

Oyster Outcome Sub-Chapter

Oyster Outcome: Increase ecosystem benefits from oysters through reef habitat restoration, sustainable harvest, and aquaculture.

- By 2040, restore or conserve at least 2,000 additional acres of oyster reef habitat concentrated primarily in restoration focus areas to provide ecosystem service benefits.
- Maintain sustainable oyster abundance through oyster fisheries and aquaculture practices.
- Maintain reefs established under the 2014 *Chesapeake Bay Watershed Agreement* to achieve restoration success metrics.

The Oyster Workgroup will oversee Targets 1 and 3, while a dedicated Action Team will spend the next 12 months developing the detailed implementation plan for Target 2. Following this planning phase, the Action Team's efforts will be integrated into the Oyster Workgroup's operations.

The 2025 outcome transitions from a tributary-specific model to a broad, large-scale restoration strategy in focus areas determined by the Oyster Workgroup. This updated framework also facilitates greater participation from community organizations, whose projects will contribute toward the overall acreage targets.

Baseline and Current Condition

Oyster Restoration

The 2014 Chesapeake Bay Watershed Agreement guided the restoration of native oyster habitat and populations in 10 Bay tributaries. Partners achieved this goal in late 2025.

- **Tributaries Restored:** 10 (5 in Maryland, 5 plus a 6th "bonus" tributary in Virginia).
- **Total Reef Habitat Restored (10 Tributaries Initiative):** 1,905 acres.
- **Total Oysters Planted:** 7.3 billion.
- **Total Bay-wide Cost:** \$121.16 million.

Oyster Maintenance

- **Tributaries Restored:** 10 (5 in Maryland, 5 Virginia).
- **Total Reef Habitat Restored (10 Tributaries Initiative):** 1,905 acres.

Oyster Fishery

- **Total acreage of oyster reefs monitored within the fishery (VA & MD):** ~10,000 acres monitored in Virginia.
- **Estimate of non-monitored oyster reef acreage:** Establishing this baseline will require further discussion of the Action Team.
- **Harvest trends in MD and VA:** Harvest is stable and more impacted by market conditions than resource health. In Virginia, the level of harvest is determined by season length and market conditions and is not limited by available resources or the market oyster population.
- **Brief description of sustainable management practices in each jurisdiction (MD, VA, PRFC):** Season lengths, harvest gear, and areas can be adjusted based on condition of the resource (abundance) and the ability to target replenishment effort inputs at a level that can sustain fishing effort. Maryland works with the county Oyster Committees and other stakeholders on closing and opening areas to oystering based on market abundance and effort; seasons and daily limits can be adjusted by public notice based on stakeholder input, survey results, and stock assessments. The

Potomac River Fisheries Commission (PRFC) is advised by its Oyster/Clam Committee and Oyster Strategic Planning Panel to revise seasons, harvest restrictions and areas.

- **Assessments of Population in MD and VA:** Stable or increasing over long-term average. Maryland completed a Benchmark Oyster Stock Assessment in 2024 and is currently working on an update assessment for 2026. A five year review of the Oyster Management Plan will be completed in 2026 to evaluate the management of the public fishery, sanctuaries, and aquaculture sectors to the objectives in the plan.
- **Aquaculture baseline VA:** Containerized hatchery-based aquaculture (surface and bottom cages) production is stable or increasing over 10-year average.
- **Aquaculture baseline MD:** Maryland's hatchery-based oyster aquaculture has grown steadily in both scale and production since the state overhauled its leasing and permitting system in 2010. Most operations are relatively small, averaging about 20 acres, with leaseholders managing just one or a few plots. Roughly 20 percent of these businesses use intensive containerized gear, while the remainder focus on extensive bottom culture.

Monitoring Progress and Indicators

2,000-Acre Reef Restoration Goal

- **Indicator:** The primary indicator will be the number of restored reef acres that meet the updated success metrics. NOAA will lead a process to evaluate the 2014 Chesapeake Bay Watershed Agreement metrics and recommend revised standards for the 2025 outcome.
- **Monitoring:** Future monitoring will focus on ensuring the 2,000 acres of restored or conserved reefs meet revised success metrics as determined by the oyster success metrics review process.
- **Reporting:** Implementation and performance tracking will be the responsibility of the Oyster Workgroup.

Maintenance (Stewardship) of '10 tributaries'

- **Indicator:** The workgroup will consider continuing the current success metrics for these areas or developing new metrics through the review process.
- **Monitoring:** When revised oyster metrics are available, the Oyster Workgroup will identify specific indicators and monitoring protocols to apply to this target.
- **Reporting:** Performance assessments will be based on monitoring results, and tracking will be the responsibility of the Oyster Workgroup.

Oyster Fishery

The Oyster Fishery and Aquaculture Action Team will spend the next 12 months developing a detailed implementation plan including indicators.

