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WRACKLINES

WHERE CONNECTICUT MEETS THE SOUND



RESTORATION OF NATURAL SPACES: THE WAY TO A BETTER FUTURE

INVASIVES REMOVAL • OYSTERS 2.0 • 6 ROLE MODELS • DAM PROBLEM • DOUG TALLAMY • EELGRASS RENAISSANCE

Sea Grant
CONNECTICUT

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From the Editor



Take your urge for a creative outlet outdoors, and bring a shovel

Creativity is about much more than making something new, be it a song, sculpture or garden.

It can also be about taking what already exists and making it new, while not losing its essence. Take this example of what's called an erasure poem. I crafted it from phrases chosen from the first paragraph of Ralph Waldo Emerson's 1836 "Essay on Naure."

Emerson and me
Solitary, not lonely
great and tranquil thoughts
of October trees
Nature entrances
Sunny hours of longevity
tempered light of the woods
persuades us
to quit our solemn trifles.

What started as more than 350 words was whittled down to just 28. The result, I hope, is a distillation of the original that reflects both the master transcendentalist and the modern reader of his work. Perhaps it's effective at revealing Emerson's relevance in this age of underdeveloped attention spans.

This was, of course, a solo exercise, as are many artistic endeavors, whether it's writing a novel, painting a landscape or composing a symphony. The larger community gets involved when it's shared.

Nature restoration can also be a creative act, but it's one that by definition is more about the larger community of people and wildlife from the start. Individuals who work to restore their own yards recognize that their property is part of the larger environment and seek to contribute to a healthier planet.

When taken up as a group effort, restoration projects bring people together for the greater good throughout the process. Some examples are described in this issue: a degraded marsh is cleared of invasive plants, making room for native wildflowers and shrubs that attract pollinators and birds; a dam is removed from a river, allowing migratory fish to return to spawn upstream. Once thriving oyster beds are replanted, and thinning eelgrass meadows regrow after reseeding projects, both expanding habitat for juvenile fish and other marine life.

"Restoration has to be part of the future, not to replace conservation efforts but to add to them," said Douglas Tallamy, one of the nation's leading advocates for native plant gardening, who shares his vision in one of the articles.

He advocates for doing what we can to fix our own yards, as well as restoring public parks, preserves and other outdoor spaces into places with more kinds of native wildlife. It may be the kind of creative expression we most need to better the world and stay hopeful.

"What (people) are excited about," he said, "is being empowered to be part of the solution."



Judy Benson
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Cover: Skylar Bartels washes off shells before planting them in a restoration site as her father, oyster farmer Spencer Bartels, works at the back of the boat. Photo: Kim Granbery

Above: Growing native plants such as cardinal flower and turtlehead in your garden is a great way attract pollinators and contribute to environmental restoration. Photo: Judy Benson

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Erica Casper is the Long Island Sound outreach support coordinator for Connecticut Sea Grant and the Long Island Sound Partnership. She advances science communication related to the protection and restoration of Long Island Sound and its watershed. With over a decade of experience in writing, content development, and outreach, she has translated complex topics for both scientific and public audiences. Casper holds a master's degree in marine science from Boston University and has supported initiatives at universities and research institutions.

DOUG TALLAMY



Doug Tallamy is the T. A. Baker Professor of Agriculture in the Department of Entomology and Wildlife Ecology at the University of Delaware, where he has authored 120 research publications, several books, and has taught insect related courses for 45 years. Chief among his research goals is to better understand the many ways insects interact with plants and how such interactions determine the diversity of animal communities. In 2021 he cofounded Homegrown National Park with Michelle Alfandari (HomegrownNationalPark.org).

JUDY BENSON



Judy Benson has been communications coordinator at Connecticut Sea Grant and editor of *Wrack Lines* since 2017. Before that, she was a newspaper reporter and editor, concluding her journalism career at *The Day* of New London covering health and the environment. She is the author of two books, the latest titled, The *Book of Todd*, a collaboration with her late husband published in cooperation with New London Librarium (nllibrarium.com). She earned both a bachelor's degree in journalism and a Master of Science in natural resources from UConn.



Volunteers remove black swallow-wort from Bluff Point State Park in Groton in July. Photos: Annie Sherman

Invasives removal: an essential step in restoration

How stewards of two CT parks are improving the landscapes for pollinators and other wildlife

By Annie Sherman

The fibrous roots of black swallow-wort plunge almost two feet deep along the rocky exposed headland of Groton's Bluff Point State Park. The invasive vine pops up in clumps among native plants, looking innocent and appetizing to monarch butterflies and other pollinators who confuse it with their favorite egg-laying target, milkweed.

The southwestern European vine is an unwelcome invader here and in other locations along the coast, so biologists with University of Connecticut (UConn), CT Sea Grant, the CT National Estuarine Research Reserve (NERR), and the CT Department of Energy and Environmental Protection (DEEP) are making a concerted effort to eradicate it from the beloved state park.

Scraping away the stones and gravel to expose and remove the extensive root systems, more than 30 volunteers and plant experts gathered in July to put manpower to work for the planet.

Nearby at Ocean Beach Park's Alewife Cove in New London, experts have targeted two other invasive plants from this tidal estuary: phragmites and mugwort, both from Eurasia. Phragmites, a common reed that flourishes in wetlands and coastal areas, and mugwort, an aggressive invasive perennial found widely in sandy soils, threaten to dominate native species. So these teams of educators and biologists are fighting back.

Invasive plants, according to the Connecticut Invasive Plant Working Group at UConn, are plants native to other parts of the world that have been transplanted, either deliberately or accidentally, to a new area where they have no natural controls on their rapid spread.

"They are disruptive in a way that causes environmental or economic harm, or harm to human health," according to the group's website (https://cipwg.uconn.edu/).

Jane Seymour, DEEP wildlife biologist, further explained their impact.

"The problem with these non-native invasive plants is they have found a way to spread rapidly. So they outcompete our native plants," she said, pointing to another swallow-wort vine among the rocks while explaining the cascading tragedies. "If you have an area that has, say, 100 different

species of native plants, and then this one non-native invasive takes over, then the area has lost 99% of its plant diversity. When you remove those native plants, the insects don't have anything to eat. And then the birds and other animals that feed on the insects don't have anything to eat."

