

Outcome: Oyster Restoration

Goal: Sustainable Fisheries-Protect, restore and enhance finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay.

Outcome: Continually increase finfish and shellfish habitat and water quality benefits from restored oyster populations. Restore native oyster habitat and populations in 10 tributaries by 2025 and ensure their protection.

Draft Date: 3/17/16

Long term Target: Restore oyster populations (complete construction/seeding) in 10 tributaries of the Chesapeake Bay by 2025.

2 year Target: Complete Harris Creek restoration construction, continue construction/seeding in the Little Choptank and Tred Avon. Assess past restoration projects in Lynnhaven and Lafayette against the Oyster Metrics. Develop plans and acreage target for the Piankatank River.

Note: Project cost and funding will not be published on the CBP website.

2016-2017 Workplan

Members of the Maryland and Virginia Interagency Teams are listed below this chart.

Management Approach 1: Restoration planning and implementation.

Key Action** <i>Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.</i>	Performance Target(s) <i>Identify incremental steps to achieve Key Action.</i>	Participating Entity <i>Identify responsible partner for each step.</i>	Geographic Location	Timeline <i>Identify completion date (month & year) for each step</i>	Estimated Project Cost <i>Best estimate of total project cost (needed)</i>	Available funding by Partner	Factors Influencing and/or Gap <i>Identify related factor or gap in Management Strategy</i>
Maryland Interagency Team continues restoration and monitoring in the three currently selected tributaries in Maryland.	Harris Creek: Monitor restored reefs for parameters outlined in the Oyster Metrics. Monitor first cohort in Fall 2015 and the second cohort in Fall 2016 for oyster growth and survival.	MD Interagency Team, University of Maryland	Harris Creek (MD Eastern Shore)	Fall 2016 and Fall 2017	\$130,000 for 2016	NOAA	
	Harris Creek: May need maintenance seeding of restoration sites TBD depending on monitoring results from 2015.	MD Interagency Team	Harris Creek (MD Eastern Shore)	2016	Estimated combined cost for 2016 seeding in Harris Creek, Tred Avon, Little Choptank: \$2,225,000	NOAA (seeding): \$1,000,000 MD DNR (seeding): \$1,225,000	
	MD DNR will continue to collect continuous water quality data at sites in Harris Creek, and monitor the prevalence of Perkinsus marinus (which causes Dermo disease) as part of their annual Fall Survey.	MD DNR	Harris Creek (MD Eastern Shore)	2016-2017	WQ monitoring: \$53,628 per year	MD DNR	
	Tred Avon River: Continue seeding and reef construction. Specific acreage # for seeding and construction is TBD. Plans called for constructing 8 acres of oyster reef habitat in the Tred Avon River in FY16. This construction is delayed pending the State of Maryland's review of oyster management strategies.	MD Interagency Team	Tred Avon River (MD Eastern Shore)	2016-2017	Tred Avon 2016 construction cost: \$1,970,000 Estimated combined cost for 2016 seeding in Harris Creek, Tred Avon, Little Choptank: \$2,225,000	USACE (construction): \$1,970,000 NOAA (seeding): \$1,000,000 MD DNR (seeding): \$1,225,000	# acres seeded will depend hatchery production. Estimate approx. 100 total acres will be seeded between Tred and Little Choptank in 2016.
	Tred Avon River: Conduct a series of meetings and on-water data collection trips with the watermen community and staff/leadership from NOAA, USACE and MD DNR. Finalize the draft tributary plan based on the outcome of these meetings.	MD Interagency Team	Tred Avon River (MD Eastern Shore)	early-mid 2016	Staff time	Staff time from NOAA, USACE and MD DNR	

