2020 Virginia Oyster Restoration Update

Progress toward the Chesapeake Bay Watershed Agreement's 'Ten Tributaries by 2025' oyster outcome

January 2021

Numbers in this document are rounded.

Background

The 2014 Chesapeake Bay Watershed Agreement, which guides the work of the Chesapeake Bay Program, calls for state and federal partners to "restore native oyster habitat and populations in ten Bay tributaries by 2025, and ensure their protection" (hereafter, "Ten Tributaries outcome"). Five tributaries are being restored in Maryland, and five in Virginia. The Chesapeake Bay Program produces an annual overview of Bay-wide progress toward the Ten Tributaries initiative on their Chesapeake Progress website.

In Virginia, the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team convened oyster restoration workgroups—the Hampton Roads Oyster Restoration Workgroup (for the Lafayette and Lynnhaven rivers) and the Western Shore Oyster Restoration Workgroup (for the Piankatank, lower York, and Great Wicomico rivers). These workgroups include representatives from federal and state agencies, municipalities, academic institutions, and nongovernmental organizations. Workgroups plan, coordinate, implement, and monitor large-scale oyster restoration in each tributary. Each is working to set tributary-specific restoration goals and develop plans ("Restoration Blueprints") describing how the tributaries will be restored, consistent with success criteria described in the Chesapeake Bay Oyster Metrics Report ("Oyster Metrics").

Virginia Progress Summary

Despite delays due to COVID-19 restrictions, partners were able to construct more than 74 acres of reefs in Virginia in 2020 toward the Ten Tributaries outcome. Since 2014, partners have constructed more than 294 acres at a cost of $6.44 million*. Prior to the large-scale restoration Initiative, there were already 463 acres of existing oyster reefs that met the Oyster Metrics success criteria. These are a combination of earlier restoration projects and reefs that have self-restored. To date, one Virginia tributary, Lafayette River, has been restored toward the Ten Tributaries outcome. However, Virginia has gone above and beyond by restoring an additional tributary (see section below on Elizabeth River's Eastern Branch). Goals have been set and Restoration Blueprints developed for all five tributaries, including the Great Wicomico River in 2020.

In late 2020, Virginia announced $10 million in new funding from its state budget to support future oyster restoration in the Chesapeake Bay. This marks the first time that capital funds, which are typically reserved for infrastructure projects, have been explicitly designated to restore Virginia's natural resources.

With input from Virginia partners, the National Oceanic and Atmospheric Administration (NOAA) builds and maintains GIS geodatabases of relevant spatial information for each tributary to help plan and track collective oyster restoration efforts under the Ten Tributaries outcome. Many reefs that existed prior to this effort are monitored as part of the annual Virginia Oyster Stock Assessment (VOSARA), conducted jointly by the Virginia Marine Resources Commission (VMRC) and the Virginia Institute of Marine Science (VIMS). Newly constructed reefs will be added to the VOSARA survey when and where it is feasible. The U.S. Army Corps of Engineers (USACE)-Norfolk District, in partnership with VIMS and Christopher Newport University (CNU), also monitors reefs they have constructed.

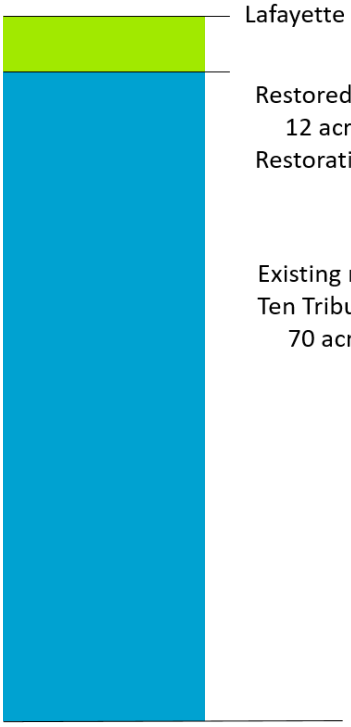
Lafayette River

Progress

Planned oyster restoration work on the Lafayette River was completed in 2018, making it the first river in Virginia to be considered complete under the Ten Tributaries outcome. Going above and beyond the planned restoration work, the Elizabeth River Project in 2020 partnered with the U.S. Navy's Lafayette River Annex to install 405 oyster castles along 90 linear feet of shoreline at the facility. The reef was then seeded with six cages of oyster spat-on-shell—oysters that the annex grew the previous year for the project.

