

CHESAPEAKE BAY

DRAFT Primer



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NFWF



US Army Corps
of Engineers®

This document was developed in coordination with multiple stakeholders, including the Chesapeake Bay Program, U.S. Fish and Wildlife Service, District of Columbia, states of Delaware, Maryland, New York, Virginia, West Virginia, and commonwealths of Pennsylvania and Virginia.

Primer

INTRODUCTION

The Chesapeake Bay is the nation's largest estuary. The bay watershed, covering over 64,000 square miles across six states and the nation's capital, extends from the headwaters of the Susquehanna River in New York to the confluence of the estuary with the Atlantic Ocean in tidewater Virginia (**Figure 1**). As the nation's largest estuary, the Chesapeake Bay Watershed is one of national significance, representing a highly diverse and biologically important region of the United States.

The Chesapeake Bay Comprehensive Water Resources and Restoration Plan (CBCRP) is a watershed assessment intended to inform multiple audiences and decision makers at all levels of government, and provide a strategic roadmap for future investments into aquatic ecosystem restoration. The U.S. Army Corps of Engineers (USACE) and the National Fish and Wildlife Foundation (NFWF) led the preparation of the CBCRP. The U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, and the Chesapeake

Bay Commission were included in the development of the CBCRP. Through stakeholder collaboration and discussion, the shared vision for the CBCRP aligns with the [2014 Chesapeake Bay Watershed Agreement](#) (2014 Bay Agreement) and the desire for watershed and community resilience.

The Chesapeake Bay Watershed is home to more than 18 million people, and important species (e.g., rare, threatened, and endangered) and their habitat, providing immense ecological, cultural, economic, historic, and recreational value. The primary challenge facing the Chesapeake Bay is degradation of the structure and function of the aquatic ecosystem resulting from human actions in and around the Bay watershed. Problems such as increased development and population, unmanaged stormwater, land use alteration, and runoff from agricultural lands coupled with sea level

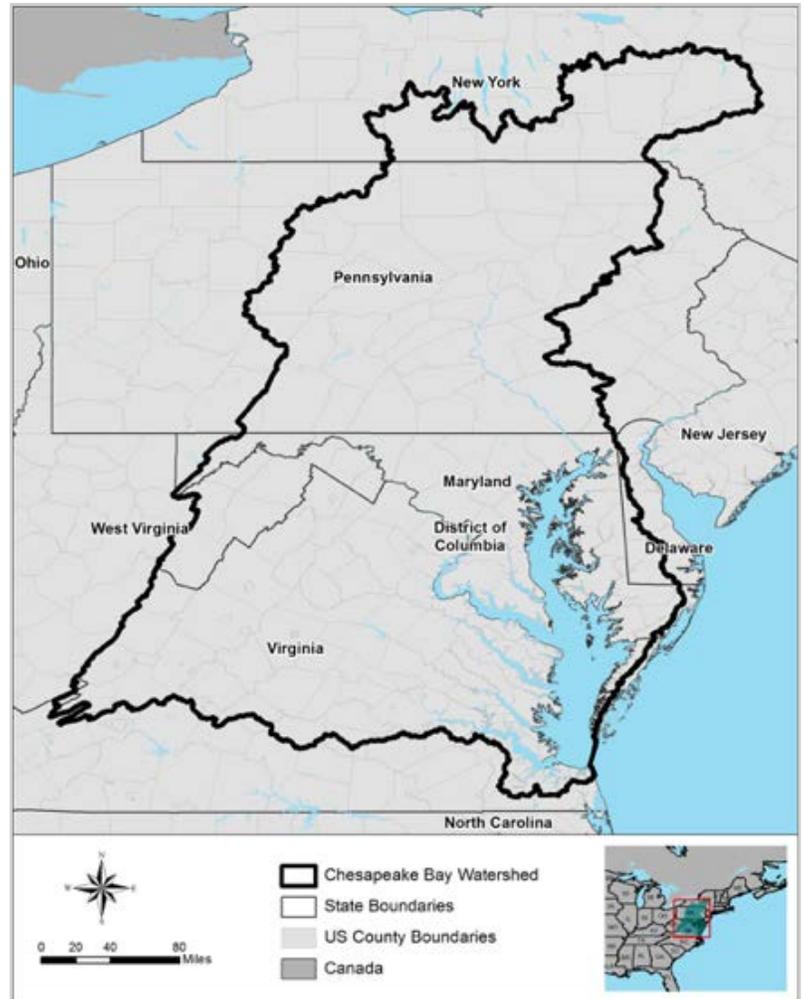


Figure 1. Chesapeake Bay Watershed

We envision an environmentally and economically sustainable and resilient Chesapeake Bay Watershed with clean water, abundant life, conserved lands and access to water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders.