This abundant wildlife makes its home at two of the most popular parks in the state. But Bluff Point and the Alewife Cove section of Ocean Beach Park are also magnets for beachgoers, walkers, birdwatchers and families who recreate and enjoy the trails year-round. Experts emphasize that the importance of eliminating these invasive plants is a critical component of their larger restoration projects to safeguard these coastal areas' long-term ecology and recreational access.

"One of the really hard things with invasive removal is to get the bad guys out. They will come right back unless you plant the new openings with natives," said Juliana Barrett, extension educator emerita at CT Sea Grant. "This was a pretty extensive infestation of black swallow-wort."

Indeed, identifying the swallow-wort, phragmites and mugwort was the first in a series of steps to remove the invasive plants and possibly treat the area to prevent further spread, said Jason Krumholz, UConn research professor and NERR stewardship coordinator.

The effort at Bluff Point started three years ago, he said. It began with mapping the invasives, creating an inventory of where they grow and writing an action plan for their extermination. They zeroed in on Bluff Point, because swallow-wort was just starting to get a foothold there. The team could make an impact and keep it from proliferating. In comparison, Oriental bittersweet is wildly out-of-control there, he said, so trying to eradicate it would be futile.

"This does really matter, and it matters disproportionately for the ecology because of the butterflies," Krumholz said. "I'm super happy that we removed 150 pounds of invasive plants."

While that doesn't eliminate every invasive plant in the state park, he admitted, it does represent a significant reduction in the black swallow-wort invasion. Seymour explained that even removing this amount is good news for monarch butterflies that specifically depend on milkweed to lay their eggs and provide leaves for their caterpillars to feed on when they hatch. Alternately, if butterflies lay their eggs on black swallow-wort, a plant related to milkweed but toxic to monarch caterpillars, the caterpillars die soon after they hatch.

At Alewife Cove, teams considered these cascading consequences while cutting down phragmites, a familiar yet invasive coastal plant. CT Sea Grant Assistant Extension Educator Owen Placido explained that they schedule regular mowing to maintain the phragmites population, including one this fall. This is followed by a targeted application of herbicide by licensed professionals, which he said is the best way to prevent regrowth.



Jane Seymour of CT DEEP looks for monarch butterflies and their eggs on milkweed growing at Bluff Point State Park while helping remove invasive plants. Photo: Annie Sherman

"Once that is finished, the site is ready for us to go back in and do the fun part and seek out native plants to do the final restoration portion. They'll be native plants that are most valuable to wildlife and pollinators, that have high value but also have salt tolerance because we're in a coastal environment," Placido said.

Seaside goldenrod, American beach grasses and native coastal roses, shadbush, sweet Joe-Pye-weed, and maybe some Eastern red cedars are on the wish list, he explained, and they're targeting next spring for planting.

"This is both an opportunity for people to get connected to the coastal ecosystem but also it's a really rich environment for birds, animals, and pollinators, providing valuable food and habitat sources," he said. "We've made good progress with consistent effort of people working with their hands to free up the other side. Things are looking clear."

Long-time Save Ocean Beach volunteer and field biologist Beth Lapin said the Alewife Cove and larger Ocean Beach Park areas have some sections of high-quality native vegetation, but there are large sections that are



Volunteer Alan White, left, works with Owen Placido of CT Sea Grant removing mugwort from the Alewife Cove marsh area at Ocean Beach Park in New London in August. Photo: Judy Benson

overwhelmingly invasive. This location is personal to her, as her family has enjoyed time here for six generations, so she's devoted to pulling out mugwort plants to prevent infestations as well as tackling existing overgrowths of other species, such as barberry and honeysuckle.

"You never realize there's a plant that's invasive until you learn about it, and then you see it everywhere. You drive along and see mugwort where it is, even though you never saw it before," Lapin said. "It was just very clear to me that here was a natural resource that was being impacted, so I felt like it was my responsibility to move forward. I needed to do it. I felt compelled."

The effort is already reaping tangible benefits, she said.

"I can definitely see that the native plants are doing much better and are resurging in certain areas," she said. "I found a prickly pear the other day that I had never seen there before. I can also see some bayberry bushes are filling out where they were being impacted by non-native shrubs that we cut out. We've seen catbird nests, which are unexpected. And though it's harder to quantify, I've seen brown snakes in there, so the area is clearly being used in a way that wasn't before."

The timing of these invasive removal work parties is not coincidental. Working in the narrow window of the parent plant's growth and the budding of new fledgling plants, Seymour explained that the removal crews arrived at Bluff Point between black swallow-wort bloom and the development of seed pods. The plants put all their energy into flowering and developing seeds, and when the team pulls them out, they try to get as much of the roots as possible to prevent regrowth. While phragmites stalks don't have seed pods, they do have fluffy flower-and-seed clusters called panicles that are carried on the wind to disperse small seeds. Placido said the team arranges cuts when those bush clusters aren't too large to maximize removal and reduce regrowth potential.

An unexpectedly positive twist of the team's work in Alewife Cove, Lapin added, is that now they are monitoring for the presence of invasive spongy moths that produced caterpillars that were denuding bayberry bushes. She said that their weekly volunteer work groups from April through November, when she spent 68 hours in three months with a small cadre of additional volunteers pulling out invasive plants, are making a big impact toward keeping the area as native and natural as possible.

Having teams engaged in this work at such specific times is something these organizers do not take for granted. Krumholz emphasized the importance of community science, which he believes is important because volunteers' interest magnifies impact at a critical time in the lifecycle of the plants' growth and the parks' long-term ecological forecast. This makes a big difference in the spread of knowledge and interest while helping quell invasives over decades and even generations.

"Getting out and really seeing that, getting their hands on it. This is important. Our group saw milkweed with monarchs, and we could actually see that this is what we're protecting," Krumholz said. "It's one thing for us to go out and knock it down, and that's an important component of our mission. But it's another thing entirely for teams of volunteers to come out and work by hand, go around native species and learn about the water, learn about the ecology, and care about it."

These experts agree that none of this would be possible without grant funding and cross-organization collaboration. And while these two invasive removal projects represent a small portion of the invasives across the coastline and entire state, they hope that one small pocket will lead to another small pocket and soon become a connected swath of invasive-free spaces for native plants to allow birds, insects, and pollinators to make their home.

"We're excited to be able to have the funding to do this habitat restoration work," Placido said, "and I'm really excited to see the final results once we're able to replant, because it will add a lot of value to the local ecosystem and habitat."