Outlook

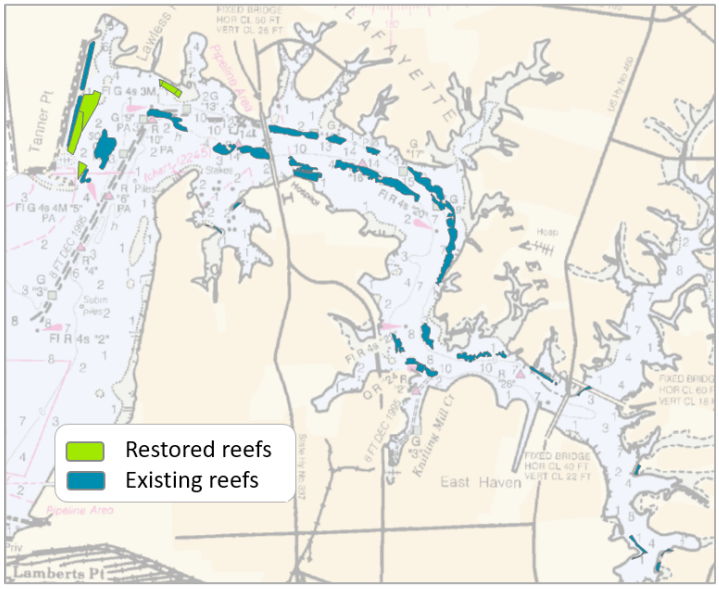
Completion of the planned restoration work has launched the Hampton Roads Workgroup into the monitoring phase of the project. Oyster reef sampling on earlier restoration projects and relict reefs shows high densities of oysters representing numerous year classes, boding well for the newer Lafayette reefs. In 2021, with funding from VIMS, partners plan to monitor the restored reefs relative to the Oyster Metrics success criteria.



Lafayette River Restoration Goal: 80 acres

Restored under Ten Tributaries Initiative:
12 acres *(completed in 2018)*
Restoration cost*: $716,000

