

# 2019 Virginia Oyster Restoration Update

## Progress toward the '10 tributaries by 2025' outcome in the Chesapeake Bay Watershed Agreement

February 2020

### Background

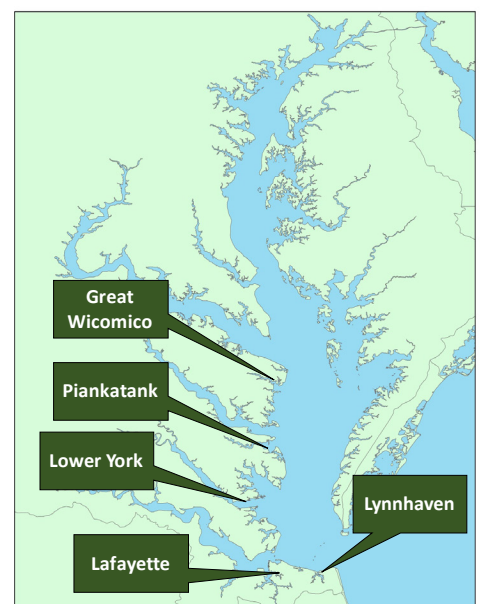
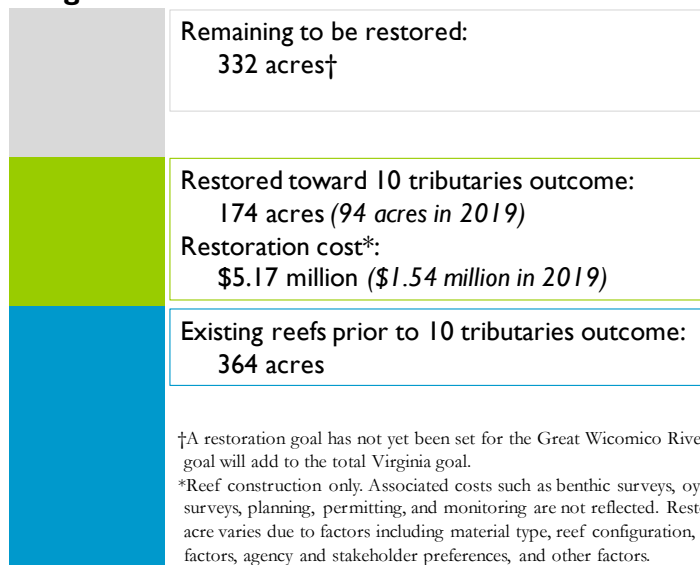
The 2014 Chesapeake Bay Watershed Agreement, which guides the work of the Chesapeake Bay Program, calls for state and federal partners to “restore native oyster habitat and populations in 10 Bay tributaries by 2025, and ensure their protection” (hereafter, ‘10 tributaries outcome’). Five tributaries are being restored in Virginia, and five in Maryland. An overview of Bay-wide progress toward the 10 tributaries outcome is available at <https://www.chesapeake-progress.com/abundant-life/oysters>.

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,’ see [https://www.chesapeakebay.net/channel\\_files/17932/oyster\\_restoration\\_success\\_metrics\\_final.pdf](https://www.chesapeakebay.net/channel_files/17932/oyster_restoration_success_metrics_final.pdf)).

### Virginia Progress Summary

In 2019, restoration partners constructed 94 acres of oyster reefs in Virginia under the 10 tributaries outcome at a cost of \$1.54 million\*. Since 2014, partners have constructed 174 acres under the 10 tributaries outcome at a cost of \$5.17 million\*. Prior to large-scale restoration toward the outcome, 473 acres of existing oyster reefs already 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, the Lafayette River, has been restored. Acreage goals have been set and restoration blueprints developed for four tributaries (including the Lafayette River). The fifth restoration blueprint (Great Wicomico River) is expected in 2020. Many reefs that existed prior to the 10 tributaries outcome are monitored as part of the annual Virginia Oyster Stock Assessment (VOSARA), which is conducted jointly by the Virginia Marine Resources Commission and Virginia Institute of Marine Science. Newly constructed reefs will be added to the VOSARA survey when and where it is feasible. Graphic summaries of the status of the oyster stocks monitored under VOSARA are available at <http://cmapp2.vims.edu/VOSARA/viewer/VOSARA.html>.

#### Virginia Restoration Goal: 870 acres in 4 tributaries†



## Progress

Oyster restoration work on the Lafayette River toward the 10 tributaries outcome was finished in 2018, making it the first river in Virginia to be considered complete under the 10 tributaries outcome. The Lafayette River Restoration Blueprint (available at [https://www.chesapeakebay.net/who/group/maryland\\_and\\_virginia\\_oyster\\_restoration\\_interagency\\_teams](https://www.chesapeakebay.net/who/group/maryland_and_virginia_oyster_restoration_interagency_teams)) called for restoring 80 acres of reefs. Of these, 70 acres already met the criteria to be considered restored reefs. These reefs were either restored in years past or naturally in good shape. This left 10 acres for the partners to restore per the restoration blueprint. The Elizabeth River Project and the Chesapeake Bay Foundation constructed approximately 12 acres of reefs in 2017 and 2018, thereby slightly exceeding the restoration goal for the river.

