

USACE Oyster Restoration Update

VIRGINIA:

Since restoration activities began in Virginia, we have constructed approximately 154 acres of permanent oyster sanctuaries as well as 247 acres of public oyster fishery in Virginia waters in the Rappahannock, Tangier-Pocomoke, Great Wicomico and Lynnhaven Rivers. Norfolk District, in partnership with VMRC, intends to rehabilitate 18 acres of reef in the Great Wicomico this summer. In addition, in partnership with TNC and VMRC, we intend to construct approximately 20 acres this summer and 20 acres next summer of permanent sanctuary reef in the Piankatank River. Tributary planning activities have begun for the Lafayette and Piankatank Rivers. Additionally, a team has convened to discuss the long-term restoration status of the Lynnhaven River.

MARYLAND:

Since restoration activities began in Maryland, we have constructed approximately 538 acres of new Maryland oyster bars in the Magothy, Severn, Choptank, Patuxent, and Chester Rivers, as well as Kedges Strait and Eastern Bay. This includes 23.3 acres of oyster reef construction in Harris Creek that was constructed this fiscal year and completed in April. The FY 2014 Maryland contract is planned for award this summer. For this contract, shell and/or granite will be placed as substrate in 62 acres in Harris Creek and 24 acres in Tred Avon, tributaries to the Choptank River. The work will be accomplished from December 2014 through March 2015. The additional acreage in Harris Creek will nearly complete restoration activities in that Tributary. Monitoring activities will continue.

2013 Implementation Update

Oyster Restoration Progress in the Choptank Complex: Harris Creek, Little Choptank River, and Tred Avon River

February 2014

This document describes progress made in implementing the Harris Creek Oyster Restoration Tributary Plan (available at www.chesapeakebay.noaa.gov/images/stories/habitats/harriscreekblueprint1.13.pdf) and large-scale oyster restoration in the Little Choptank and Tred Avon Rivers. In 2013, significant accomplishments were made in planting both seed and substrate in Harris Creek, and monitoring efforts tracked construction and water quality and showed impressive survival rates for oysters planted in 2012 and 2013. In the Little Choptank and Tred Avon Rivers, draft tributary plans were developed that provide an initial roadmap for construction and planting in the coming years.

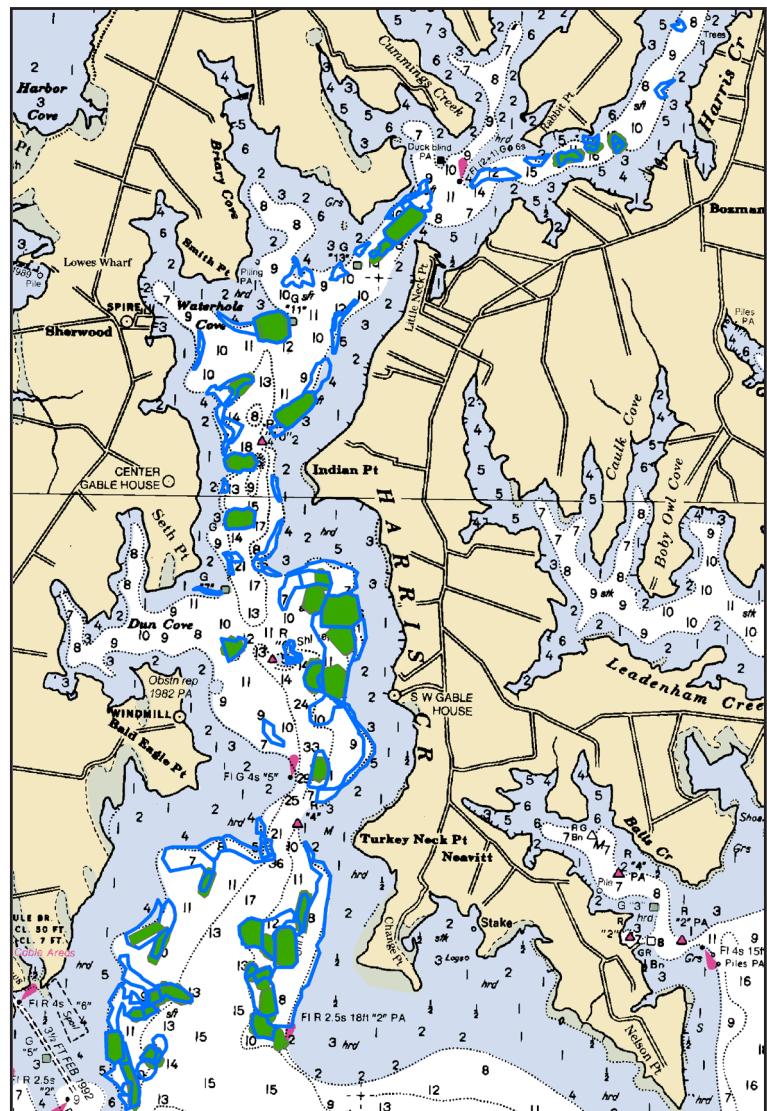
Harris Creek

2013 Implementation Progress

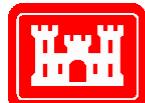
2013 Reef Construction and Seeding

The Harris Creek Oyster Restoration Tributary Plan targets 377 acres for restoration work. Since 2011, restoration action has occurred on 188.6 acres of oyster reef habitat.