Existing reefs prior to the Ten Tributaries Initiative:
70 acres



Lynnhaven River

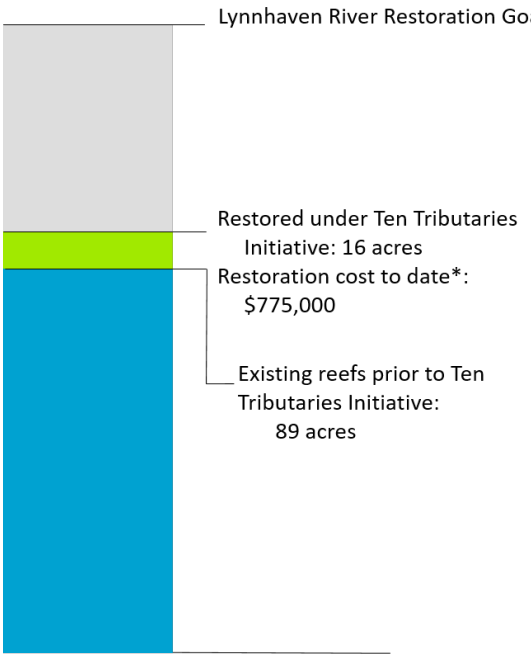
Progress

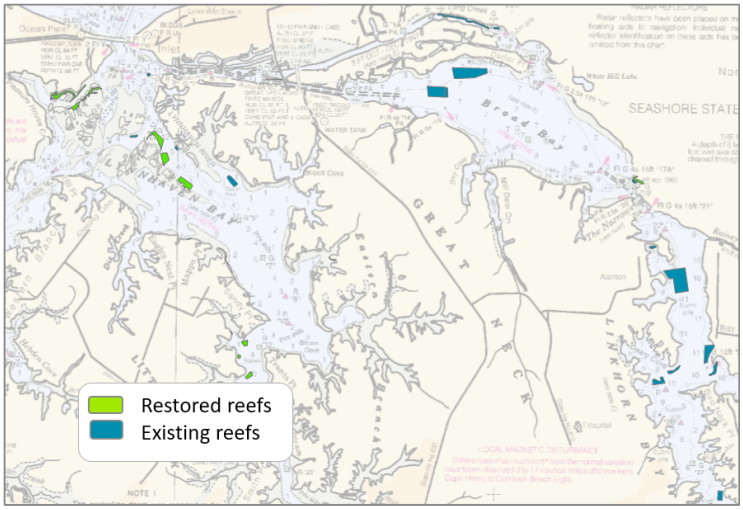
The Lynnhaven River Restoration Blueprint sets a goal of 152 acres of reefs in the river. In 2020, USACE, the City of Virginia Beach, and the Chesapeake Bay Foundation (CBF) partnered to install 136 reef balls around the perimeter of an SAV restoration project. Lynnhaven River Now (LRNOW) also installed 860 oyster castle blocks in Long Creek to replace an equivalent amount of oyster castles that had been accidentally destroyed as part of a dredging operation.

USACE, in partnership with VIMS and CNU, released survey results indicating that the vast majority of restored reefs in the river are meeting or exceeding success criteria for oyster biomass and density.

Outlook

In 2021, USACE plans to construct eight acres of reef using prefabricated concrete structures as the first phase of its Lynnhaven River Basin Ecosystem Restoration project. The City of Virginia Beach is the nonfederal sponsor for this project and owns the leases where the reefs will be built. In total, USACE and the City of Virginia Beach have committed to restoring 31 acres in the Lynnhaven River. In 2021, CBF and LRNOW also plan to construct an additional 10 to 12 acres of reefs (10 to 11 acres of crushed concrete and 1 acre of shell reef) with funding from the National Fish and Wildlife Foundation (NFWF) and NOAA. CBF and LRNOW have received additional funding from NFWF to construct additional reef acreage in 2022. The combined federal funding and NFWF grant funding should be sufficient to complete the oyster restoration acreage goal for the Lynnhaven.