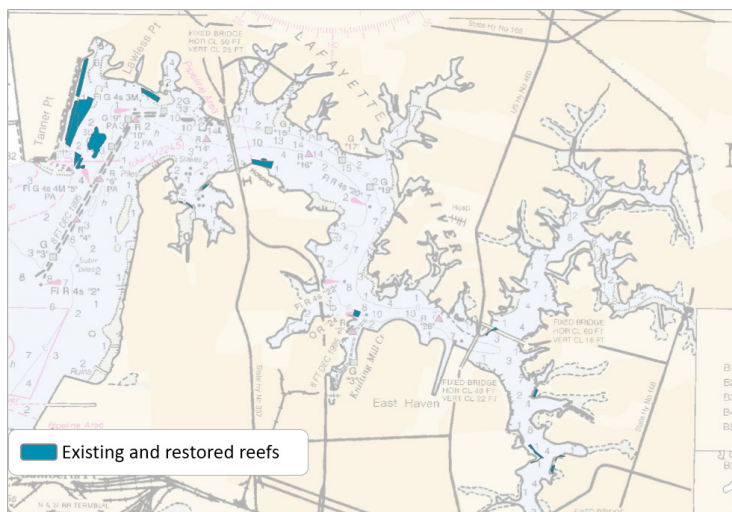
## Outlook

Oyster restoration work toward the 10 tributaries outcome in the river is complete. Oyster reef sampling on earlier restoration projects and relict reefs shows high densities of oysters representing numerous year classes. This bodes well for newer Lafayette reefs. Partners plan to monitor the restored reefs relative to the Oyster Metrics success criteria.

## Lafayette River Restoration Goal: 80 acres

Restored toward 10 tributaries outcome:  
12 acres (*completed in 2018*)  
Restoration cost\*: \$716,000

Existing reefs prior to the 10 tributaries outcome:  
70 acres



\*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, factors, agency and stakeholder preferences, and other factors.

## Progress

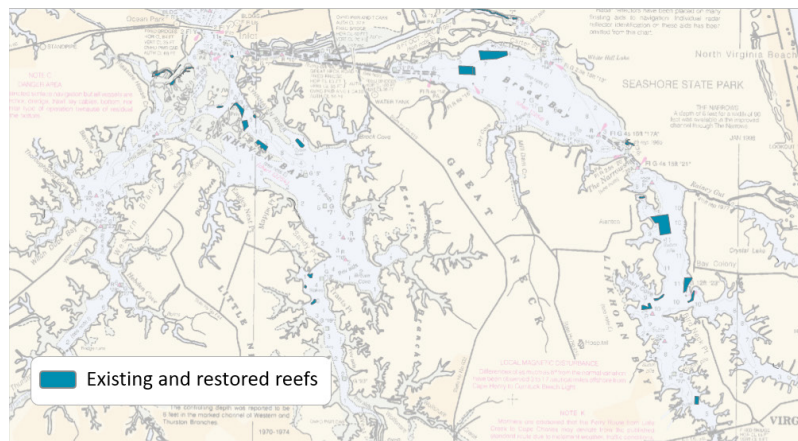
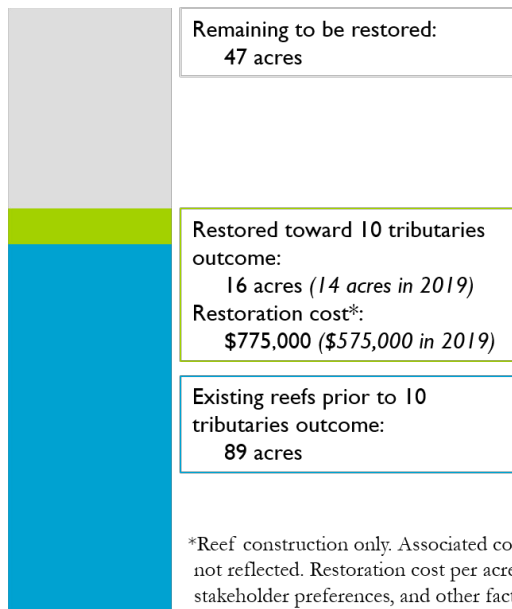
The Lynnhaven River Restoration Blueprint (available at [https://www.chesapeakebay.net/who/group/maryland\\_and\\_virginia\\_oyster\\_restoration\\_interagency\\_teams](https://www.chesapeakebay.net/who/group/maryland_and_virginia_oyster_restoration_interagency_teams)) set a goal of 152 acres of reefs in the river. Prior to the 10 tributaries outcome, 89 acres of reefs were functioning at a restored level in the river, leaving 63 to be restored. These include naturally occurring intertidal reefs and reefs constructed by the U.S. Army Corps of Engineers (USACE), Lynnhaven River Now, and Virginia Marine Resources Commission (VMRC).