- **Indicator:** TBD by Oyster Fishery and Aquaculture Action Team.
- **Monitoring:** TBD by Oyster Fishery and Aquaculture Action Team.
- **Reporting:** TBD by Oyster Fishery and Aquaculture Action Team.

Oyster Outcome Situation Analysis

The following table identifies critical challenges that may impact progress towards attaining the 2040 Oyster Outcome and its targets. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*).

Challenges	Within CBP Sphere of Influence	Outside CBP Sphere of Influence
Funding for long-term restoration and monitoring	X	
Permitting and regulatory compliance	X	
Environmental changes (temperature, salinity, disease, oyster reproduction levels)*		X
Funding for seed production capacity	X	
Substrate availability, cost and acceptability	X	
Maintaining reef structural integrity		X
Public outreach, coordination and support	X	

Snapshot of Signatory Programs

This section highlights critical existing programs supporting oyster restoration and sustainability.

Oyster Restoration and Maintenance

- **Maryland Department of Natural Resources:** Manages the resource, conducts monitoring, outreach, and enforcement. Funding for reef construction, oyster spat on shell or substrate planting, and adaptive management.
- **NOAA Chesapeake Bay Office:** Funding for oyster seeding, monitoring, scientific research, and partner planning and coordination.
- **U.S. Army Corps of Engineers (Baltimore & Norfolk Districts):** Funding and technical support for reef construction, monitoring, and adaptive management.
- **University of Maryland Horn Point Oyster Hatchery:** Production of the vast majority of spat-on-shell larvae for Maryland tributaries, with NOAA and MD DNR funding.
- **Virginia Marine Resources Commission:** Reef construction, monitoring, and coordination of adaptive management on existing reefs.
- **NGOs:** National, River and Watershed groups assisted with reef construction, local knowledge, and public engagement.
- **Academics:** Monitoring; research.

Oyster Fishery

Public Ground (Wild Harvest)

- **Maryland:** In Maryland's portion of the Chesapeake Bay, variable salinity and temperature regimes are the primary environmental determinants of oyster population dynamics due to their influence on reproduction, growth, and mortality. The oyster fishery is dominated by the commercial sector. Recreational catch is unknown but assumed to be small due to the difficulty of finding and collecting oysters subtidally using hand gears along with the relatively small number of calls received by staff by recreational fishermen.

Individuals must have a Maryland commercial fishing license to commercially harvest oysters on public bottom. In addition to their annual license fee, these licensees must pay an annual oyster surcharge fee of \$300 in order to activate their license to harvest oysters prior to each season. Seafood dealers buying oysters are required to pay a \$2 tax per every bushel purchased and an additional \$1 tax on oysters shipped in the shell out of the state; these funds along with the oyster surcharge are required to be used by Maryland DNR for oyster shell and seed purchase and planting on public oyster bars for enhancement purposes. Fishery priorities include obtaining the needed substrate, hatchery spat, and funding to continue assisting fishery enhancement efforts to boost Maryland's seafood economy. Annual decisions on the harvest rules (bushel limits, times, area closures, etc.) are based on survey and stock assessment data and will continue to be made with the resource and sustainability in mind. Monitoring and data priorities include continuing the long-term annual Fall Oyster Survey and other surveys to assess the status of the population, improving the harvest data records which are needed to understand the fishery and build the stock assessment, and to continue the stock assessment using these and other data sources.

- **Virginia:** The Virginia fishery is nearly evenly split between traditional harvest on public oyster ground, primarily during the fall and winter months, and traditional harvest on private oyster leases, during the warmer summer and spring months, with some months of overlap. A significant proportion of harvest areas on both private and public grounds have been heavily and continually manipulated by both harvest and repeated shell or other substrate plantings for many decades. The productivity of both the majority of public and private ground fishery is dependent on a combination of natural recruitment and shell or seed inputs.
- **PRFC:** Commercial harvest in the mainstem of the Potomac River is solely from public oyster grounds during the fall and winter months. The majority of harvest is from hand scrape, a smaller version of a typical dredge no greater than 22 inches wide. The PRFC sets harvest restrictions annually based on survey results and stakeholder feedback. Each harvester is required to pay a \$300 planting surcharge fee each year while each oyster buyer must pay a \$2 tax per bushel purchased; both of these funding sources go towards replenishment activities. Many of the historic oyster grounds in the Potomac River have received shell and/or seed plantings since the PRFC's inception in 1958.

Aquaculture (Private Ground)

- **Maryland:** The majority of oyster aquaculture (80% of leases) is from extensive bottom culture where leaseholders manage their operations similarly to a put-and-take fishery and typically use the same gear as on public grounds. The remaining 20% of leases use containerized culture systems, either floating or on the bottom. Production has, on average, increased since a

regulatory overhaul in 2010 with bottom culturing producing the majority of private landings, 66-75%. Oyster leases are held to an active use requirement that has contributed to an average yield of 13 bushels per acre of private production and ensures that any non-productive lease areas are returned to the public fishery.