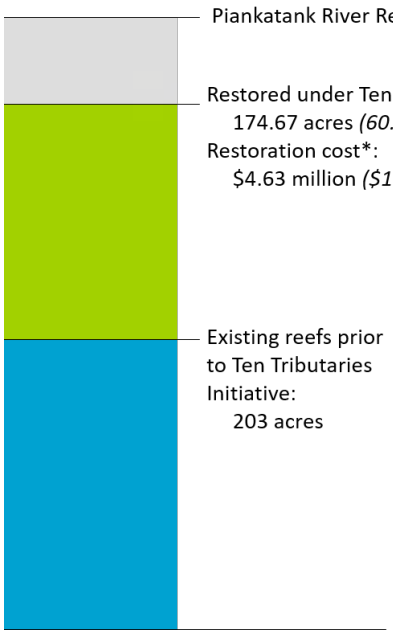
Piankatank River

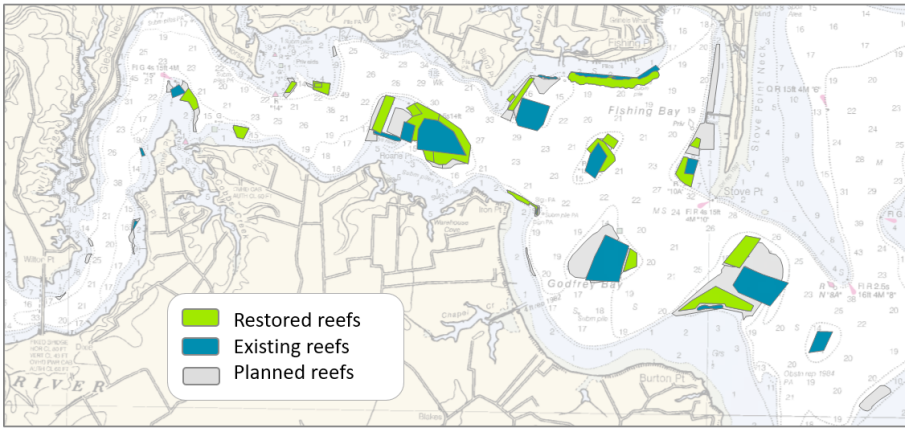
Progress

The Piankatank River Restoration Blueprint sets a goal of 438 acres of reefs in the River. In 2020, VMRC constructed 60.19 acres of reefs using crushed stone material 2"-4" in diameter. These reefs were constructed using $540,000 of NOAA funds, $533,214 of VMRC funds, and $35,000 of funds from The Nature Conservancy. In addition, Virginia Commonwealth University (VCU) planted 7.5 million spat-on-shell into the river, using material collected through its shell recycling program. USACE, in partnership with VIMS and CNU, conducted monitoring work on USACE-built reefs in the river in 2020. The results will be available in early 2021, but initial results show that these reefs typically surpass the Oyster Metrics density and biomass success criteria.

Outlook

In 2021, VMRC (with NOAA and VMRC funding) plans to construct a minimum of 33 acres of reefs in the river using stone material. Pending funding, NOAA intends to award additional reef construction funds to VMRC in 2022 as well. USACE plans to construct up to 156 acres in the river, pending funding. The Virginia Oyster Shell Recovery Program at Virginia Commonwealth University (VCU) was awarded funding from NOAA to work with the localities, restoration partners, and seafood industry to develop and deliver a comprehensive communication strategy for the communities of Gloucester, Mathews, and lower Middlesex counties surrounding the lower Piankatank River. In 2021, VCU and Green Fin Communications will convey information on the oyster restoration efforts for the lower river as it relates to the larger goals under the Chesapeake Bay Watershed Agreement with the intent to garner increased participation and support.