In 2019, VMRC, using NOAA funding, constructed 14 acres of reef in the Broad Bay and Humes Marsh areas of the Lynnhaven River from dredged shell and crushed stone. When combined with the 2 acres constructed by Lynnhaven River Now in 2017, this leaves 47 acres to be restored. USACE, in partnership with VIMS and Christopher Newport University, conducted a survey of constructed subtidal reefs in the river in 2019. The results will be available in early 2020.

## Outlook

In 2020, USACE plans to construct up to 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. The Chesapeake Bay Foundation and Lynnhaven River Now plan to construct an additional 11 to 13 acres of reefs (10 to 12 acres of crushed concrete and 1 acre of shell reef) with grant funds received in 2018 and 2019 from the National Fish and Wildlife Foundation. This will bring the tributary within 5 acres of completion. Beginning in 2020, partners will use the Chesapeake Bay Foundation's new mobile oyster production facility to help stock reefs in the Lynnhaven and other target tributaries in Virginia.

## Lynnhaven River Restoration Goal: 152 acres



## Progress

The Piankatank River Restoration Blueprint (available at [https://www.chesapeakebay.net/who/group/maryland\\_and\\_virginia\\_oyster\\_restoration\\_interagency\\_teams](https://www.chesapeakebay.net/who/group/maryland_and_virginia_oyster_restoration_interagency_teams)) set a goal of 438 acres of reefs in the river.

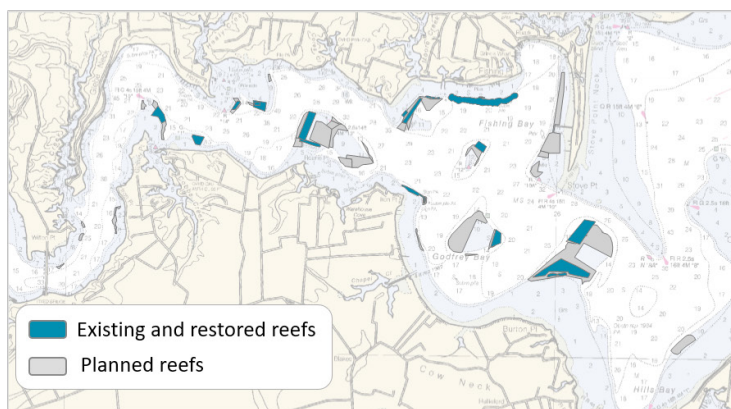
In 2019, the Virginia Marine Resources Commission (VMRC) constructed 46 acres of reefs using stone material approximately two inches in diameter. In addition, Virginia Commonwealth University (VCU) constructed more than 1 acre of reef using spat-on-shell through its shell recycling program, planting nearly 20 million oysters into the river.

The U.S. Army Corps of Engineers (USACE), in partnership with the Virginia Institute of Marine Science and Christopher Newport University, conducted monitoring work on USACE-built reefs in the river in 2019. The results will be available in early 2020, but initial results show that these reefs generally meet the Oyster Metrics density and biomass success criteria.

## Outlook

In 2020, VMRC (with NOAA and VMRC funding) plans to construct at least 33 acres of reefs in the river using stone material. Pending availability of funding, NOAA intends to award additional reef construction funds to VMRC in 2021 and 2022. Through these awards, NOAA and partners intend to explore the relative advantages of constructing reefs at various heights in the river. USACE plans to construct up to 156 acres in the river, pending funding.

### Piankatank River Restoration Goal: 438 acres



\*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.