and climate change have led to ecosystem degradation and a less resilient Chesapeake Bay. Consequences of human actions and climate change stressors in and around the Chesapeake Bay Watershed have been well documented.

USACE has been involved in water resources management across the Chesapeake Bay Watershed since the early 1800s. Over the past 200 years, approaches have evolved to meet the needs of the nation, and more recently include managing water resources systems regionally; developing a continuum of structural, non-structural, and programmatic solutions; and integrating collaborative approaches and financing across governmental and non-governmental sectors to address challenges.

The primary goal of the CBCP, as directed by Congress by authorization language contained in Section 4010(a) of the Water Resources Reform and Development Act of 2014 (WRRDA 2014), is to provide a single comprehensive and integrated restoration plan to assist with implementation of the 2014 Bay Agreement by:

- ◆ Effectively and efficiently engaging Bay stakeholders to identify problems, needs, and opportunities in the watershed and avoid duplication of ongoing or planned actions by others;
- ◆ Leveraging existing geospatial data to identify locations for restoration opportunities to maximize co-benefits (the set of multiple benefits or synergies returned from an explicit action to address multiple 2014 Bay Agreement outcomes) and making the most efficient use of implementation resourcing; and
- ◆ Determining where and how USACE programs could be used to support implementation.

Significant achievements have been made since the first Chesapeake Bay Agreement in 1983, but increased technical assistance and implementation is needed—particularly when considering ongoing stressors associated with development pressures and uncertainty surrounding climate change impacts. In addition, opportunities identified in the CBCP may be considered for USACE assistance through the following authorities and programs.

CONSEQUENCES OF HUMAN ACTIONS AND CLIMATE CHANGE STRESSORS

- ◆ Diminished fisheries resources;
- ◆ Loss and degradation of tidal and nontidal wetland habitats;
- ◆ Reduced connectivity of aquatic habitat and riparian buffers;
- ◆ Loss and degradation of submerged aquatic vegetation (SAV);
- ◆ Impaired stream health and function;
- ◆ Fish passage blockages;
- ◆ Shoreline and stream bank erosion/floodplain disconnection;
- ◆ Flooding and coastal storm damages; and,
- ◆ Water pollutants and chemical contaminants.

USACE Programs

Planning Assistance to States	Technical assistance supporting state water resources management plans and comprehensive water resource planning
Floodplain Management Services Program	Technical assistance for managing flood hazards and floodplains
Interagency and International Support (Military Installations and Economy Act – other federal agencies)	Technical assistance to support other non-DOD federal agencies, state and local governments, and tribal nations on a reimbursable basis
Continuing Authorities Program	Small aquatic ecosystem restoration projects (Section 206) Shoreline and streambank stabilization (protecting essential public works) (Section 14) Environmental modifications to previous USACE projects (Section 1135) Beneficial use of dredged material for ecosystem restoration (Section 204) Coastal storm damage reduction/shore protection (Section 103)
Chesapeake Bay Environmental Restoration and Protection (Section 510)	Limited study, technical design and/or construction assistance to non-federal interests for environmental projects that support the restoration and protection of the Chesapeake Bay estuary
Design/Build (Section 219, 313, 567, 571 Programs)	Limited study, design, and construction of environmental and water infrastructure projects
General Investigations	Large-scale, Congressionally-authorized aquatic ecosystem restoration investigations leading to a USACE project for implementation with a cost-sharing partner
Operations and Maintenance	Maintenance of navigation channels and regional sediment management of dredged material, which serves as a resource for aquatic ecosystem restoration actions

PLANNING ANALYSES

Geospatial analyses were the primary methodology used to investigate the Chesapeake Bay Watershed problems, needs, and opportunities. The intent of the analyses was to identify high-quality areas for potential conservation, degraded areas for restoration, gaps in restoration actions, and duplication of efforts. The result of the geospatial analyses is the *Restoration Roadmap*, which presents those areas of the watershed that align with 2014 Bay Agreement goals and outcomes, or co-benefits.