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.

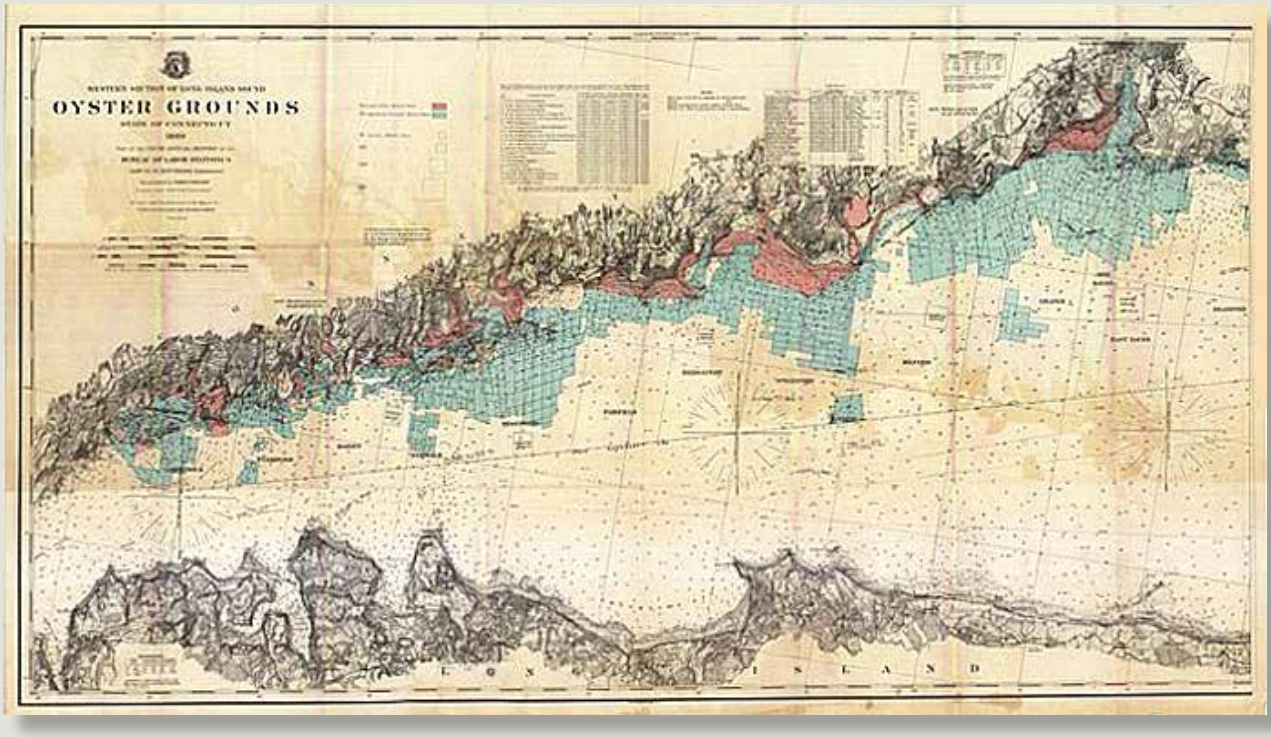
By the mid-1800s, local oyster harvesters began experimenting with planting oyster shells called "cultch" in shallow water to artificially catch and raise wild oyster seed or "set." In 1855, a Public Act known as "the two-acre law" provided towns the ability to grant individuals perpetual private titles 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

RESTORATION STORIES FROM AROUND THE STATE

Salt marsh replanted in Stratford

At Great Meadows Marsh, part of the Stewart B. McKinney National Wildlife Refuge, 44 acres of salt marsh and other important coastal habitat were restored. Construction began in October 2021, and close to 200,000 native coastal plants and shrubs have been added to the site by 32 “Salt Marsh Stewards” from Stratford and Bunnell high schools—with the help of crew leaders and over 150 volunteers. A new creek brought the natural flow of salt water in and out with the tides; grassy mounds were created to provide elevated homes for nesting saltmarsh sparrows; and two ADA-accessible viewing platforms were built.

— *Sharon Bruce, senior communications manager, Audubon Connecticut*



Thriving oyster beds in Fairfield

Ash Creek estuary is the site of a large and productive natural shellfish bed. In 1998, MSX disease, caused by a microscopic parasite, decimated the oyster population in Ash Creek and across much of Long Island Sound. Since then, the Fairfield Shellfish Commission has been committed to oyster habitat restoration through annual shell planting, and it has involved the community. Every September more than 700 Fairfield 7th grade school students plant shell. Most recently, Copps Island Oysters donated and planted 250 bushels of shell. Today, there are millions of oysters and a thriving oyster reef. Spat collectors there are covered, proving that restoration is succeeding! Ash Creek is our shellfish nursery.

—*Bruce Kueffner, chairman, Fairfield Shellfish Commission*



In with the chestnuts, out with the deer in Westport

The conservation team at Earthplace in Westport is constructing small deer exclosures throughout the forests to promote regeneration in the face of beech decline: beech leaf disease is killing off mature trees, creating large patches of sunlight on the forest floor. The overpopulation of deer in Westport is making it impossible for tasty native tree seedlings to fill those patches, clearing the way for unpalatable invasive plant species. To keep the hungry deer at bay and prevent establishment of invasive plants, deer exclosures were erected and American and hybrid chestnut seedlings donated by the Connecticut Chapter of the American Chestnut Foundation were planted inside. In 10 to 15 years, these deer exclosures will be removed and all that will remain will be young, healthy forest.

— *Nikki Spiller, director of the Harbor Watch program at Earthplace*





Better way for hikers in Barkhamsted

The Jessie Gerard Trail in Peoples State Forest in Barkhamsted offers some of the best views of the Farmington River Valley. But heavy use, erosion and trail widening have taken a toll. Since 2023, the Connecticut Forest and Park Association's Connecticut Woodlands Conservation Corps has worked to restore it. Over four seasons, CWCC crews installed 49 stone steps, water bars, grade dips, and a 10-foot stone-edged causeway. This August, the project wrapped up with a new 17-step stone staircase, replacing a failing wood crib step. Trail Manager Erik Landgraf, the Friends of American Legion and Peoples State Forest and the Connecticut Department of Energy and Environmental Protection partnered on the work. The trail is now durable and well-drained, built to withstand a changing climate and be enjoyed for decades.

