, many near-shore areas remained off limits because they were privately managed for commercial farming.

Seeing the challenge of the privately managed nearshore areas, Timmons reached out to CT Sea Grant and DOAG to design a program that would eliminate that barrier. They turned to the NRCS Environmental Quality Incentive Program (EQIP), a nationwide initiative that compensates farmers for implementing conservation practices. Traditionally used in land-based agriculture, the framework had to be adapted for aquaculture to capitalize on farmer experience and know-how to implement conservation on privately managed farmland, usually outside of primary production areas. The program secures funding for farmers to purchase shell substrate and oysters to build beds, relying heavily on shellfish farmers who possessed the exact focus, capabilities, logistics and passion needed for a comprehensive habitat restoration effort.

The program began to take shape on a hot, muggy day two summers ago around a picnic table. Kim Granbery of Leete’s Island Oyster Co. in Guilford, Emilie and Jonathan Waters of Thimble Island Shellfish Co., and Spencer Bartels of Stony Creek Oyster, both in Branford, sat down with Timmons to discuss what all could bring to the table. For my part—well, I love bringing passionate people together to solve problems—and that’s just what we sat there to do.

The farmers worked unique beds spanning deep, wide bays as well as shallow creeks. While those shallow creeks are too tight for easy harvesting, they act as the perfect nursery to sprout new life, which then grows and spills over to fill the deep-water farms. An essential component was the farmers’ private shoreline access and infrastructure, a major limiting factor for maritime operations. They also brought another important asset to the collaboration—the

Kim and Gretchen Granbery celebrate after a successful day of planting oyster shell on a restoration site. Photo: Tessa Getchis

commercial vessel, the *Virginia Rail*, which is uniquely well-suited for transporting and broadcasting shell and oysters across the small, narrow estuaries.

The first step of the project involved acquiring and staging a large amount of oyster shell to construct the reef beds. The material was obtained from Collective Oyster Recycling & Restoration or CORR, the state's first shell recycling nonprofit. Since its inception three years ago, CORR has recycled and repurposed more than one million pounds of shell that would have otherwise been discarded by restaurants and seafood wholesalers.

Next, the shell was hauled by a bucket loader onto a conveyer belt and onto the deck of the *Virginia Rail* before the crew motored to the restoration site. Once onsite, the oyster shells were poured over the deck and onto the otherwise barren sea floor. Cultivated oysters are planted on sites where natural oysters beds no longer existed.

You may wonder why a farmer would invest time in restoring oysters. Granbery, who grew up looking out his bedroom window at the marshes and estuaries of the Thimble Islands, fondly recalls watching the local oyster companies working the waters. Later in life, he worked for one of those shellfish businesses before eventually starting his own. Although harvesting and sales were part of the initial focus of his operation, he and his wife Gretchen regularly engaged in independent restoration work simply to improve the overall health of the estuary.

"Cage culture was already a popular approach to oyster growing, but I was more interested in sustainably harvested wild caught oysters," Granbery recalled.

He noted that the oysters in his local creek had survived the onslaught of the two oyster diseases (MSX and Dermo) in the 1990s, leading him to believe that the survivors were highly disease resistant. That sparked his desire to steward the resource.

“By using best management practices in cultivating, shelling and returning both small oysters and large spawner oysters to the seed beds, we have increased both the yield and the size of the biomass on these beds,” he said.

Over time, restoration became their primary mission, and commercial farming became a side benefit.

Carey added the statewide perspective.

“Connecticut is unique in that the majority of its oyster businesses still rely on Mother Nature to supply oyster seed rather than sourcing them from hatcheries,” he said. “The long tradition of harvesting seed oysters from natural beds and then planting them on private shellfish grounds has kept the industry alive for centuries.

“The swift current and gravel bottom of the Housatonic River (location of the state’s largest natural oyster bed) naturally performs the necessary enhancement of removing silt accumulation, creating an impeccable self-sustaining nursery,” he continued. “Future DOAG restoration efforts will focus on planting shell in the slower moving mud-bottom rivers similar to the EQIP project on private grounds where nature does not address the silt accumulation naturally.”

Planting oysters along the fringes of farms helps to improve the overall ecosystem services that both wild and cultivated oysters provide—food, recreation, improved water quality and clarity and habitat provision among them. Additionally, these newly created nurseries will also help supply nearby commercial farming areas with fresh oyster larvae.

Despite having to navigate complex licensing, permitting, and other hurdles, Garrett, Granbery and the rest of the team successfully launched a high-impact program.

“I believe from observation, experience and history that the long-term resilience of the oyster population in the state of CT may depend on genetically disease resistant oysters that continue to evolve in the smaller brackish water estuaries throughout the state,” Granbery said.

Through this unique partnership, the NRCS and partners are restoring vital marine habitats and providing economic support to conservation-minded farmers, ensuring that the Eastern oyster, Connecticut’s state shellfish, continues to protect the Sound and provide for generations to come. It’s no wonder Gov. Ned Lamont in 2024 famously called Connecticut “the Napa Valley of oysters.”