	Tred Avon River: Gather public input on the shallow water reef construction Environmental Assessment (EA).	USACE	Tred Avon River (MD Eastern Shore)	Spring 2016	Staff time	Staff time from USACE		
	Little Choptank: Continue seeding and reef construction, with specific acreage # TBD based on hatchery production. Reef construction pending reactivation and approval of permit application.	MD Interagency Team	Little Choptank River (MD Eastern Shore)	2016-2017	Estimated combined cost for 2016 seeding in Harris Creek, Tred Avon, Little Choptank: \$2,225,000	NOAA (seeding): \$1,000,000 MD DNR (seeding): \$1,225,000	# acres seeded will depend hatchery production. Estimate approx. 100 total acres will be seeded between Tred and Little Choptank in 2016.	
	Tred Avon and Little Choptank Rivers: Maryland DNR will continue to collect continuous water quality data.	MD DNR	Tred Avon and Little Choptank Rivers (MD Eastern Shore)	2016-2017	WQ monitoring: \$53,628 per tributary per year	MD DNR	Funding for YSI's and salary must be secured.	
	Continue monthly meetings of the MD Interagency Team to discuss progress and future plans in selected tributaries in Maryland.	MD Interagency Team (NOAA lead)	Maryland	Ongoing	Staff time	Staff from NOAA, USACE, MD DNR and ORP		
	Total							
Virginia Interagency Team continues restoration and monitoring in the three currently selected tributaries in Virginia.	Lynnhaven River: Complete restoration planning process and develop a tributary acreage goal. Continue evaluating the status of past restoration projects.	Lynnhaven Team (USACE lead)	Lynnhaven River (VA)	Ongoing	Staff time	Staff from USACE, NOAA, VMRC, VIMS, CBF, Lynnhaven River NOW, City of Virginia Beach, Oyster Reefkeepers		
	Lynnhaven River: Add hard reef habitat as part of the Lynnhaven Ecosystem Restoration Project (FY16 and 17).	USACE	Lynnhaven River (VA)	2016-2017	TBD	USACE	These projects are dependent upon the ability to obtain bottom leases in the project areas.	
	Lafayette River: Complete restoration planning process. Construct 10 acres of reefs to meet tributary target of 80 acres (70 acres have already been restored or meet the Oyster Metrics criteria for restored reefs).	Lafayette Team (NOAA lead)	Lafayette River (VA)	Ongoing	Staff time + approx. \$1.3 million for 10 acres of construction	Gap: \$1.3 million not yet identified. Staff time from USACE, NOAA, VMRC, VIMS, CBF, Christopher Newport University, City of Norfolk, Elizabeth River Partnership		

	Piankatank River: Complete restoration planning process and develop a tributary acreage goal. Develop a baseline evaluation to evaluate existing reef acreage and inform the tributary acreage goal.	Piankatank Team (NOAA lead)	Piankatank River (VA)	2016-2017	Staff time + Funding (amount TBD) to survey existing reefs	Staff time from NOAA, USACE, VMRC, VIMS, TNC, CBF	These projects are dependent upon the ability to obtain bottom leases in the project areas.
	Piankatank River: USACE plans to construct 39-acres of habitat (alternative substrates and possibly larger reef balls).	USACE	Piankatank River (VA)	2016	TBD	USACE	
	Piankatank River: VMRC will continue shell maintenance on past restoration sites.	VMRC	Piankatank River (VA)	2016-2017	approx. \$120,000 per year	VMRC	
	VA Interagency Team will continue to meet quarterly to discuss progress and future plans for restoration in Virginia. Specific tributary teams will continue to meet more frequently as needed.	Virginia Interagency Team (USACE lead)	Virginia	Ongoing	Staff time	Staff time from Lafayette, Lynnhaven and Piankatank Teams and additional stakeholders	
Total							
Select additional tributaries in Maryland and/or Virginia for restoration.	Interagency teams review selection criteria and recommend additional candidate tributaries in Maryland and Virginia for restoration, including collaborating with the Potomac River Fisheries Commission to discuss efforts in the Potomac River.	MD and VA Interagency Teams	MD and VA	late 2016/early 2017	Staff time	Staff time from MD and VA Interagency Teams	
	Jurisdictions identify candidate tributaries to go forward for public scoping.	MD DNR and VMRC	MD and VA	early 2017	Staff time	Staff time from MD DNR and VMRC	
	Maryland: Conduct public scoping to obtain input on tributary selection in Maryland with selection by late 2017.	MD Interagency Team	MD	early 2017	Staff time	Staff from NOAA, USACE, MD DNR and ORP	
Total							
Continue collecting data to quantify ecosystem services on restored reefs.	NOAA Chesapeake Bay Office will continue to administer their grant-funded Oyster Reef Ecosystem Services (ORES) projects. The ORES Principal Investigators will continue to conduct their research to quantify the ecosystem benefits of oyster reef restoration.	NOAA, VIMS, UMD, UMCES, VCU, SERC	<u>Maryland</u> : Harris Creek, Little Choptank River, Tred Avon River; <u>Virginia</u> : Great Wicomico River, Piankatank River, Lynnhaven River, Lafayette River	Ongoing through 2017	\$690,894 external grants to researchers; NOAA Chesapeake Bay Office Field staff time, equipment and vessel operation	NOAA Chesapeake Bay Office	
	ORES Principal Investigators will meet regularly to discuss their research and results.	NOAA, VIMS, UMD, UMCES, VCU, SERC	<u>Maryland</u> : Harris Creek, Little Choptank River, Tred Avon River; <u>Virginia</u> : Great Wicomico River, Piankatank River, Lynnhaven River, Lafayette River	Ongoing through 2017	Staff time and ORES grant (see above)	NOAA Chesapeake Bay Office and ORES Principal Investigators	