— *Meaghan Strange, communications coordinator, Connecticut Forest and Park Association*



Eco Park in West Haven

For years, an overgrown tangle of invasive weeds and trees grew along one of the busiest stretches of West Haven's boardwalk—a highly visible section of coastline within the 40-acre conservation easement stewarded by the Land Trust of West Haven. After repeated coastal storms brought down trees and further destabilized the area, what had once been an overlooked eyesore became an environmental concern and a public safety liability for the city. But the Land Trust saw an opportunity that led to a project that transformed that space into Eco Park, spanning a 1.5-acre strip of public shoreline. Its mission is twofold: restore and maintain the area's ecological balance and engage and educate the public about the shoreline's ecosystem and why restoration efforts are important.

— *Marilyn Wilkes, president, Land Trust of West Haven*

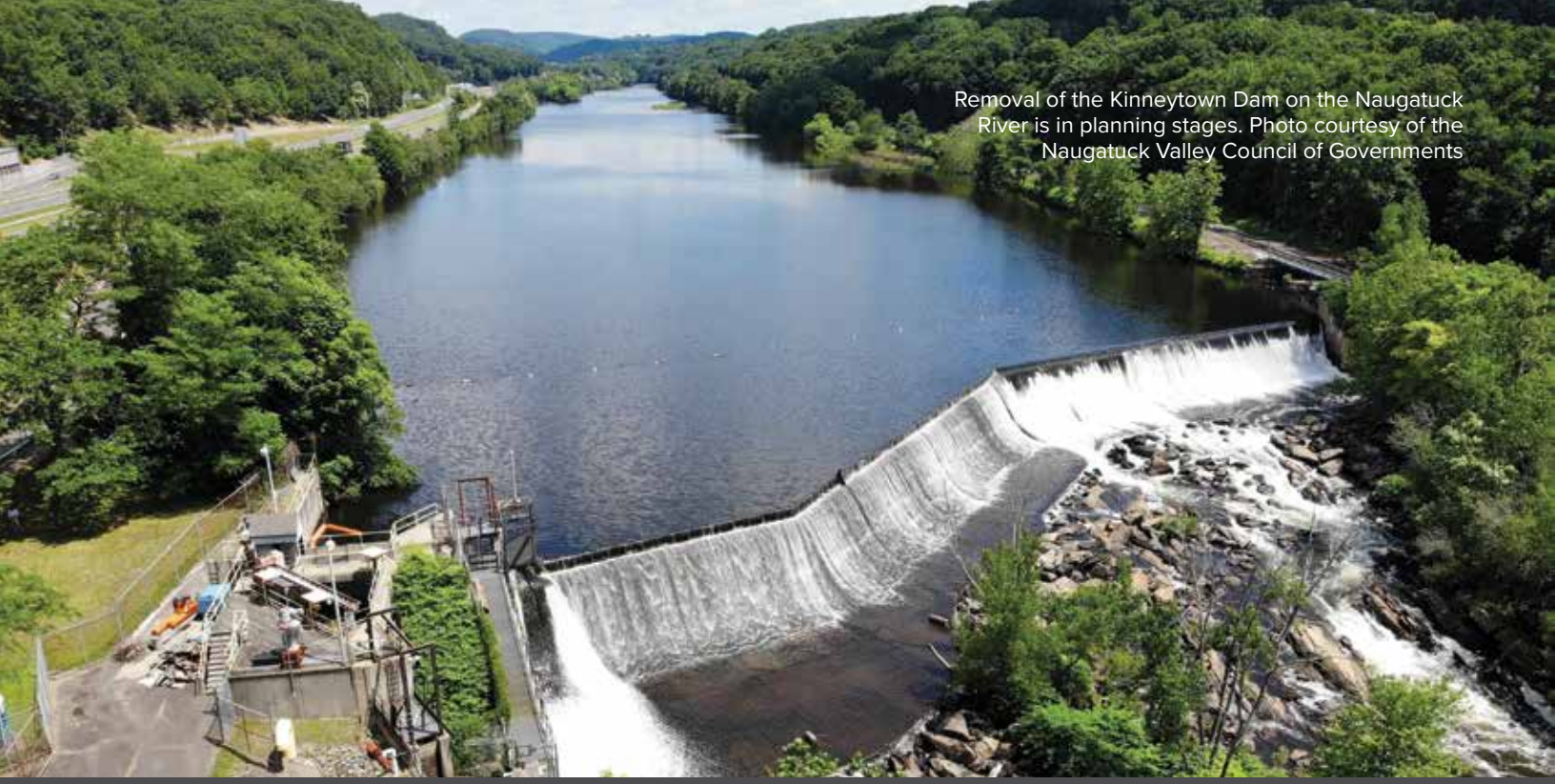


Living shoreline in Old Saybrook

The living shoreline at the Katherine Hepburn Preserve, Fenwick Borough, Old Saybrook was finished in 2021. The project restored the dune, Crab Creek, and a salt marsh and involved the installation of nine rock sills. The project was a collaboration of the Lynde Point Land Trust of community members who manage the site, with The Borough of Fenwick, GZA GeoEnvironmental, SumCo Eco-Contracting, Connecticut Sea Grant, the Connecticut River Conservancy, the state Department of Energy and Environmental Protection, U.S. Army Corps of Engineers and the Connecticut Institute for Resilience and Climate Adaptation. It was one of the first living shoreline projects in the state and received an award from the Connecticut Green Building Council in 2022.

— *Madeline Kolleger, Mitchell College assistant professor of marine and environmental science, who worked on the project as a graduate student*

Editor's note: These restoration stories were submitted to *Wrack Lines* in response to a request to readers in the previous issue.



Removal of the Kinneytown Dam on the Naugatuck River is in planning stages. Photo courtesy of the Naugatuck Valley Council of Governments

What's the dam problem?

How removing outdated barriers can reconnect Connecticut's rivers and restore fish passage

By Erica Casper

Most Connecticut residents probably pass a dam every day without realizing it. A small waterfall in a park. A pond behind a stone wall. A mill pond that looks as though it's always been there.

In reality, many of these features are human-made footprints of Connecticut's industrial past when dams were built to harness rivers for power, water, flood control and recreation. And with more than 4,800 dams, Connecticut has more dams per river mile than any other state.