Approximately 170 spatial data layers were obtained from NFWF and from federal, state, and local agencies, academia, and non-governmental organizations (NGOs). Initially, data layers were synthesized around the following eight topics:

1. Identified priorities by stakeholders
2. Restoration actions
3. USACE mission analyses and military lands
4. Healthy/high-value habitat
5. Connectivity
6. Stressors
7. Threats
8. Socioeconomics

The output from the geospatial analyses was used to spatially identify opportunities for enhancement (improvements to habitat quality or function), restoration (improvements to habitat quantity and quality), and conservation (preservation actions to promote sustainability and resilience) in alignment with 2014 Bay Agreement goals and outcomes, as well as opportunities to address future threats (build resiliency) in the watershed. Results are presented at three scales: (1) a baywide analysis (Restoration Roadmap), (2) a jurisdiction (state and District of Columbia jurisdictional boundary) analysis (State and the District of Columbia Annex), and (3) a watershed analysis (State-Selected Watershed Action Plans).

FINDINGS AND RECOMMENDATIONS

In collaboration with the Chesapeake Bay Partnership (Partnership) and numerous other stakeholders, the planning analyses identified a set of subwatersheds as *Opportunities*. The *Opportunities* are optimum locations to implement various strategies and actions to most efficiently meet the 2014 Bay Agreement goals and outcomes.

Figure 2 presents the Restoration Roadmap, which is the synthesis of the individual *Opportunities*. The *Restoration Roadmap* highlights those subwatersheds where strategies align with multiple 2014 Bay Agreement goals and outcomes, and therefore, hold the potential to address multiple problems and provide co-benefits. The Restoration Roadmap was formulated by tabulating the number of times an individual subwatershed was identified as an *Opportunity* across all analyses. The estuarine subwatersheds could have been identified as an *Opportunity* a maximum of 16 times (i.e., in 16 different geospatial analyses), while the maximum potential score for non-estuarine subwatersheds is 10. In other words, the Restoration Roadmap is the result of a compilation of the *Opportunity Assessments*, presenting which subwatersheds would have the higher probability to generate co-benefits for investments made. Further explanation including how the *Opportunities* represent 2014 Bay Agreement goals and outcomes is provided in the main report and in the Planning Analyses Appendix.

The Restoration Roadmap is a geographic optimization that can steer project implementation in an efficient manner. By compiling results across all analyses, the Restoration Roadmap informs decision-makers where the potential exists to have the greatest impact on achieving the 2014 Bay Agreement goals and outcomes, and is

