

Blocking the Herring River a century ago brought disastrous ecological consequences. Now, officials want to resurrect it.

Federal and state officials launch one of the nation's largest ecological restoration projects in Wellfleet

By [David Abel](#) Globe Staff, Updated July 27, 2022, 6:58 a.m.



Tim Smith (right) and Petra Zuniga studied a sectioned off treatment area of salt marsh grass on the Herring River in Wellfleet. A restoration project by the state to restore the natural tidal flow to the Herring River estuary to improve the water quality and wetlands habitat. John Tlumacki/Globe Staff

WELLFLEET — A century ago, in an effort to lure tourists, the residents of this seaside town near the tip of Cape Cod sought to reduce the scourge of mosquitoes. To do that, they built a massive dike to block the tidal flow of saltwater into the Herring River, a vibrant estuary believed to be a major breeding ground for the voracious insects.

Over the years, however, it became clear that there were disastrous ecological consequences for blocking the river, with little reduction in mosquitoes.

Its annual herring run, once among the largest in New England, collapsed. Oysters and other shellfish were contaminated. Invasive species consumed the vast expanse of marshland, acidifying the peat and destroying its ability to absorb significant amounts of carbon. It could also no longer serve as a nursery for a range of species, including the small fish that feed on mosquito larvae.

By the turn of the century, after state officials determined that the water quality had become so impaired that it violated the Clean Water Act, local, state, and federal officials decided they should fix the problem.

Now, after years of studies, they're planning a \$70 million effort to bring back as much of the natural flow of the river as possible — the largest such restoration project in the Northeast. In addition to reclaiming more than 1,700 acres of habitat, the project aims to improve the area's ability to withstand climate change by restoring its vital marshlands.



Water from the Herring River rushed under the antiquated dike on Chequesett Neck Road as the tide shifted to low tide. John Tlumacki/Globe Staff

“The entire ecosystem has been thrown out of harmony,” said Brian Carlstrom, superintendent of the Cape Cod National Seashore, which oversees most of the land. “Restoring the tidal exchange will correct that.”

There has been some pushback against the plan, especially among those in the town’s lucrative shellfish industry.

They’ve raised concerns about how the newly restored tides might spread large amounts of sediment and bacteria downstream, particularly along the oyster beds in Wellfleet Harbor. They’ve also voiced fears about the potential for the tidal flow to create openings through The Gut barrier beach that connects Great and Griffin Islands. If the river had a more direct link to Cape Cod Bay, they worry that could change the salinity and temperature of the harbor, potentially harming their shellfish.

“There are absolutely potential risks, and some big unknowns,” said Alex Hay, owner of the Wellfleet Shellfish Co. “They’ve done advanced computer models studying these potential impacts, but we don’t know. It’s a crapshoot.”

Despite his concerns, the benefits of the project are greater than the risks, he and other shellfishermen said. Bringing back herring alone, they noted, could have tremendous benefits for the wider ecosystem, especially for larger fish, such as the long-depleted cod and haddock stocks, that feed on them. The restoration project should also open up acres of new commercial shellfish grounds for oysters, clams, and razor clams.



Tim Smith (right) and Petra Zuniga studied a treatment area of salt marsh grass on the Herring River. John Tlumacki/Globe Staff

In a letter this spring to selectmen, the town's Shellfish Advisory Board said members voted unanimously to support the project. "We believe the science is in, and the ecological, economic, and social benefits of restoring a more robust tidal flow . . . make proceeding ahead with this ambitious project the proper course of action," the board wrote.

There are other concerns about the project, which will remove some 126 acres of trees and 78 acres of woody shrubs that have grown along the meandering path of the forlorn river. Many of those trees have already died, often as a result of rising sea levels pushing up ground water and drowning root systems.

While some worry about the carbon impact of removing all those cherry and locust trees, Carlstrom said they plan to use their remains as "biochar," a residue from the chipped wood that he said will be scattered throughout the area to spur the growth of new, ecosystem-friendly vegetation.