	Communicate Results: Develop a plan for future publication of ORES projects and results. Share results with state management agencies. Post regular research updates on NOAA Chesapeake Bay Office websites.	NOAA	<u>Maryland</u> : Harris Creek, Little Choptank River, Tred Avon River; <u>Virginia</u> : Great Wicomico River, Piankatank River, Lynnhaven River, Lafayette River	Ongoing through 2017	Staff time	NOAA	
	Continue compiling information on additional ecosystem services studies and incorporating results where appropriate.	NOAA, MD and VA Interagency Teams	Maryland and Virginia tributaries	Ongoing	Staff time	Staff time from NOAA, MD and VA Interagency Teams	
Track oyster restoration efforts by community groups and efforts in other locations in the Chesapeake Bay.	Collect data from community groups on location and quantity of oysters planted.	MD DNR	Maryland	Ongoing	Staff time	Staff time from MD DNR	
	Provide data for implementation of oyster reef projects at select DoD installations.	DoD (Navy)	DoD installations where applicable	2016/2017	\$720	DoD	
Total							

Management Approach 2: Securing support and resources.

Key Action**	Performance Target(s)	Participating Entity	Geographic Location	Timeline	Estimated Project Cost	Available funding by	Factors Influencing
Restoration partners will continue to meet with funding agencies and organizations to maximize available resources.	Communicate the progress on current restoration efforts to funding agencies and organizations.	MD and VA Interagency Teams	MD and VA	Ongoing	Staff time	Staff time from MD and VA Interagency Teams	Long-term funding to support future construction, seeding and monitoring.
Total							
Restoration partners will work collaboratively to promote efficient, streamlined permitting processes.	Discuss how to preserve leases in restoration areas for future restoration efforts planned for those leased area.	VA Interagency Team, Lynnhaven Team	Lynnhaven River (VA)	2016	Staff time	Staff from USACE, NOAA, VMRC, VIMS, CBF, Lynnhaven River NOW, City of Virginia Beach, Oyster Reefkeepers	Bottom leasing and permitting for restoration project areas.
Total							
Consider the concerns of shell budget and hatchery capacity and how to address future issues.	Discuss the issue of limited shell/substrate resources and hatchery capacity at the February 2016 Oyster Summit hosted by the NOAA Chesapeake Bay Office.	MD and VA Interagency Teams	MD and VA	February 2016	Staff time to attend Oyster Summit	Staff time and travel to the Summit.	Shell/substrate availability and hatchery spat supply.
Explore availability and suitability of alternative substrates for use in reef restoration and hatchery.	Collect information on the availability, price, and performance of potential substrates for use in oyster restoration.	MD DNR, UMCES, ORP	Maryland	2016-2017	Staff time	Staff time from MD DNR, UMCES, ORP	

<p>The Chesapeake Bay Commission will work collaboratively with the Bay Program partners to identify legislative, budgetary and policy needs to advance the goals of the Chesapeake Watershed Agreement. CBC will, in turn, pursue action within our member state General Assemblies and the United States Congress. See CBC Resolution #14-1 for additional information on the CBC's participation in the management strategies.</p>	<p>Work with oyster restoration partners to identify legislative, policy and/or budgetary needs and identify potential actions where feasible.</p>	<p>Chesapeake Bay Commission, MD and VA Interagency Teams</p>	<p>MD, VA</p>	<p>Ongoing</p>	<p>Staff time</p>	<p>Staff time from Chesapeake Bay Commission, MD and VA Interagency Teams</p>	
Total							