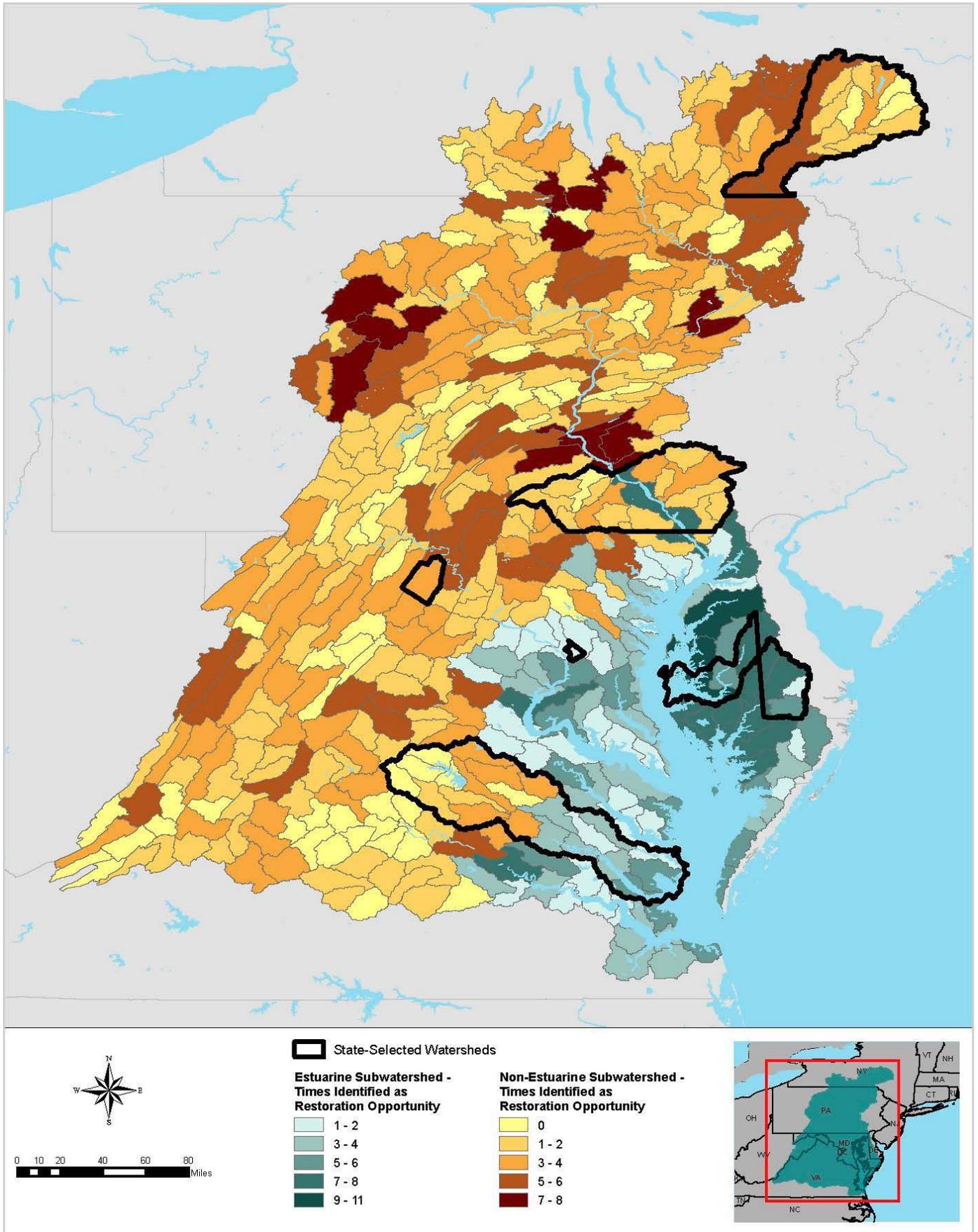


Figure 2. Restoration Roadmap

a vehicle for achieving co-benefits. With limited funding and resources, an emphasis was placed on co-benefits and the ability to focus implementation of restoration actions in areas where multiple efforts and benefits could be realized. However, this is not to say that actions would not be beneficial in other subwatersheds across the watershed. There may be extensive benefits realized locally, and implementation of restoration and conservation opportunities could and should be considered wherever those opportunities exist. Moreover, there may be additional restoration and conservation opportunities like those already identified that are presently not captured in the CBCP analyses and outputs due to time and resource constraints, but which should be considered for implementation.

Each jurisdiction identified a watershed for development of an action plan. These areas are outlined in black on the Restoration Roadmap and serve as examples of what could be completed throughout the Chesapeake Bay Watershed. The State-Selected Watershed Action Plans outline specific strategies and opportunities for restoration and conservation. They will be refined following stakeholder and public review to also provide a list of specific projects for potential implementation. Additionally, stakeholders have provided lists of candidate projects within their jurisdictions (not limited to subwatershed action plan boundaries) for inclusion in the CBCP. A candidate restoration project can be any conceptual strategy or site-specific location where a project is envisioned, is undergoing active planning or design, or is ready for construction. A full list of candidate projects is presented online at <http://www.nab.usace.army.mil/Missions/Civil-Works/Chesapeake-Bay-Comprehensive-Plan/>.