"Any project of this magnitude will have some critics," he said. "It's a significant change, returning an impaired ecosystem to a healthy one."



Dead cherry trees rose from the wetland area off Pole Dike Road where rising high tides from the Herring River have killed many trees. John Tlumacki/Globe Staff

The first step of the restoration project, which is being financed with a mix of public and private dollars, will be the demolition of the existing dike over the coming year. It will be replaced with a \$31 million bridge that will allow far more water into the river and a tide-control system that will allow the water and salinity levels to rise gradually over the coming decade, enabling the ecosystem to grow back more naturally.

The return of the tidal flow should lead to a resurgence of the river's herring run, which once amounted to some 200,000 of the smooth, silvery fish making their annual journey to spawn in inland ponds, the project's proponents said. The surge of saltwater should also create conditions for a boom in the area's threatened species, including salt marsh sparrows, eastern box turtles, diamondback terrapins, and water willow stem-borer moths, they said.

"The restoration project represents an opportunity of a lifetime," said Martha Craig, executive director of the Friends of Herring River, a local advocacy group.

The project's proponents say it will also have significant climate benefits, noting that the degraded ecosystem has emitted an estimated 730,000 metric tons of carbon dioxide into the atmosphere since the dike was built in 1909. The area's methane emissions, they add, are nearly 15 times higher than those in natural marshes.



Tim Smith (left) and Petra Zuniga studied a treatment area of salt marsh grass on the Herring River. John Tlumacki/Globe Staff

Those emissions are mainly a result of the breakdown of the area's carbon-absorbing peat and grasslands. As they're exposed to more oxygen, microorganisms more rapidly break down soil and release more carbon dioxide and methane, the primary greenhouse gases warming the planet.

The regular flushing of the tidal waters should help restore the area's peat and grasslands, absorbing much more carbon dioxide and methane, proponents say. It should also serve as a more resilient buffer to the town's roads and homes from rising sea levels.

The lessons learned from the project should apply to salt marshes around the world, said Kevin Kroeger, a research chemist with the US Geological Survey in Woods Hole. He noted that there are more than a million acres of tidal wetlands in the United States with similar problems as the Herring River.

"This project will be the first time we demonstrate, on such a scale, that we can improve the ability of wetlands to absorb carbon dioxide, reduce methane emissions, and provide other climate benefits," he said.

The return of the river should also be good for tourism, opening up new areas to kayaking, fishing, and other forms of recreation, local officials say.

"Tourism is our flesh and blood here," said Richard Waldo, the town's administrator, noting that visitors account for \$11 million annually to the local economy, which is almost half of the town's operating budget. "People come here for the waters, the beauty."

While six properties will be affected by the increased flow of the river, the owners will be compensated for the cost of moving or elevating them, he and others said. The largest property affected by the project is a nine-hole golf course owned by the Chequessett Club. State and federal officials will be covering the nearly \$7 million cost of elevating five of the low-lying holes and nearby roads.

Barry McLaughlin, the club's general manager, said they support the restoration project, even though it means the golf course will have to close for a year.

“We’re looking at the long-range picture,” he said. “When we get bad weather, those holes flood now. So we see this as giving us many years without flooding issues.”

Waldo’s only real concern is whether Wellfleet has the staff to oversee such a big project.

“We need to have a team on board to be the eyes and ears of Wellfleet,” he said. “At the end of the day, this affects our residents.”

Carole Ridley, a local environmental consultant coordinating the many organizations involved in the project, said the river’s restoration should also reduce the mosquito population, which [surged](#) last year in parts of Wellfleet when the bay washed over a barrier beach and left a pool of saltwater in a marsh along Duck Harbor.

The new tidal flow, she said, would allow for the return of more of the fish that feed on mosquito larvae.

But the ultimate benefit of the river’s restoration, she said, is that it will show that communities can right their environmental wrongs.

“Nature has an incredible potential to heal,” she said.

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