- In 2013, a total of 67.6 acres of reefs were constructed and/or planted with oyster seed in Harris Creek.
- The Oyster Recovery Partnership (ORP), with funding from NOAA and the Maryland Department of Natural Resources (MD DNR), planted a total of 711.6 million seed oysters in Harris Creek in 2013. These oysters were produced by the University of Maryland.
- The U.S. Army Corps of Engineers, Baltimore District (USACE) constructed 34 acres of oyster reefs, using a mixture of shell and granite substrate. All 34 acres were then planted with oyster seed.
- ORP planted an additional 29 acres with seed only (no reef-building substrate was required on these sites).
- The Chesapeake Bay Foundation, with funding from NOAA and help from citizen volunteers, planted 11.5 million seed oysters onto a 4.6 acre site.



Restoration Progress in Harris Creek. Areas in green indicate where restoration has occurred; blue outlines show target restoration areas.



US Army Corps
of Engineers®



MARYLAND
DEPARTMENT OF
NATURAL RESOURCES



OYSTER RECOVERY
PARTNERSHIP | ORP

Summary of Restoration Progress in Harris Creek, 2011-13

Acres Targeted in Harris Creek Tributary Plan	377
Acres Planted with Substrate and Seed in 2013	34
Acres Planted with Seed Only in 2013	33.6
Total Acres Constructed/Planted in 2013	67.6*
Acres Constructed/Planted since Start of Project in 2011	188.6*

*Additional seeding may be required on some areas to maintain target oyster densities, depending on seed survival rates.

Estimated Oyster Seed Required to Complete Harris Creek Tributary Plan	2 billion
Seed Planted in 2013	0.7 billion
Seed Planted since Start of Project in 2011	1.2 billion

2013 Monitoring

- ORP and MD DNR, in partnership with Dr. Ken Paynter of the University of Maryland, monitored all spat planted in Harris Creek in 2012 and 2013. Initial survival of oysters planted in 2012 and 2013 averaged 37% and 35% respectively. This is more than twice the 15% survival projected in the Harris Creek Tributary plan. This exceptional survival is likely due largely to the use of side-scan sonar data and diver groundtruthing of bars prior to planting, ensuring oyster seed went on the best available bottom habitat.
- NOAA completed detailed preconstruction sonar surveys for all sites targeted for substrate placement in 2013. Post-construction surveys will occur in early 2014, and again in 2015 and 2018, to assess as-built conditions to determine whether the reefs are persisting in terms of height and spatial extent.
- In July 2012, MD DNR installed a vertical profiler in Harris Creek (middle of the sanctuary, south of Indian Point) to obtain continuous water-quality data throughout the water column (see mddnr.chesapeakebay.net/eyesonthebay/profiler.cfm). In September 2013, MD DNR also installed water-quality monitors upstream and downstream of the vertical profiler to better characterize the range of conditions over the Harris Creek restoration area. Water conditions were favorable for oysters throughout 2013.
- Recent monitoring on Harris Creek has shown variable levels of the oyster disease *Perkinsus marinus* (commonly called Dermo). On some reefs planted in 2012, nearly 100% of the oysters have some degree of Dermo. The intensity of this disease is measured on a scale from 0 to 5, where 5 is the most intense; 3 and below is considered sublethal. Most of the oysters showed a Dermo infection intensity of 1 or 2. Some natural populations sampled alongside hatchery oysters showed similar infection levels. But samples taken from a reef near Tilghman Wharf showed low Dermo levels, as they have for the past five years, illustrating that disease levels are highly variable. High mortality has not been observed on the reefs with either high or low disease levels. Because disease virulence increases with salinity, a dry year may result in considerable oyster mortality.

Cost

In 2013, partners spent \$6.5 million** on reef construction and seeding. (\$1.1 million from NOAA, comprising a \$50,000 award to Chesapeake Bay Foundation and \$1.08 million award to MD DNR that went to ORP; \$3.5 million from MD DNR; and \$1.8 million from USACE). Combined with the \$3.7 million expended by these agencies in 2012, this brings total expenditures so far to \$10.2 million**. Although more acres were constructed in 2012, more money was spent in 2013. This is because more than half of the reefs constructed in 2013 required substrate in addition to seed oysters, while the vast majority of the reefs constructed in 2012 required only seed. (Reefs requiring only seed, and no substrate, are substantially less expensive to construct than reefs requiring substrate. The less-expensive, seed-only reefs were constructed first. The remaining reefs require substrate, so cost per acre will increase in out years.)

The Harris Creek Oyster Restoration Tributary Plan originally estimated a total project cost of about \$31 million** to restore 377 acres. Based on current trends, the project will likely come in under budget. MD DNR is constructing 45.7 acres of reefs in Harris Creek at a height of 6 inches, rather than the initially planned 12-inch height, thereby saving funds in reef construction. The 2012 natural spat set on Harris Creek, together with exceptionally high planted spat survival in 2012 and 2013 may mean some reefs will require fewer hatchery-produced seed oysters than originally planned.