The majority of Connecticut's dams date back more than 100 years, built before their impacts on rivers and wildlife were fully understood. Now, we know that dams can block fish migration, disrupt wetland habitats, contribute to warming waters in stagnant reservoirs and exacerbate flood risks during storms. In addition, these structures require costly maintenance as they age to keep them from disrepair and unplanned failure, a consequence that threatens public safety.

Most of these structures no longer serve their original need, yet impede efforts to restore rivers for wildlife and improved water quality.

"A lot of the dams in Connecticut are old hydromechanical power dams… they no longer serve a purpose," said Alex Krofta, a project manager with Save the Sound who oversaw the removal of Strong Pond Dam, commonly known as Dana Dam, on the Norwalk River. "They're completely obsolete. They're 8-track players."

A dam's environmental impacts become harder to justify once the dam no longer provides a useful function. That, coupled with concerns such as landowner liability, compromised water quality and fragmented ecosystems have led to increased efforts to remove outdated dams.

"When an impoundment is no longer serving a purpose, removal can have a lot of benefits," said Harry Yamalis, an environmental analyst with the Connecticut Department of Energy and Environmental Protection. "You can eliminate the liability associated with the dam while restoring more natural conditions in the river."

Since 2015, 147 river miles have been reconnected through the removal of 76 dams statewide. But there are still thousands of dams dotting Connecticut's rivers, highlighting an issue with no quick resolution.

Removing a Dam is More Than Taking It Down

Removing a dam can take years, even when there is broad support. A small, fairly simple dam removal project can



Dana Dam on the Norwalk River was built in the 1940s and was torn down in 2023. Photo: Alex Krofta / Save the Sound

cost a hundred thousand dollars or more, and requires multiple permits, plans and engineering designs. Removing a dam can also create new risks. For example, the release of contaminated sediment from behind a dam can have negative impact on downstream habitats. And without careful planning and skilled implementation, removal can lead to downstream flooding, at least in the near-term.

And though we most often think of the downstream effects, the area upstream of a dam removal also requires expert planning, calculation and design—when the slow-moving impoundment transitions back into a flowing river, any adjacent buildings or infrastructure must be shored up against new patterns of water flow and erosion.

The challenges don't mean defunct dams should be left in place. Instead, they illustrate why removal requires careful planning and why resources and grants from many organizations at the local, state and federal level can be critical.

Connecticut may have more than 4,800 registered dams, but each removal begins the same way: with one structure, one river, and a consensus that the status quo no longer makes sense.

Dana Dam in Wilton is one such example of a barrier that has now been removed. But the journey to get there was as winding as the river it reopened.

Dana Dam: Rebuilding a River

Dana Dam was built by Charles Dana in the 1940s to create a swimming and ice-skating pond for his children. The 250-foot-long, 11-foot-high concrete and earthen structure created an approximately two-acre-large impoundment. After the removal of Norwalk's Flock Process Dam in 2018, Dana Dam became the first barrier that fish encountered when swimming upstream on the Norwalk River from Long Island Sound.

Nearly two decades passed between the first discussions about removing Dana Dam and the day the river flowed freely through the site once again. Early plans stalled, support had to be rebuilt, and years of design and permitting followed. By the time the structure finally came down in 2023, the design team had spent years planning and permitting, and construction crews had spent months reconstructing the former impoundment into a river channel.

Part of that work involved rerouting the existing main channel to a secondary channel that moved the waterway away from an adjacent railroad embankment. With that came a need to control erosion and stabilize the new river corridor. Engineered "grade control riffles" were installed to mimic natural riffles and maintain channel stability. These are shallow, rocky sections of streams where water tumbles over stones. Large rocks and vegetation were used to stabilize the riverbank and keep sediment in place. And the project didn't stop when the structure came down. Ongoing management includes engineering inspections, ecological monitoring and invasive species control.

For Dana Dam, like many others, one of the main goals was to restore fish passage. Migratory fish such as river herring, American eels, and sea lampreys depend on connections between Long Island Sound and freshwater rivers and streams during different parts of their lives. A dam can interrupt those journeys entirely. While restoring any opportunity for fish to migrate across what was once a complete barrier to them can be considered a success, Krofta explained that the Dana Dam removal opened the way as completely as possible.

"There are some sites downstream that may still be partial barriers: old dam remnants, sections of disturbed channel, some utility armoring, bridges and culverts. The site that we've restored, the Dana Dam removal site, should not be



A backhoe tears into the concrete wall of Dana Dam. Photo: Melissa Pappas / Save the Sound

a partial barrier at all," Krofta said. "That should be zero barrier."

Sea lamprey have been spotted by Trout Unlimited volunteers upstream from the removal site, an encouraging sign. Save the Sound recently completed its first round of environmental DNA (eDNA) sampling. Samples collected above the restoration site have confirmed that herring are indeed moving through the restored river corridor, into reaches of the Norwalk once inaccessible. Additional years of eDNA sampling will follow, along with attempts to observe and document herring firsthand.

"I want to see them," Krofta says. "I believe they're here now, but I still want to see them."

Not Just a Fish

For Krofta, the significance of the dam removal extends beyond individual fish species.

"That's not just a fish, that's an ecological process," he said. "That's a massive influx of marine biomass upstream into freshwater, laying eggs, reproducing, feeding every creature that is on the banks and in the stream already."

In other words, restoring fish passage also restores connections within the larger ecosystem. Fish moving between Long Island Sound and freshwater rivers transport nutrients, become food for other wildlife and help reconnect ecological processes that dams interrupted.

Kinneytown: Removing a Barrier on the Naugatuck

Elsewhere in Connecticut, another dam on the cusp of removal illustrates the potential benefits of removal and challenges in getting there. Kinneytown Dam in Seymour spans the Naugatuck River, a 40-mile waterway that once powered manufacturing centers in Torrington, Naugatuck and Waterbury. Kinneytown was built in the mid-1800s and provided power for nearly two centuries.

Connecticut began investing heavily in restoring the Naugatuck River in the 1990s, after decades of industrial pollution. Those efforts included bringing migratory fish back to the river and resulted in the construction of a fish ladder at Kinneytown Dam. The hope was that the ladder would allow fish to travel upstream while the dam remained in place. But monitoring showed that the ladder was not working effectively, with virtually no migratory fish successfully making the trip upstream.