The following table summarizes the *Opportunities* and candidate restoration projects in each selected watershed based on the *Restoration Roadmap*, action plans, and stakeholder input. This list will be revised as additional information is provided by stakeholders and the action plans are finalized.

Jurisdiction	Candidate Projects			Types of Potential Projects
	Candidate Projects Identified*	Projects within USACE mission areas**	Projects outside USACE mission areas**	
D.C.	316			stream, wetland, and SAV restoration; stormwater management; living shoreline; fish passage
NY	5			riparian buffer, stream, and wetland restoration; fish passage; agricultural best management practices (BMPs)
PA	881			riparian buffer, stream, and wetland restoration; conservation; acid mine drainage; agricultural BMPs; fish passage
MD	2,592			oyster, SAV, riparian buffer, stream, and wetland restoration; living shorelines/ shoreline stabilization; agricultural BMPs; conservation; fish passage
VA	43			oyster, SAV, riparian buffer, stream, and wetland restoration; living shorelines/ shoreline stabilization; agricultural BMPs; conservation; fish passage
DE	1			riparian buffer, stream, and wetland restoration; conservation; fish passage; agricultural BMPs
WV	2			riparian buffer, stream, and wetland restoration; fish passage; wastewater management; conservation

*Projects included are those submitted by stakeholders, potential (currently unfunded) USACE projects, or those previously identified in USACE-led watershed plans. This project inventory will be updated with additional stakeholder input and to include projects identified through the CBCP in the state-selected watershed action plans. In response to Implementation Guidance for Section 4010(a) of the WRRDA 2014, at least one candidate project has been identified, thus far, in each jurisdiction.

**This information will be completed for the final report.

USACE fulfills a unique and critical role in this era of Chesapeake Bay restoration. Capabilities span from technical assistance and action plan development for small watersheds to regional studies and design and construction. Aquatic ecosystem restoration, navigation, beneficial use of dredged material, flood and coastal storm risk

management, and integrated water resources management are all within the realm of USACE expertise. USACE can leverage partnerships and funding within the U.S. Department of Defense (DOD), other federal and state agencies, local jurisdictions, NGOs, and private entities. For ongoing USACE efforts, the following projects and programs are a sample of how USACE has and will continue to provide substantial contributions toward the 2014 Bay Agreement goals and outcomes:

- ◆ Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island, Maryland and its expansion
- ◆ Mid-Chesapeake Bay Island Ecosystem Restoration, Maryland
- ◆ Elizabeth River Ecosystem Restoration, Virginia
- ◆ Lynnhaven River Ecosystem Restoration, Virginia
- ◆ Anacostia Watershed, Prince George’s County, Maryland Ecosystem Restoration
- ◆ Chesapeake Bay Oysters Restoration Program
- ◆ Upper Susquehanna Comprehensive Flood Damage Reduction, New York
- ◆ Washington, District of Columbia and Vicinity Local Flood Protection
- ◆ Operations and Maintenance of navigation systems
- ◆ Stewardship at USACE reservoirs
- ◆ Technical assistance offered through the Planning Assistance to States and Floodplain Management Services
- ◆ Continuing Authorities Program
- ◆ Chesapeake Bay Environmental Restoration and Protection Program (Section 510)
- ◆ Silver Jackets Program
- ◆ Chesapeake Bay Program support

The Chesapeake Bay Environmental Restoration and Protection Program, (Section 510 of the Water Resources Development Act of 1996, as amended) provides a reinvigorated opportunity for USACE to partner with non-federal sponsors to design and construct restoration projects. WRRDA 2014 provided further direction as to how to use Section 510 to enable USACE to support the restoration effort. As part of the completion of the CBCP, Congress directed the identification of projects for the following categories: sediment and erosion control, protecting eroding shorelines, ecosystem restoration (including SAV), protection of essential public works, beneficial use of dredged material, and other related projects that may enhance the living resources of the estuary.

USACE efforts that can contribute to the 2014 Bay Agreement goals are described in the Main Report, and included in the Restoration Roadmap and in the Candidate Restoration Project Opportunity Database. The Candidate Restoration Project Opportunity Database cannot represent an all-inclusive list of potential projects due to the short duration of this study, expansive watershed size, diversity of challenges to be addressed, and extensive set of agencies and programs active throughout the basin. The Restoration Roadmap and the State and District of Columbia Annex can be used to guide implementation.