For more about state symbols, including the state shellfish, visit: https://portal.ct.gov/About/State-Symbols

Kim Granbery spreads the shell evenly across the bed at low tide. In these small creeks, manual labor is a necessary part of the job. Photo: Gretchen Granbery

Restoration site after planting shell. The newly restored site will eventually serve as habitat for a myriad of marine organisms. Photo: Kim Granbery

History in an oyster shell

Prior to the arrival of Europeans, local tribes harvested wild Eastern oysters as a reliable, highly nutritious food source.

The incredible history of Indigenous oyster use and conservation lives primarily in oral tradition, proving that there is still so much rich, local Native history left to discover. Building on this ancient relationship with the water, European colonists soon arrived and began shaping their own complex, industry-driven history with the oyster.

By the early 1700s, colonial overfishing grew so severe that Connecticut towns passed some of the nation's earliest shellfish laws. This included a 1762 ban on harvesting during summer spawning months and a 1766 ban on destructive harvesting equipment.

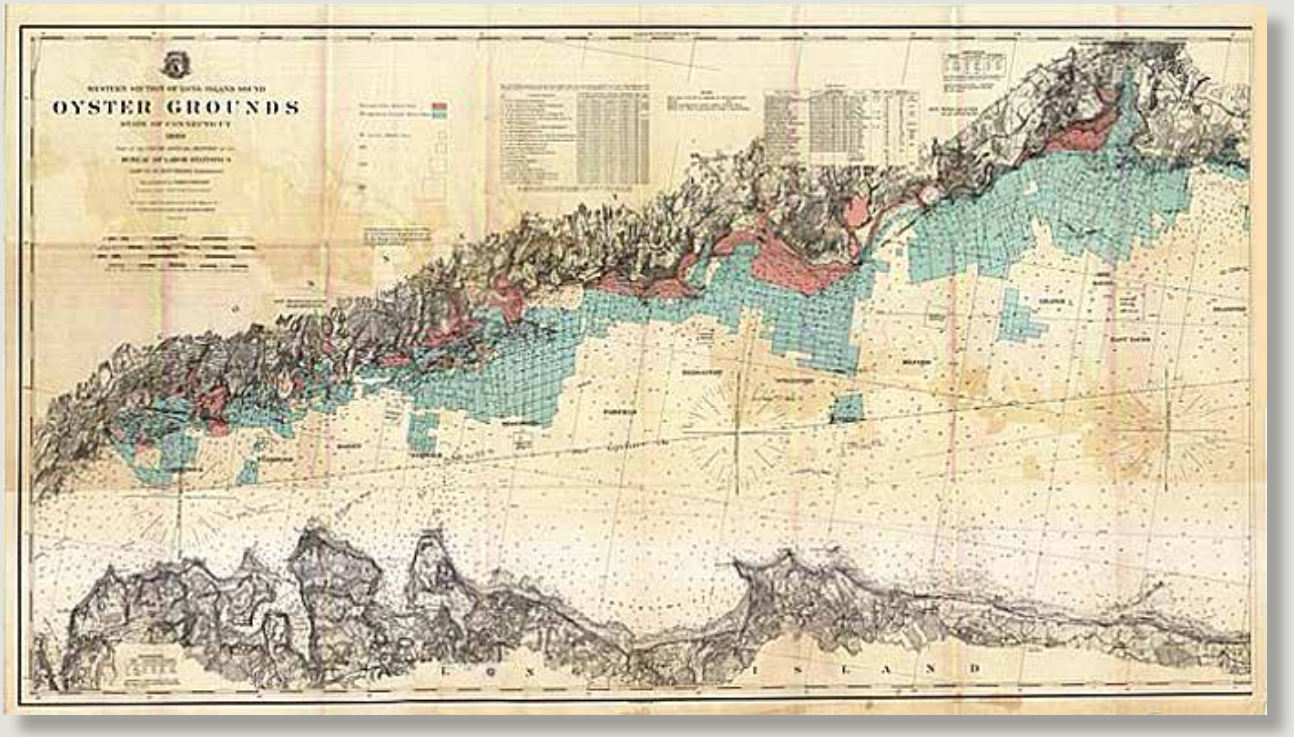
By the mid-1800s, local oyster harvesters began experimenting with planting oyster shells called "cultch" in shallow water to artificially catch and raise wild oyster seed or "set." In 1855, a Public Act known as "the two-acre law" provided towns the ability to grant individuals perpetual private titles to underwater parcels. By establishing legal property rights over the sea floor, the state gave oystermen the security they needed to invest in cultivation rather than just harvesting from the wild.

This shift from hunter-gatherer to farmer marked the birth of Connecticut's oyster farming industry. By the late 19th century, Connecticut was at the center of the world's oyster industry. Natural and farmed oyster beds occupied tens of thousands of acres along the shoreline.

At the time, the state boasted the largest fleet of oyster steamships in the entire world, transforming cities like New Haven and Norwalk into major packing and shipping ports. Today, the Eastern oyster remains a cornerstone of Connecticut's maritime and agricultural economy, with oyster businesses spanning the coast from Stonington to Greenwich.

To support the restoration of Connecticut's oyster habitats, a 2021 CT Public Act (PA 21-24) established oyster shell recycling as a key priority.

—Tessa Getchis



Map of western Long Island Sound oyster grounds in Connecticut in 1889 prepared by James P. Bogart