*** These costs represent only funds expended on reef construction and seeding. Costs associated with focusing existing resources into Harris Creek (such as benthic surveys, oyster population and disease surveys, or water quality monitoring) are not reflected; nor are staff salaries. Similarly, the \$31 million project cost described in the Harris Creek Tributary Plan was for reef construction and seeding only, plus a small amount for monitoring required in excess of ongoing monitoring programs.*

2014 Implementation Outlook

- ORP, with funding from NOAA and MD DNR, is slated to produce and plant up to 500 million spat-on-shell into Harris Creek in 2014. This will include planting seed on the reefs USACE and DNR will construct in 2014, and on any additional sites requiring seed.
- MD DNR began construction on 62 acres of new reefs in Harris Creek in December 2013. These reefs will be built using a combination of fossil shell imported from Florida and granite. Rail transport of the shell was subsidized by CSX, working in partnership with the National Fish and Wildlife Foundation. Construction will likely be complete by fall 2014.
- USACE has contracted with Argo Systems to construct 23 acres of reefs in Harris Creek in 2014. These will be constructed from granite and shell, similar to the 2012 and 2013 reefs. Placement started in December 2013, and is expected to be complete by the end of March 2014.
- Post-construction, NOAA will use sonar to survey all newly constructed reefs to ensure material is placed to specification and to collect initial data on reef structure.
- USACE also has funding to construct an additional 29 acres of new reefs in Harris Creek in 2015.

Little Choptank River Oyster Sanctuary

2013 Implementation Progress

The Little Choptank River is the second tributary slated for intensive oyster restoration. The workgroup, in consultation with restoration partners and consulting scientists, created a draft tributary plan for this river in 2013. The draft plan targets 400 acres for oyster restoration, requiring 1.76 billion seed oysters and 360,000 cubic yards of reef-building substrate. Estimated cost for completion is \$28 million.

2014 Implementation Outlook

In 2014, MD DNR plans to construct 33 acres of new oyster reef in the Little Choptank oyster sanctuary. These reefs will be built from a combination of fossil shell imported from Florida and granite. Rail transport of the shell was subsidized by CSX, working in partnership with the National Fish and Wildlife Foundation. Construction will likely occur in the fall of 2014.



Data gathered using sonar helps scientists determine where planting oysters will be most effective.

Tred Avon River Oyster Sanctuary

2013 Implementation Progress

The Tred Avon River is the third tributary selected for large-scale oyster restoration. The workgroup, in consultation with restoration partners and consulting scientists, created a draft tributary plan for this river. The workgroup hosted an open house in November 2013 to hear public input on the plan. The draft plan targets 193 acres for oyster restoration, requiring 772 million seed oysters and 194,000 cubic yards for reef-building substrate. Estimated cost for completion is \$14.5 million.

2014 Implementation Outlook

USACE is planning to build 25 acres of shell and granite reefs here starting in December 2014.

Policy Background

In May 2009, President Obama issued Executive Order 13508, "Chesapeake Bay Protection and Restoration." The oyster outcome associated with this Executive Order is the restoration of oyster populations in 20 Chesapeake Bay tributaries by 2025. In 2009, Maryland rolled out its new oyster strategy, establishing new oyster sanctuaries and calling for restoration of oyster populations. In 2012, the U.S. Army Corps of Engineers unveiled their native oyster restoration plan for Chesapeake Bay, establishing guidelines for site selection and restoration. The similarity of the oyster restoration goals of the federal and state agencies led the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team to convene interagency workgroups in Maryland and Virginia to plan restoration work in each state, in consultation with appropriate partners.

The Maryland Oyster Restoration Interagency Workgroup, in consultation with restoration partners, selected Harris Creek as the first target tributary for intensive restoration. In 2012, the workgroup developed a tributary

plan (see www.chesapeakebay.noaa.gov/images/stories/habitats/harris creek blueprint1.13.pdf) that details the efforts necessary to meet the restoration goals specified by the Oyster Metrics Team (see www.chesapeakebay.noaa.gov/images/stories/fisheries/keyFishSpecies/oystermetricsreportfinal.pdf).

The Little Choptank and Tred Avon River oyster sanctuaries were selected by the Maryland Interagency Workgroup as the second and third focal areas for large-scale oyster restoration under the federal and state oyster restoration plans.



Healthy oysters, like these that were planted in Harris Creek in 2012, grow vertically and create habitat for a wide range of Chesapeake Bay species, including blue crab and a number of finfish.

The 2013 Implementation Update was compiled by the Maryland Oyster Restoration Interagency Workgroup of the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team:

- Stephanie Reynolds Westby, NOAA (chair)
- Steve Allen, Oyster Recovery Partnership
- Kim Gross, U.S. Army Corps of Engineers, Baltimore District
- Angela Sowers, U.S. Army Corps of Engineers, Baltimore District
- Eric Weissberger, Maryland Department of Natural Resources