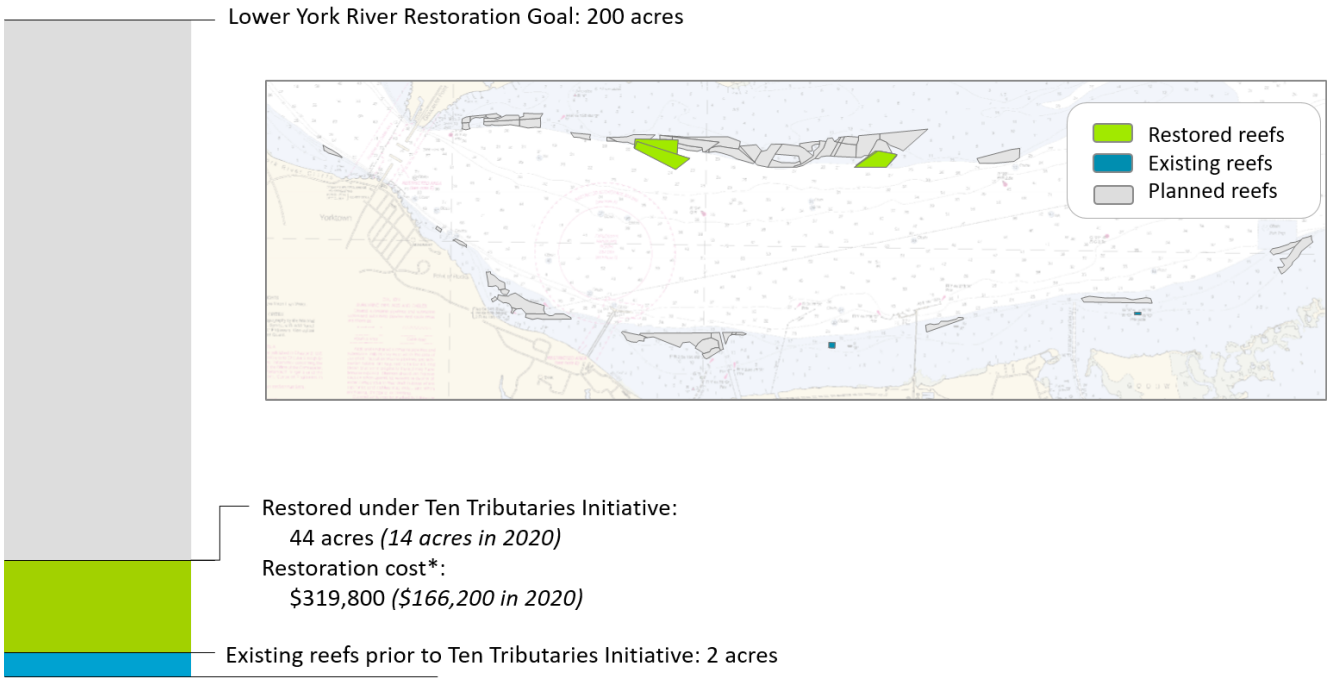
Lower York River

Progress

The Lower York River Restoration Blueprint sets a goal of 200 acres of reefs in the river. In 2020, VMRC constructed 13.2 acres of reefs in the river using shell. VMRC monitored the reefs constructed in 2019 and 2020 as part of its VOSARA survey. Initial recruitment has been strong.

Outlook

VMRC intends to continue reef construction in the lower York River in 2020.