### Progress

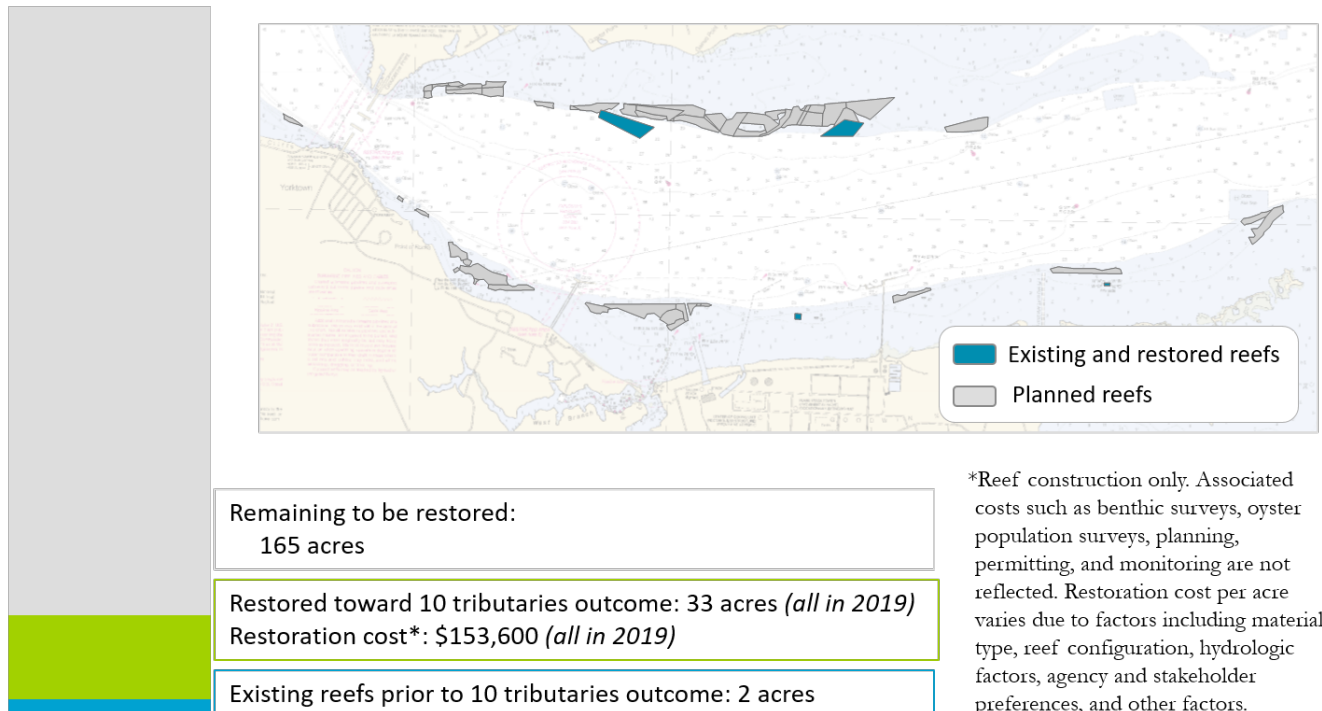
In 2019, the Western Shore Workgroup completed a restoration blueprint for the lower York River (available at [https://www.chesapeakebay.net/who/group/maryland\\_and\\_virginia\\_oyster\\_restoration\\_interagency\\_teams](https://www.chesapeakebay.net/who/group/maryland_and_virginia_oyster_restoration_interagency_teams)). This plan sets a goal of 200 acres of reef in the river. Unique to this river is the presence of multiple historic shipwrecks; the workgroup worked with Virginia historic resources agencies to avoid planning to construct reefs on these sites.

In 2019, the Virginia Marine Resources Commission constructed 33 acres of reefs in the river using fossil shell material. The U.S. Army Corps of Engineers, in partnership with the Virginia Institute of Marine Science, conducted monitoring work in the river in 2019; results will be available in early 2020.

### Outlook

Pending availability of funding, the Virginia Marine Resources Commission intends to continue reef construction in the lower York River in 2020.

## Lower York River Restoration Goal: 200 acres





## Great Wicomico River

The Great Wicomico River has been approved by the Sustainable Fisheries Goal Implementation Team of the Chesapeake Bay Program as the fifth Virginia tributary under the 10 tributaries outcome. The Western Shore Workgroup developed a GIS geodatabase of Great Wicomico River spatial information relevant to oyster restoration. The geodatabase, maintained by NOAA, will be used to help the Western Shore Workgroup set restoration goals and track progress. In 2019, NOAA completed prerestoration habitat characterization of the river bottom. This will guide the development of a Great Wicomico River Restoration Blueprint, expected to be complete in 2020.

The U.S. Army Corps of Engineers, in partnership with the Virginia Institute of Marine Science, conducted monitoring work in the river in 2019; results will be available in early 2020 and will inform restoration planning. In 2003 and 2004, the U.S. Army Corps of Engineers and Virginia Marine Resources Commission constructed 85 acres of reefs in the river using shell material. Reef rehabilitation and adaptive management have occurred over time. Most of these reefs currently meet the Oyster Metrics density and biomass success criteria.

## Factors Influencing Success

Many factors will influence the successful completion of the 10 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.

Oyster restoration can succeed in the Virginia waters of the Chesapeake Bay; this 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, whether 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 declines in disease mortality rates may increase on-reef survival and sustainability of restoration efforts.

The 2019 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:

- National Oceanic and Atmospheric Administration (NOAA), cochair
- 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
- Department of Defense/Navy Chesapeake Bay Program
- Elizabeth River Project
- Lynnhaven River NOW
- The Nature Conservancy (TNC)
- The Pew Charitable Trusts
- 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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