

ENVIRONMENT

Marines invest in restoring NC shoreline

A project funded by the Department of Defense will make the NC shoreline more resilient against severe weather and protect fragile ecosystems.

by Jack Igelman • December 14, 2020



Living shoreline at Whittaker Pointe, in Pamlico County, across the river from Cherry Point. Photo Courtesy of the NC Coastal Federation.

The Marine Corps is partnering with state and national organizations to form the longest living shoreline rehabilitation project on the North Carolina coast.

The U.S. Department of Defense's Readiness and Environmental Protection Integration, or REPI, program announced a \$1 million award last month to fund the planting of 2,100 linear feet of living shoreline along the Neuse River bordering the Marine Corps Air Station Cherry Point, 18 miles southeast of New Bern.

The project will link to an additional 5,600 linear feet of shoreline slated for repair along the river and matched by an additional \$8 million in funding. The military is working with the Pew Charitable Trusts' conservation efforts, Duke University and the N.C. Coastal Federation.

The headwaters of the 275-mile-long river form west of Raleigh. Near New Bern, the banks swell, forming a slow-moving estuary as the river creeps into Pamlico Sound. At its broadest, near Cherry Point, the river is 6 nautical miles wide.

Addressing weather challenges

The project will transplant natural flora and fauna to the banks of the Neuse River so its waterfront is more resilient to the impact of severe weather.

Jessica Guilianelli, MCAS Cherry Point natural resources manager, said Hurricane Florence in 2018 accelerated erosion along the river's shoreline.

Wave energy from north winds, she said, batter the shoreline, causing significant erosion. "We are looking closely at our resilience to water, wind and natural phenomena that are inevitable," Guilianelli said.

Commissioned as Cunningham Field in 1942 for coastal defense during World War II, the airfield also trained Marines for the Pacific

theater. MCAS Cherry Point public affairs officer 1st Lt. **Aaron Ladd** said the location of the base was selected because of its high volume of calm weather.

Yet, the area is also prone to violent hurricanes. Among them was Florence, which made landfall Sept. 13, 2018, then followed a slow path inland that unleashed a torrent of rain and wind in areas along the central coast.

Recorded rainfall near Cherry Point included 17 inches in New Bern, 25 inches in Newport and 33 inches in Swansboro. In addition, the storm's runoff poured into the Neuse. Combined with the tidal surge, the runoff battered the base shoreline.

The air station is still recovering. In all, Ladd said, 245 facilities and structures were damaged as well as land along the Neuse shoreline.

At risk, Ladd said, is the ability of the military to conduct its mission to provide a combat-ready aerial strike force. The erosion threatens recreational facilities and housing, and impacts ground training and operational capabilities.

"Mission comes first, but our responsibility is to preserve our resources and leave it better than we found it," he said. "The Marine Corps has a commitment to excellence to everything we do."

Funding the project

Initial funding to aid the base's recovery arrived in 2019 when President **Donald Trump** signed a \$19.1 billion disaster relief bill to fund recovery in areas impacted by the hurricane.

Funding from the REPI program is intended to finance projects that protect, restore and support base natural infrastructure recovering from extreme weather-related events possibly caused by climate change.

According to an October publication from REPI, there is growing concern “over the impacts on DoD installations and readiness activities resulting from severe weather and other conditions exacerbated by the current or anticipated impacts of climate change.”

The funding is focused on addressing threats that can limit or restrict military training, testing and operations. Additionally, the program’s mission is to leverage partnerships with other land use groups and researchers.

Among them is the Pew Charitable Trusts, said **Leda Cunningham**, the foundation’s officer of conserving marine life in the U.S. initiative, based in Morehead City.

The charitable organization recently shifted focus from offshore marine projects to inshore coastal habitats, Cunningham said. The Cherry Point project provided an on-the-ground laboratory for its support of a Duke University initiative to restore eastern oysters in estuarine habitat.

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Duke Restore, an initiative focused on coastal ecosystem restoration and cultivation, forms teams of policymakers, funders and resource managers to address complex ecological problems, said **Brian Silliman**, Duke professor and initiative director.

Their first initiative was to form a shoreline restoration team. Silliman's marine biology conservation lab will participate in the Cherry Point project by testing whether oysters can survive along the shoreline.

"When you have a mudflat, it's hard to grow an ecosystem," he said. "We discovered that seagrass grows better with oysters around the roots."

Oysters fertilize and stabilize seagrass, and eventually the plants and oysters form reefs and marshes, which protect the shoreline, he said. "Oyster reefs are among the most decimated ecosystems on planet Earth."

Oyster reefs, he said, have decreased in mass by 90% globally due to overharvesting by humans, disease and pollution. Additionally, salt marshes and other coastal habitats have been degraded by development and erosion caused by rising sea levels and storm waves.

The importance of a sustainable future

Silliman said finding solutions on a large scale is more urgent than ever due to the cumulative impact of coastal development, water quality, declining fisheries and the potential for rising seas and more intense storms resulting from climate change.

Strengthening the shoreline will protect Cherry Point operations and coastal communities from storm surges, waves and flooding. A living shoreline will also absorb carbon dioxide, filter water pollution and provide habitat for ecologically and economically important marine life.

Still, there is no guarantee that the oysters will thrive. All sorts of factors, such as altered water salinity, predators, waves and increasing sea levels may all have an impact on the ability of oysters to colonize.

The experiment will aid future designs that are more durable and effective, **Carter Smith**, a postdoctoral marine scientist at Duke, said. The knowledge, she said, can be leveraged in other restoration projects along the North Carolina coast at a larger scale.

“With restoration projects, you don’t often have the time and luxury to test what’s going to work before you do it. So, these experiments are helping us answer questions about what will work before construction starts,” she said.

Cunningham of Pew said the partnerships on this project “hold promise” by facilitating natural scientists’ understanding of shorelines and how the knowledge can be applied to other situations.

“This project will lead to more collaboration and conservation of coastal resources. That will have implications across the state about how to use nature-based solutions to enhance ecological solutions.”

Though this project will have direct benefits to preserving the corps’ shoreline, there are broader implications that impact coastal communities and visitors.

There is a strong link between resilient shoreline and healthy habitat with water quality and a thriving fishery. Both are meaningful for a coastal economy that relies on tourism and recreational and commercial fishing.

The N.C. Coastal Federation in Newport has been promoting living shorelines for two decades along private and public properties, including two recent projects in Oriental, on the Neuse, and in Atlantic, a small community on the Core Sound, **Lexia Weaver**, an ecologist with the organization, said.

The NCCF will work with the partnership to design and implement the living shoreline.

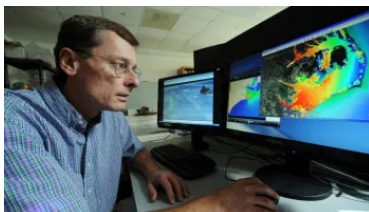
“Our ultimate goal is that living shorelines are the norm,” she said.

“They are more resilient and a better alternative to concrete sea walls and bulwarks. A project of this scale will be visible and increase the awareness of living shorelines. We are hoping there’s a domino effect and homeowners and property managers will want to do the same.”

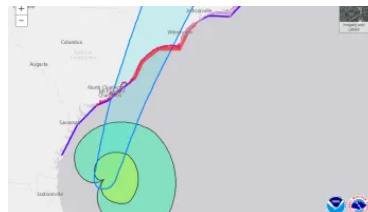
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