That discovery started discussions around 2018 about how to improve the fish ladder or build another way around the barrier. Then the equation changed. The last remaining hydropower station went offline in 2020, with no plans to restore it. The conversation changed from fixing the passage to removing the dam.

"We started realizing around then that the best and only way to really restore fish passage would be to remove the dam," said Aaron Budris, environmental planning director of the Naugatuck Valley Council of Governments. "And removal will also remedy numerous other problems that the dam is causing."

Paul Woodworth, senior director of ecological restoration at Save the Sound, agreed.

"If it's not going to produce power, then all it is is an environmental impact," he said. "If it was producing power, then the environmental impact might be justifiable. But if it's no longer producing power, then it's no justification for its environmental impact."

The project is also part of a much larger transformation of the Naugatuck River.

“At one time, not that very long ago, it was probably one of the most polluted rivers in the country, and just since the 1970s to now, the comeback that it’s made is just unbelievable,” Budris said. “Removing Kinneytown Dam could be the last big project to really bring the river all the way to its potential.”

The Next Step Takes Time

Like Dana Dam, Kinneytown demonstrates that deciding whether a dam should come down is much easier than actually removing it.

Before demolition can begin, engineers must address two major challenges: contaminated sediment accumulated behind the dam and sewer infrastructure buried within those sediments.

“Sediment can build up behind a dam for decades, and if that sediment is contaminated,” said Yamalis, “dealing with it can become one of the most expensive parts of a removal project.”

Both the sediment management and sewer relocation projects are now in the planning and preparatory stages, with work expected to begin as early as 2027. Removal of the dam itself could follow as early as 2028.

Reconnecting Connecticut’s Rivers

Connecticut’s dams are part of its history. Many powered mills, factories, and communities and helped shape the state that exists today. But rivers change, communities change and the purposes those structures once served can disappear.

That is what makes Krofta’s comparison to an 8-track player fitting. Something can have been useful once without remaining useful forever.

Removal may not be the right answer for dams that still provide important benefits. But where a dam no longer serves a meaningful purpose, removing it can provide an opportunity to restore something that has been missing for generations: a connected ecosystem.

“When you remove a barrier, you’re not just restoring fish passage. You’re restoring aquatic organism passage, more natural sediment movement and, in many cases, a more natural river channel and surrounding wetlands,” noted Yamalis.

Dana Dam shows what that can look like. A former barrier is now a river corridor where fish can move freely and ecological processes can begin to reestablish themselves. Kinneytown could bring the same kind of change to the Naugatuck River on a much larger scale.

One dam removal will not reconnect all of Connecticut’s rivers. But each barrier removed restores another piece of the system, opening river miles, reconnecting habitat, and giving migratory fish access to places they have been unable to reach for decades or even centuries.

For a state with thousands of dams, restoring Connecticut’s rivers will happen by removing one barrier at a time.



The Norwalk River now flows freely through the site where the Dana Dam once stood.
Photo: Alex Krofta / Save the Sound

10 Questions with Doug Tallamy

Editor's note: Douglas Tallamy, a professor of entomology at the University of Delaware, is one of the nation's leading experts on native plant gardening. He has authored several books, is a frequent public speaker and was featured in an article in The New York Times Magazine last summer. At the Hartford Flower Show last winter, he packed a double room with fans eager to hear his wisdom and anecdotes from his own mistakes and successes at his 10-acre property in southeastern Pennsylvania. In early July, he took time out of his busy schedule for a phone interview with Wrack Lines.





Left: Doug Tallamy. Photo: Rob Cardillo

Above: Some of the wildlife now found at Tallamy's property in Pennsylvania includes Eastern bluebirds, the rose maple moth, and the white blotched heterocampa moth, seen here its larval stage. Photos courtesy of Doug Tallamy

1. When I heard you speak at the Hartford Flower Show in February, you urged the audience to put more of their efforts into restoration of natural spaces over conservation. Would you talk more about that?

The conservation model for the last century was to conserve what was not destroyed. We still want to do that, but the model of conservation is not good enough. We keep developing and developing in a way that excludes natural ecosystems. We have to start thinking about ecosystem function as part of our landscapes. The objective should be to restore viable ecosystems in between the parks and preserves that are already protected. And in so many places, there is nothing left to conserve. But we can't afford to give up. Restoration has to be part of the future, not to replace conservation efforts but to add to them.

2. The notion of restoration can be difficult, because people are unclear what the standard should be. What baseline should they be working towards when they look to restore a natural space?

All ecosystems change over time, so there is no one point we're trying to restore to. The goal should be to increase the ecosystem function, the ecosystem production, and it's a continuum. You can always make it better. But what you have to do is start. Planting one tree is better than no tree. There are four ecosystem responsibilities we have for our yards. The first is to sequester carbon. The second is to support the watershed. The third is to support pollinators. And the fourth is to support a viable food web. A lawn does none of those things.

3. Where do you see the biggest potential for restoration projects?

We have to look at reducing our lawns. We've got 44 million acres of lawn in this country, about the size of the area of New England.

4. If you were a homeowner with a small yard, and wanted to start restoring its ecosystem function, how would you begin?

If I lived east of the Mississippi, I'd plant a tree appropriate for the area, an oak tree. A dwarf chinkapin oak is a good species for a small yard. It will attract caterpillars that are food for birds, make acorns that are food for other animals, help the watershed and help pollinators. I'd also look at how I can reduce the lawn, by putting in a pollinator garden with goldenrod, perennial sunflowers and other plants that will bloom from spring through fall. A bottlebrush buckeye is a good plant that attracts pollinators. If you can't find one at your local nursery, ask them to get it, and if they don't go somewhere else. Don't settle for something else. We're trying to push the nurseries to stock more native plants.

5. What was your own experience with restoring your yard like?

We're still working on it. We moved in in 2000 and I was surprised with how fast it went. We've turned 10 acres of land that was mowed for hay into a forest. Now I joke that I garden with a chainsaw because the trees I have planted have grown so much. I also have to keep after the invasives that keep moving in. Japanese stiltgrass has moved in and that's really tough to get rid of. Another thing that's really challenging is the overabundance of deer. I have to cage everything I plant so the deer don't eat it. The deer problem and the invasives problem are closely linked, because the deer only eat the natives.
But the rewards have been enormous. I've found 1,378 species of moths here, and that is food for 62 species of birds that have bred on our property. I've found gray tree frogs, and the wood frogs have moved back in. Restoration works. That's the reason I'm doing what I do.