In summary, the following tables present the primary findings and recommendations of the CBCP. Figures refer to those in the main report.

CBCP Primary Findings and Recommendations

INTEGRATED WATER RESOURCES MANAGEMENT	There are broad baywide opportunities to contribute to meeting 2014 Bay Agreement goals and outcomes. The CBCP has identified <i>Opportunities</i> for specific restoration and conservation and a comprehensive Restoration Roadmap (Figure 2).
	Promote integrated water resources management and plan for future threats.
	Opportunities exist to integrate solutions for future threats, strategies for improving habitat connectivity and building resiliency, and considerations for incorporating species of concern into implementation.
RESTORATION	Optimize actions geographically to maximize benefits and contributions toward the 2014 Bay Agreement goals and outcomes.
	The Restoration Roadmap and <i>Opportunity</i> maps represent a range of local or regional actions that could be achieved with focused investments.
	Address watershed stressors in degraded areas prior to, or in conjunction with, habitat restoration actions.
	Track actions to manage implementation of restoration actions, in addition to tracing water quality metrics and habitat.
CONSERVATION	Promote conservation/enhancement opportunities adjacent to existing healthy/high-value habitat and in concert with restoration efforts.
POLICY	Regulations, laws, and policies vary across state jurisdictions and its subdivisions, and the District of Columbia. There are opportunities to focus planning and zoning policy on preserving high-ranked healthy habitats, wetland migration corridors, and socioeconomic areas at risk.
IMPLEMENTATION	Stakeholders are engaged and motivated. Extensive plans and priorities have been identified. Primary interest is focused on how to identify technical assistance and funding to implement projects.
	Action plans, similar to those developed for the state-identified watersheds in the CBCP, are critical for every subwatershed in the Bay.
	Cost efficiencies, innovative financing, and expanding partners and markets will be key to getting projects in the ground at a faster pace and at a larger scale than what has been done to date.
	Encourage, develop, and support relationships including innovative financing partnerships.

FUNDING AND IMPLEMENTATION

Funding requirements to support the restoration effort across the 64,000-mile Chesapeake Bay Watershed and within the six states and the District of Columbia will require continued support. Almost \$2 billion was invested in fiscal year 2017, including approximately \$569 million from seven of the agencies that comprise the Federal Leadership Committee (FLC) of the Chesapeake Bay¹ and approximately \$1.41 billion from the seven watershed jurisdictions (Chesapeake Progress 2018). USACE activities have and will continue to complement ongoing conservation and restoration actions across the watershed.

Investments are producing visible results. In 2017, the total acreage of SAV exceeded 100,000 acres for the first time since restoration efforts began. An estimated 104,843 acres were documented by aerial surveys, marking a third year of increasing SAV coverage. SAV are a good indicator of Bay health because they are sensitive to pollution and respond quickly to improved water quality. Other indicators of improving Bay health are blue crab abundance, nitrogen and phosphorus reductions, and broader achievement of water quality standards.

Actions undertaken by USACE may be pursued under technical services programs (Planning Assistance to States; Floodplain Management Services Program), Interagency and International Support (cost-reimbursable), Section 510, Design-Build Authorities (Sections 219, 313, and 567), Continuing Authorities Program, and specifically authorized investigations and construction.

¹ The FLC for the Chesapeake Bay includes the EPA and Departments of Agriculture, Commerce, Defense, Homeland Security, and the Interior.

Innovative Financing Is the Future of Restoration Success

In addition to traditional USACE funding that generally requires federal funding matched with non-federal sponsor funding, there are opportunities for innovative financing that will be a pathway for future restoration success in the watershed. In 2016, the Chesapeake Bay Environmental Finance Symposium noted that all participants in bay restoration, public and private, have a role to play in creating a set of key “enabling conditions” that set the stage for successful interaction with the market and private sector: (1) allowing flexibility in how projects are designed, financed, and implemented; (2) fostering consistency and predictability in market demand, permitting, procurement, and regulatory enforcement; (3) developing shared or integrated standards for the water quality and restoration marketplace; and, (4) boosting broad-scale demand for restoration.