- **Virginia:** Containerized hatchery-based aquaculture compromises ~20% of total Virginia commercial oyster landings, and ~40% of total private landings in recent years. The remaining 60% of harvest from private ground is "extensive" aquaculture, is not containerized and is harvested with gears similar to those used on public ground. This segment of oyster production has seen steady growth over the last two decades.
- **PRFC:** There is no aquaculture in the mainstem of the Potomac River at this time.

Management Approaches for Outcome 5: Oysters

Management Approach 1.5.1: Strategic Expansion of new Oyster Reef Habitat Restoration or Conservation:

Partners recognize the success achieved from focused large-scale restoration and intend to apply a similar collaborative approach to restore or conserve 2,000 additional acres of non-harvest oyster reef that follows these key elements:

- **Clear Shared Goal:** Unify regional stakeholders under this single, well-defined restoration target.
- **Strategic Partnerships:** Leverage federal, state, and non-profit strengths to expand operational capabilities.
- **Collaborative Planning:** Jointly design and execute synchronized, in-the-water restoration projects.
- **Collective Metrics:** Use shared science-based protocols to ensure accountability and adaptive management.
- **Engaged Public and Sustained Resources:** Foster community stewardship and secure reliable funding pipelines.

More specifically, the Oyster Workgroup anticipates that implementing restoration or conservation for 2,000 additional acres of non-harvest oyster reef habitat primarily in defined restoration focus areas will require:

- Defining "restoration focal areas," including specific acreage thresholds.
- Identifying locations for the additional 2,000 acres (approximately 1,100 acres in Maryland and 900 acres in Virginia).
- Developing restoration implementation plans in coordination with multiple partners.
- Establishing a process to include and account for community-based restoration projects.
- Establishing revised success metrics to evaluate oyster restoration performance.
- Develop a monitoring program based on the revised oyster metrics.

Management Approach 1.5.2: Adaptive Management and Monitoring:

Continue monitoring tributaries previously restored under the 2014 Chesapeake Bay Watershed Agreement to ensure they meet revised success metrics. Utilize monitoring data to guide adaptive management to ensure these tributaries continue to provide ecosystem services and remain protected as non-harvest areas through 2040.

Establish revised success metrics to evaluate oyster restoration or conservation performance for areas established under the 2025 Chesapeake Bay Watershed Agreement and develop a monitoring program

based on these revised oyster metrics.

Management Approach 1.5.3: Sustainable Oyster Fishery and Aquaculture in each Jurisdiction:

An Action Team will be established to collaborate with jurisdictions to:

- Define sustainable commercial oyster harvest and aquaculture practices.
- Provide recommendations to each jurisdiction based on these definitions and establish coordination between state and federal partners.

The recommendations from this Action Team will be integrated with the Oyster Workgroup for implementation.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, “participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices” (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners:**
 - Maryland Department of Natural Resources
 - Virginia Marine Resources Commission
 - National Oceanic & Atmospheric Administration
 - Chesapeake Bay Commission
- **Other Partners:**
 - Potomac River Fisheries Commission
 - U.S. Army Corps of Engineers
 - Oyster Recovery Partnership
 - Chesapeake Bay Foundation
 - Christopher Newport University
 - Virginia Institute of Marine Science
 - Smithsonian Environmental Research Center
 - Community based organizations

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The law and regulation of signatory partners may support, justify or motivate their participation in the collaborative work of the Chesapeake Bay Program related to the attainment of specific Outcomes and Targets of the Watershed Agreement.

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While

Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner's participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans.

Outcome: Oysters	
Signatory	Statutory Authority
Maryland Department of Natural Resources	Natural Resources Article, § 4-1001 - § 4-1020, Annotated Code of Maryland
	Part of Maryland's authority for the oyster sanctuaries and public fishery management is provided under Natural Resources Article Title 4 Subtitle 10 - Oysters and Clams.
Maryland Department of Natural Resources	Natural Resources Article, 4-11A-01 - 4-11A-24, Annotated Code of Maryland
	Aquaculture is provided in Natural Resources Article Title 4 Subtitle 11A -Aquaculture.
Maryland Department of Natural Resources	Natural Resources Article, § 4-215, Annotated Code of Maryland
	All three sectors, (sanctuaries, public fishery and aquaculture) are all managed under the objectives in the Oyster Management Plan . Subsequent Code of Maryland Regulations are authorized under MD Natural Resources Code § 4-215.
Virginia Marine Resources Commission	Code of Virginia Chapter 5
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Virginia Marine Resources Commission	Code of Virginia Chapter 6
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Virginia Marine Resources Commission	Code of Virginia Chapter 12
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Potomac River Fisheries Commission	Maryland and Virginia Potomac River Compact of 1958
	The PRFC has authority to manage the oyster fisheries within the mainstem of the Potomac River under the Maryland and Virginia Potomac River Compact of 1958.