6. What's the role of getting rid of invasives in the restoration process?

You can fight the invasives and start planting natives at the same time. Even if you have a thoroughly invaded area, you can get rid of the big bundles. Get rid of the woody ones like autumn olive, barberry and burning bush by sawing them off at the base and applying an oil-based herbicide at the base with a paintbrush. Some of the invasives like Japanese knotweed are really hard to control if you don't use herbicides, but you have to use them correctly. I think herbicides are like chemotherapy, and invasives are like tumors that are out of control and are killing the rest of the ecosystem.

7. Is there a book or website you would point people to as a guide for restoration projects?

Homegrownnationalpark.org is a website we started in 2020.

8. While the idea of planting natives and reducing lawns is catching on, where are you still seeing the most resistance and how can it be overcome?

It is catching on faster than I thought it would, but there is still the misconception that native plant gardening is messy. You can use native plants in a formal design. The people who insist on putting a messy meadow in their front yard don't help. We can use smaller lawn spaces as cues for care, to line pollinator beds. In general, we want people to plant more plants than the typical yard has. About 70% of plants in a yard should be native. The other 30% can be non-native, non-invasive species.

9. Are there particular institutions or sites you would point to as leaders in native landscaping or that have model restoration projects?

Mentor Marsh in Ohio had 811 acres of phragmites that was destroyed with herbicide and now it's a thriving freshwater marsh, with threatened plants now living there. All the major arboretums are recognizing the value of natives. And the New York and Brooklyn botanical gardens both have big native plant sections.

10. How do you keep from getting discouraged?

This is going to work because the public is buying into it. The enthusiasm at my talks just keeps growing. What they're excited about is being empowered to be part of the solution.

What's in our names?



The wrack line along the concrete seawall on Shore Road in Groton is dominated by eelgrass blades, indicating that eelgrass beds are located offshore. Photo: Judy Benson

What are wrack lines? The word wrack is a term for various kinds of seaweed, and wrack lines are the collections of organic matter (sea grass, shells, feathers, seaweed and other debris) that are deposited on shore by high tides. More generally, wrack lines are where the sea meets the land.

With our magazine *Wrack Lines*, we tell stories about the intersection of the land, sea and Connecticut Sea Grant. So what is Connecticut Sea Grant? One of 34 Sea Grant programs across the country, it helps residents make the most of our coastal resources and inland waterways. It addresses the challenges that come with living by the water or within the Long Island Sound watershed, in a state with 332 miles of shoreline and three major tidal rivers.

This NOAA-state partnership based at UConn's Avery Point campus works with aquaculture farmers, fishermen and seafood purveyors to help their businesses prosper. It funds research essential to understanding and managing our changing coastal and inland environments. It provides communities and local leaders with the information they need to make better land and shoreline decisions that result in more resilient communities and healthier watersheds. It educates students as well as teachers and adults of all ages about the marine environment.

Connected to experts and residents who live, work and recreate in the Sound and its watershed, it brings varied interests together around a common purpose of working for mutually beneficial solutions to problems. Small in staff but big in impact, Connecticut Sea Grant is like a pilot boat that navigates the way for large vessels toward safe harbors. Since 1988, Connecticut Sea Grant has supported "Science Serving the Connecticut Coast."



Eelgrass blades seen in an underwater meadow. Photo: Zachary Lane

Cayla Sullivan of the Environmental Protection Agency holds eelgrass blades harvested while diving in Long Island Sound. Photo courtesy of Cayla Sullivan

An eelgrass renaissance takes hold in Long Island Sound

By Judy Benson

Picture a lush green meadow. Blooming amid the swaying grass are lavender bee balm, pumpkin-hued butterfly weed and purple milkweed, offering nectar to passing monarchs, dragonflies and damselflies. A goldfinch lights on a nearby tree branch.

Now imagine a similar scene underwater. Sinuous emerald stalks swing with the tide. Baby flounder and striped bass swim through. A seahorse, pipefish and a bay scallop slink between the blades. Such eelgrass meadows exist, unseen by most, at several spots in Eastern Long Island Sound—Pine Island and Mumford Cove in Groton, DuBois Beach in Stonington and the Niantic River among them—but are not as common Sound-wide as they once were. This keystone species is now, however, the focus of multiple projects to protect and expand its presence.

“I am ecstatic,” said Cayla Sullivan in response to a question about the current state of eelgrass in the Sound.

Sullivan is an Environmental Protection Agency watershed management specialist who serves as habitat and reporting coordinator for the Long Island Sound Partnership, a network of collaborators including Connecticut Sea Grant that focus on the estuary shared by Connecticut and New York.

“We’ve come a long way since we first started in 2021,” Sullivan said.

Expanding eelgrass habitat, she explained, has long been a priority for the Partnership. But for most of that time, the conditions weren’t right. A few attempts were made, but failed. Improvements in the Sound’s water quality over the last three decades, thanks largely to reductions in nutrient loading from sewage plant discharges, have set the stage for the current infusion of funding, energy and enthusiasm for eelgrass restoration. Early signs are promising.

Sullivan is the lead author of the document guiding much of that work, the 2022 “Long Island Sound Eelgrass Management and Restoration Strategy.” But many others have contributed to laying the foundation for that strategy, and to the progress made since. Among them is Jamie Vaudrey, UConn marine science research professor and research coordinator at the CT National Estuarine Research Reserve (CT NERR), based at the Avery Point campus.

“I consider myself an ecosystems ecologist, and I’ve been interested in eelgrass as an indicator of water quality since I was a graduate student,” she said. “There’s been work on improving water quality in the Sound for the last 20 to 30 years, and now we’re at the point where it makes sense to start doing eelgrass restoration.”

Vaudrey’s long-term involvement with eelgrass intensified this summer, when a restoration project she is overseeing



Divers from the CT National Estuarine Research Reserve board a skiff to harvest seed-bearing eelgrass blades offshore from the UConn Avery Point campus for a restoration project.
Photo: Judy Benson

got into full swing, and she led two educational boat tours for the public focusing on the aquatic plant.

“Eelgrass is found where the water is clean and the light can reach the bottom,” she told the passengers, as the vessel’s captain, Rob Grove, steered out of the mouth of the Thames River. They headed towards Pine Island, part of the UConn Avery Point campus where a healthy eelgrass bed grows just offshore. “It means it’s a good place to swim.”