The Symposium highlighted the diversity in the private sector; the broad range of functions and benefits within that sector; and the readiness of the private sector to engage, invest, and advance restoration activities. Across the region, there are examples of successful market-based financing programs and local and state governments creating the conditions for success. Actions identified in the CBCP, including those for USACE, create opportunities for establishing innovative financing processes and programs, including linking private capital with public sector investment through pay-for-success programs and public-private partnerships to reduce implementation costs.

INSTITUTIONAL AND OTHER BARRIERS TO RESTORATION SUCCESS

There are numerous factors influencing restoration progress. Of these factors, three of the most significant issues include funding availability; the capacity of organizations to tackle issues within their jurisdiction; and consolidated tracking between local, state, and federal governments, and NGOs to plan and implement projects. Some barriers may prevent reaching outcomes if not addressed, while others only influence and limit the ease, speed, and effectiveness of actions taken.

Evolving Project Partnering Opportunities

There are current policy restrictions that inhibit the ability to leverage existing resources to completely fulfill commitments between federal agencies and state or local agency partnerships. For example, USACE projects require a cost-sharing contribution by non-federal sponsors for a potential project. Oftentimes, funding received as a grant to a state or local agency from a federal agency has limitations associated with using those funds as cost-sharing contributions for USACE projects. Only funds specifically made available by Congress with the stipulation for cost-share use with other federal efforts can be used for USACE projects.

There may be instances where policies and procedures for flood risk management, conservation, and restoration conflict. Specifically, property restrictions or easements provided for one purpose may not be conducive to other purposes. For example, when a property acquisition is made in flood-prone areas to remove and demolish structures that incur repetitive flood losses, that area could be used for habitat restoration and floodplain reconnection following clearing of the property. The re-established open space may not be available for a future aquatic ecosystem restoration project because of a restriction in the real estate acquisition process that precludes any structure on the parcel including an aquatic ecosystem restoration project feature.

Funding Constraints

Additional funding resources could improve progress. Non-federal partners have been constrained in their ability to undertake cost-shared restoration projects because of the need to devote limited resources to meet water quality regulatory requirements, thereby reducing their ability to partner on aquatic ecosystem restoration projects that provide improvements to species and their habitat. Flexibility to develop creative partnerships and innovative financing is critical. USACE technical assistance programs are a discretionary part of the federal budget; however, they are some of the most popular and most valuable programs to assist local communities and states. These programs also include provisions to develop public-private partnerships.

Land Ownership

Thus far, implementation of projects on public lands (i.e., parks and schools) has been an easier process than doing so on private lands. Partnering with USACE entails setting aside project lands into a permanent easement. As a result, a number of issues related to land ownership lead to difficulties for private land owners to partner with USACE to implement projects on their lands:

- ◆ USACE policies require landowners to establish permanent easements for restoration projects.
- ◆ Implementation and maintenance costs may be cost-prohibitive to a private land owner.
- ◆ High density populations in urban areas result in the need to partner with multiple land owners for a single project.
- ◆ Large tracts of land are held by other Federal agencies.
- ◆ Significant portions of agricultural lands are owned by Amish and other Old Order groups, particularly in southern Pennsylvania. These groups have been resistant to accepting government assistance in the past due to their religious beliefs.

These challenges have the potential to limit restoration efforts. To meet 2014 Bay Agreement goals and outcomes, restoration efforts will require the active participation of private landowners and not rely solely on project opportunities located on public lands.

NEXT STEPS

The CBCP provides a roadmap for integrated water resources management as the Partnership prepares for the next phase of the Chesapeake Bay restoration effort and seeks to maintain the gains made on past investments. USACE continues to be an active participant in the restoration effort, and opportunities exist to provide extensive technical assistance and to study, design, and construct restoration projects.

The Chesapeake Bay Watershed is a dynamic system of systems. The 2014 Bay Agreement acknowledged that progress must be made in a strategic manner and to focus restoration success to maximize the benefits to the communities across the region. The CBCP assists in the next steps to guide the implementation of actions, seeking to maximize co-benefits, and to identify how USACE can continue to support the Partnership.



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