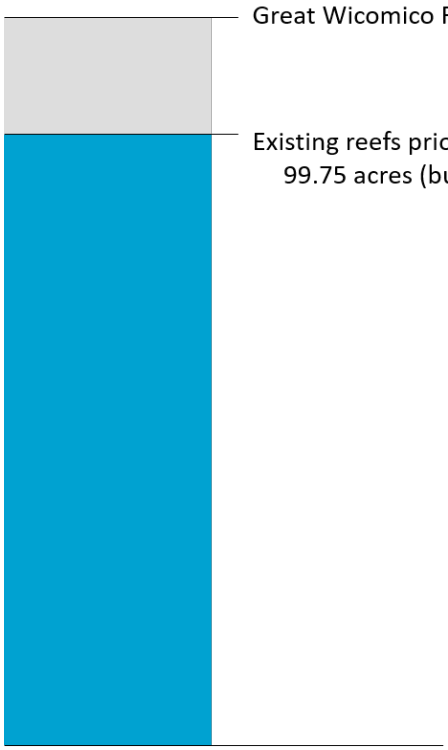
Great Wicomico River

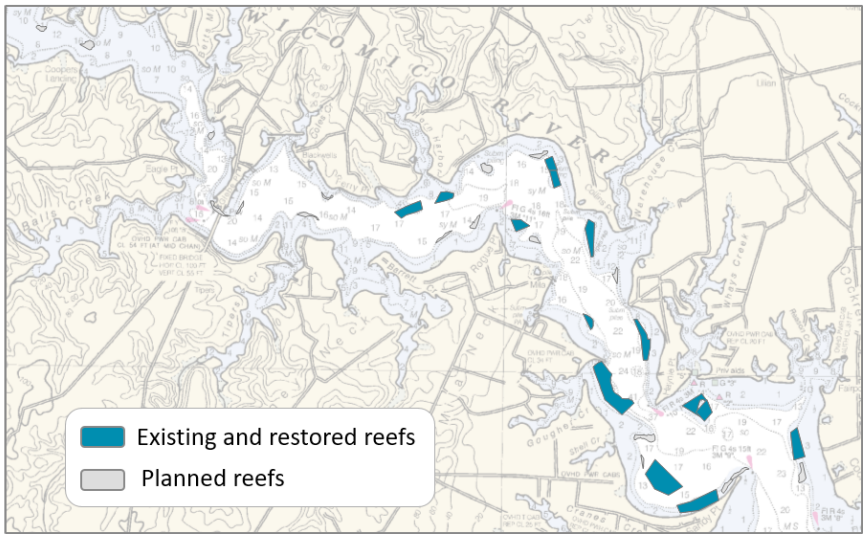
Progress

The Great Wicomico River Restoration Blueprint sets a goal of 122.25 acres of reefs in the river. Past work by the USACE-Norfolk District and VMRC has resulted in nearly 100 acres of oyster reefs in the Great Wicomico River that already meet the oyster density and biomass criteria to be considered successful per Oyster Metrics. This existing work means the river is already well on its way toward meeting the goal of 122.25 acres of reefs

Outlook

Partners intend to work collaboratively to restore the remaining 22.5 acres identified for restoration in the Restoration Blueprint by 2025.





Elizabeth River's Eastern Branch

Virginia has gone above and beyond the five tributaries by completing oyster restoration work in the Eastern Branch of the Elizabeth River In 2020. Using $1.5 million in funding from the Atlantic Wood Industries Superfund settlement, VMRC completed the construction of 21 acres of reef. The reefs were constructed in three locations using approximately 100,000 bushels of shell hash (fine oyster shell) as a base topped with 10,000 tons of crushed stone 2"-4" in diameter. The reefs were built to be volumetrically 6" in height, although some variation in actual height across the reefs is anticipated, with no areas expected to exceed 12" in height. Previously, the Elizabeth River Project and other partners had restored 2.7 acres of reef. As a result of the construction of 23.7 acres of oyster reef habitat, the Elizabeth River's Eastern Branch oyster population is now considered fully restored. This summer's reef construction work also completed a habitat goal established in 2014 by more than 100 community partners in the Eastern Branch Environmental Restoration Strategy. Monitoring will take place at three and six years after construction to assess whether the restored reefs meet the success criteria established in the Oyster Metrics. Restoration partners also have funding in place to construct an additional 2.7 acres of reefs in the near future.

Factors Influencing Performance

Many factors may influence the successful completion of the Ten Tributaries outcome. These include restoration funding, poaching, water quality, oyster disease, acquisition of real estate rights, fluctuations in natural oyster recruitment, and availability of suitable reef-building substrate. That oyster restoration can succeed in the Virginia waters of the Chesapeake Bay has been validated by past successful oyster restoration efforts in the Lafayette, Piankatank, Great Wicomico, and Lynnhaven rivers and by the discovery of a relict, self-sustaining oyster population in the Lafayette River. These serve as evidence that oyster populations can prosper in the Chesapeake Bay, either naturally or due to restoration in sanctuaries. Virginia experiences relatively high natural oyster recruitment rates, which minimizes the need for augmentation with hatchery-produced oysters. Recent declining trends in disease mortality rates may increase on-reef survival and sustainability of restoration efforts.

*Reef construction only. Associated costs such as benthic surveys, oyster population surveys, planning, permitting, and monitoring are not reflected. Restoration cost per acre varies due to factors including material type, reef configuration, hydrologic factors, agency and stakeholder preferences, and other factors.

The 2020 Virginia Oyster Restoration Update was compiled by the Hampton Roads and Western Shore Restoration Workgroups of the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team:

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- U.S. Army Corps of Engineers' Norfolk District (USACE), cochair
- Chesapeake Bay Foundation (CBF)
- Christopher Newport University (CNU)
- City of Norfolk
- City of Virginia Beach
- Elizabeth River Project
- Lynnhaven River NOW
- The Nature Conservancy (TNC)
- Pleasure House Oysters/Ludford Brothers Oyster Company
- Virginia Commonwealth University (VCU)
- Virginia Institute of Marine Science (VIMS)
- Virginia Marine Resources Commission (VMRC)

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