A short environmental history lesson followed. Passengers heard how eelgrass was once widespread throughout Long Island Sound, until a wasting disease in the 1930s nearly wiped it out. Surviving patches struggled to regrow, due to excessive nutrients coming from sewage discharges that continued through the 1970s.

“Then we have what we call the environmental awakening, when there was much more focus on improving the air and water quality, and states started to invest in sewage plant upgrades. Now, eelgrass is doing well in eastern Long Island Sound.”

Vaudrey told of one recent success story: in Mumford Cove, where the eelgrass *Zostera marina* returned after waste discharges were removed from the waterway. A second story from Smith Cove in the Niantic River showed early indications of a second eelgrass species, *Ruppia maritima*, returning following conversion of septic systems to a sewer system.

Like a green necklace, eelgrass grows in a narrow band along the coast and around islands in shallow water, typically no more than 10 feet deep depending on water clarity. It now covers about 2,000 acres of near-shore waters, and restoration advocates are looking to double that within the next decade.

Lauren Barrett, associate research scientist at the CT NERR, is leading an ambitious eelgrass restoration project that builds on the foundation laid by Sullivan, Vaudrey and others. It requires a team of divers and snorkelers who swim into healthy eelgrass beds to collect seed-bearing shoots, then separate out the seeds for mass broadcast planting at carefully selected sites in the fall. She and her team are learning and adapting as the project progresses, and anticipate there will be some trial-and-error along the way as they develop their skills and capacity.

“For every 100 seeds we plant, we expect one to five plants to grow,” she said.

The project’s long-term goal, she said, is to establish a seed bank for eelgrass restoration projects Sound-wide.

“We want to become the hardware store for eelgrass seed,” she said. “We’re trying to do something big.”

Another part of the project is educating boaters about the importance of eelgrass and their role in protecting it. Outreach messages to power boat operators will urge them not to anchor in eelgrass meadows, to slow down in shallow water, and to avoid running propellors through eelgrass beds, which uproots the plants.

A few miles from Barrett’s base at the docks and labs of UConn Avery Point, Connecticut College Biology Professor Maria Rosa leads another eelgrass restoration project. While she and UConn doctoral student Zachary Lane dove through an eelgrass meadow at a public beach in Stonington to collect reproductive shoots, Connecticut College students Sasha Jansujwicz and Sadie Joseph snorkeled through with equipment to measure the beds.

“This is one of our donor meadows,” Rosa said of the site. “We’re looking to do restoration at three sites.”

One is on the Indian River in Clinton and Madison, another is at Duck Island in Westbrook and the third is on the Thames River, just offshore from Connecticut College’s Athletic Center. She and her crew will use three different techniques, and evaluate which works best: broadcast seeding, launching “seed bombs”—clusters of seeds wrapped in rice paper—or using clams as farmers. In this method, biodegradable glue is used to apply seeds to live clams, which are tossed into the water and plant the seeds as they settle sthemselves into the sediment.

“Eelgrass restoration is very site-specific,” she said. Timing of seed production, optimal planting time and water temperature is unique for each bed.

Rosa and her crew filled a cooler with eelgrass shoots that day. Later, they were delivered to Mystic Aquarium, where volunteers would sift through them to extract the seeds.

“So many people are getting involved in this,” she said. “It’s been great.”

Dozens of volunteers are also working with the nonprofit Save the Sound on its four-year-old eelgrass restoration



Zachary Lane, a UConn doctoral student, dove with Connecticut College Professor Maria Rosa to harvest seed-bearing eelgrass shoots for a restoration project. Photo: Judy Benson

project focusing on Duck Island and Clinton Harbor. The volunteers gather for what are likened to "big arts and crafts parties," where they sit at long tables glueing seeds to clamshells.

"It's become really popular for our volunteers," said David Seigerman, communications specialist with Save the Sound. "It's hands-on, personal action."

Soundkeeper Bill Lucey, Save the Sound's hands, eyes and ears on the estuary, distributes the seeded clams in the fall from his 25-foot patrol boat after the gluing at the Cedar Island Marine Lab.

"We planted almost 300,000 seeds and 40,000 clams last fall, and when we flew a drone over those areas in the spring the sparse eelgrass areas were almost completely filled in," Lucey said. "At Duck Island, the size of the eelgrass bed had increased 178% over the previous year." (He added that these are preliminary results.)

Lucey has set his sights on locations in Branford and Greenwich for future plantings, after determining their suitability based on water quality and other factors. But he knows the kind of success he saw at Duck Island isn't a certainty.

"There are so many variables that can cause eelgrass plantings to fail," he said.

He, Barrett and Rosa also agree that eelgrass restoration work will never be finished. Existing beds need to be monitored and protected so they stay healthy. Warming water, changing water chemistry and severe storms all pose ongoing threats.

"We want to have self-sustaining meadows, and catch any that are in decline and work to build up the density," said Rosa.

Benefits of eelgrass:

- Provides nursery habitat for finfish and shellfish
- Traps sediments and nutrients
- Sequesters carbon, mitigates acidification
- Improves oxygen concentration in the water
- Prevents shoreline erosion

More Information:

"Diving into Long Island Sound's Seagrass Meadows" StoryMap:

https://storymaps.arcgis.com/stories/232ad1570c3f4f2cabbb6a8ea8440f55

Long Island Sound Eelgrass Restoration Strategy:

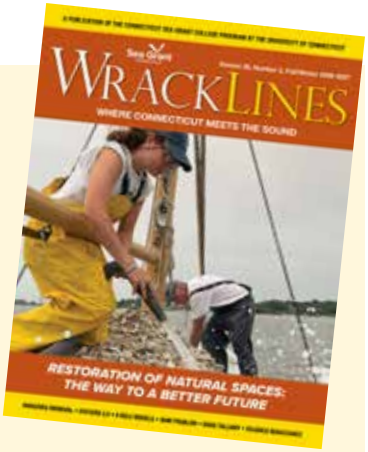
https://lispartnership.org/long-island-sound-eelgrass-strategy/

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Jack Matthias of Audubon CT, left, shows a group one of the culverts slated for replacement as part of a restoration project at Hammonasset Beach State Park that will benefit its salt marshes, including the one seen here in September.
Photo: Judy Benson

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