Management Approach 3: Future Protection.							
Key Action**	Performance Target(s)	Participating Entity	Geographic Location	Timeline	Estimated Project Cost	Available funding by	Factors Influencing
<p>Maryland, Virginia and the Potomac River Fisheries Commissions natural resources law enforcement agencies will continue to implement and assess the effectiveness of enforcement plans to address poaching.</p>	<p>Improve surveillance techniques and technology where possible.</p>	<p>MD DNR and VMRC</p>	<p>MD and VA</p>	<p>Ongoing</p>	<p>Included in MD DNR and VMRC natural resources law enforcement operating costs.</p>	<p>MD DNR and VMRC</p>	<p>Enforcement</p>
	<p>Promote increased awareness of consequences of poaching.</p>	<p>MD and VA Interagency Teams, MD DNR, VMRC</p>	<p>MD and VA</p>	<p>Ongoing</p>	<p>Staff time</p>	<p>Staff time from MD and VA Interagency Teams</p>	
	<p>Promote Explore the use of alternative materials/substrate as protection for restored reefs.</p>	<p>MD and VA Interagency Teams</p>	<p>MD and VA</p>	<p>Ongoing</p>	<p>Staff time</p>	<p>Staff time from MD and VA Interagency Teams</p>	
	<p>Tributary teams will identify additional considerations for sanctuary reefs that are in close proximity to harvest/seed areas open to industry.</p>	<p>MD and VA Interagency Teams</p>	<p>MD and VA</p>	<p>Ongoing</p>	<p>Staff time</p>	<p>Staff time from MD and VA Interagency Teams</p>	
Total							

Management Approach 4: Approaches Targeted for Local Participation.							
Key Action**	Performance Target(s)	Participating Entity	Geographic Location	Timeline	Estimated Project Cost	Available funding by	Factors Influencing
<p>Conduct outreach to the general public and to stakeholders near selected tributaries or candidate tributaries to inform them and obtain their feedback about restoration efforts.</p>	<p>Conduct stakeholder outreach meetings for local communities near selected tributaries during the restoration planning process.</p>	<p>MD and VA Interagency Teams, VMRC, MD DNR</p>	<p>MD and VA</p>	<p>Ongoing</p>	<p>Staff time</p>	<p>Staff time from MD and VA Interagency Teams</p>	<p>Public support</p>
	<p>Utilize restoration partner websites and the Chesapeake Bay Program website to feature information and progress updates on restoration efforts.</p>	<p>Fisheries GIT</p>	<p>MD and VA</p>	<p>2016</p>	<p>Staff time</p>	<p>Staff time from Fisheries GIT</p>	

Promote stewardship and oyster restoration through oyster gardening programs.	As part of the Marylanders Grow Oyster Program, deliver spat and cages to oyster growers and plant last year's spat in oyster sanctuaries. Deploy Buoyant Oyster Cultivation (BOC) Systems as part of the MD-DNR "Maryland-Grows Oyster Program", in partnership with Chesapeake Beach Oyster Cultivation Society at Naval Research Lab-Chesapeake Beach.	MD DNR, DoD, ORP, UMCES, CBF	Maryland	Ongoing	Variable	Staff time from MD DNR, DoD, ORP, UMCES, CBF	
							Total

MD Interagency Workgroup

NOAA Chesapeake Bay Office (lead)
 USACE Baltimore District
 Maryland Department of Natural Resources
 Oyster Recovery Partnership

Virginia Interagency Workgroup

Piankatank River
 NOAA Chesapeake Bay Office (lead)
 USACE Norfolk District
 Virginia Marine Resources Commission
 Virginia Institute of Marine Science
 The Nature Conservancy
 Chesapeake Bay Foundation

Virginia Interagency Workgroup

Lafayette River
 NOAA Chesapeake Bay Office (lead)
 USACE Norfolk District
 Virginia Marine Resources Commission
 Virginia Institute of Marine Science
 Chesapeake Bay Foundation
 Christopher Newport University
 City of Norfolk
 Elizabeth River Partnership

Virginia Interagency Workgroup

Lynnhaven River
 USACE Norfolk District (lead)
 NOAA Chesapeake Bay Office
 Virginia Marine Resources Commission
 Virginia Institute of Marine Science
 Chesapeake Bay Foundation
 Lynnhaven River NOW
 City of Virginia Beach
 Oyster Reefkeepers

Acronyms

CBF	Chesapeake Bay Foundation
CNU	Christopher Newport University
ERP	Elizabeth River Partnership
Fisheries GIT	Sustainable Fisheries Goal Implementation Team
MD DNR	Maryland Department of Natural Resources
NCBO	NOAA Chesapeake Bay Office
NOAA	National Oceanic and Atmospheric Administration
ORES	Oyster Reef Ecosystem Services
ORP	Oyster Recovery Partnership
PRFC	Potomac River Fisheries Commission
SERC	Smithsonian Environmental Research Center
TNC	The Nature Conservancy
UMCES	University of Maryland Center for Environmental Science
UMD	University of Maryland
USACE	United States Army Corps of Engineers
VCU	Virginia Commonwealth University
VIMS	Virginia Institute of Marine Science
VMRC	Virginia Marine Resources Commission