



# DoD CHESAPEAKE BAY PROGRAM JOURNAL

Edited by the DoD Chesapeake Bay Program Team

PROTECTING THE CHESAPEAKE BAY FOR MILITARY READINESS, FOR OUR COMMUNITY, FOR FUTURE GENERATIONS

## A Look Back at the State of the Bay in 2020

By the Department of Defense (DoD) Chesapeake Bay Program (CBP) Team

Every two years, the Chesapeake Bay Foundation (CBF) releases the State of the Bay report, which evaluates the health of the Bay across three major categories: pollution, habitat, and fisheries. Within each category are indicators, such as nitrogen, phosphorus, wetlands, and oysters. Each indicator is scored from 1 to 100 and assigned a grade from A to F based on monitoring data and CBF's field observations. As a partner in the Chesapeake Bay restoration, DoD contributes to the health of the Bay, as measured in the 2020 State of the Bay, and to its future wellbeing.

The 2020 Health Index score is 32 (D+), a one point decrease from 2018. As seen in the report card to the right, the reduction in the Chesapeake Bay's overall score is largely a result of negative outcomes for the rockfish. Overall, six of the thirteen health indicators show improvement, including four pollution indicators (nitrogen, phosphorus, dissolved oxygen, and water clarity). This is good news for the partners implementing the Chesapeake Bay Total Maximum Daily Load (TMDL), including DoD installations, that have worked hard to reduce pollutant loads since 2010. In addition to water quality, oysters and blue crabs have also shown improvements compared to 2018, demonstrating the results of dedicated efforts, including those by DoD installations, to improve habitat for these key Chesapeake Bay species.

Unfortunately, the 2020 State of the Bay report shows no overall improvement, and in some cases a decline, in habitat health. However, because there is a lag between a project's completion and when its benefits become clear, the results of today's projects will continue to improve the index scores in future reports. Therefore, DoD's ongoing initiatives to protect, enhance, and create wetlands, as well as restore streams and shorelines, through the Sikes Act and land conservation programs are very important to the preservation of these cornerstone environments and the greater health of the Chesapeake Bay. DoD can also help support forested buffers. Riparian forest buffers provide co-benefits for water quality, flood prevention, and habitat, making them a win-win practice for DoD installations. Riparian forest buffers installed since 2010 treat over 80 acres of land at DoD installations. In addition, DoD's ongoing efforts to restore streams and shorelines can provide mutual co-benefits for forested buffers, wetlands, and underwater grasses. This represents a strategic opportunity for DoD to contribute to habitat and water quality in the Bay watershed.

The full State of the Bay report with a complete list of scores and details about 2020 conditions is available online at <https://www.cbf.org/document-library/cbf-reports/2020-state-of-the-bay-report.pdf>.

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Department of Defense

OFFICE OF PREPUBLICATION AND SECURITY REVIEW				
2020 Health Index: 32 D+				
-1 from 2018				
	Indicator	2020 Score	Change From 2018	Grade
POLLUTION	Nitrogen	17	+5	F
	Phosphorus	27	+8	D
	Dissolved Oxygen	44	+2	C
	Water Clarity	17	+1	F
	Toxics	28	0	D
HABITAT	Forested Buffers	56	-1	B
	Wetlands	42	0	C
	Underwater Grasses	22	-3	D-
	Resource Lands	33	0	D+
FISHERIES	Rockfish	49	-17	C+
	Oysters	12	+2	F
	Blue Crabs	60	+5	B+
	Shad	7	-3	F

Figure 1: The 2020 State of the Bay Report Card.

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# Commanders' Corner: Developing Installation-Specific Water Quality Strategies to Achieve the Fill Gap Strategy

By Stephanie MacDurmon, Brown and Caldwell

Through Executive Order 13508, DoD is committed to restore the health of the Chesapeake Bay, including improving water quality. This restoration effort, which is led by the U.S. Environmental Protection Agency, is coordinated primarily through the seven Chesapeake Bay watershed states or jurisdictions. The jurisdictions' Watershed Implementation Plans (WIPs) describe how each state will achieve the watershed's pollution diet, the Chesapeake Bay TMDL. In the 2019 Phase III WIPs, some jurisdictions call for DoD to continue to reduce the amount of total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) discharged to the Chesapeake Bay from military lands. The numeric targets that DoD, along with other federal agencies, is asked to achieve by 2025 for the Chesapeake Bay TMDL are referred to as federal planning goals (FPGs).

One way to reduce the amount of pollution in stormwater is by implementing best management practices (BMPs) that reduce or remove pollutants. However, some types of BMPs remove pollutants more efficiently than others. To understand the level of effort necessary for DoD to achieve its FPGs, the DoD CBP looked to the Chesapeake Assessment Scenario Tool (CAST), a web-based tool that models changes in pollutant loads (measured in pounds per year) that result from the implementation of stormwater BMPs. In CAST, the DoD CBP created a "Fill Gap" scenario that uses strategic BMPs selected by the DoD CBP to determine how much additional BMP implementation (measured in feet restored, acres treated, etc.) is needed. As shown in Figure 1, the implementation in the Fill Gap scenario is above and beyond what has been reported as completed or planned to date by installations to date. These strategic BMPs—stream restoration, street sweeping, tree planting, urban nutrient management plans, and runoff reduction practices—were chosen because they are cost-effective, require less "new" dedicated land, and provide greater removal of TN than other BMP types.

To help individual installations understand their share of the Fill Gap strategy, the DoD CBP used land use data and BMP records reported by the installations to estimate how much of each BMP an installation would need to implement to cumulatively achieve their jurisdiction's FPG. A spreadsheet with this information was released to installations through the Chesapeake Bay Action Team (CBAT) in December 2020. Since then, the DoD has released additional materials and resources and provided training to help installations interpret their Fill Gap BMP implementation and take greater control in planning and tracking BMP implementation.

## Resources to Interpret the Fill Gap Strategy

Some installations have indicated that the BMP types included in the Fill Gap strategy are not feasible or appropriate for their installation. When that is the case, the DoD CBP recommends that installations use the training provided to convert the infeasible BMPs to the equivalent pollution load reduction and identify alternative BMPs to achieve the same or greater reduction in TN, TP, and TSS. This can be done using CAST or through manual calculations. The January 2021 CBAT meeting included two presentations to train installation staff how to use CAST. The agenda included a general overview of the tool and detailed information about how to build installation-specific scenarios to interpret the Fill Gap strategy. A recent DoD fact sheet described how to manually calculate the pollutant load reductions.

## Installation Chesapeake Bay Program Status Reports

As discussed in the last Commanders' Corner, the pilot status reports document an installation's contribution to restoration efforts in the Chesapeake Bay watershed. One element of the report details the implementation of Fill Gap BMPs. This section includes the historical and planned implementation of each Fill Gap BMP type and identifies how much excess or additional implementation effort is needed to meet the installation's Fill Gap goal. Training provided to installations showed how BMP implementation in excess of the stated Fill Gap target can be used to offset deficiencies in other BMP implementation levels in pursuit of the overall pollution reduction goal.

## Takeaways for Commanding Officers/Commanders

These resources are intended to empower installation staff to manage planning efforts and focus resources related to the Chesapeake Bay TMDL and to ensure DoD achieves its FPGs. Commanding Officers/Commanders are encouraged to ask or engage with their environmental staff about their plans to achieve installation-specific pollution reduction targets to ensure jurisdiction FPGs are met by 31 December 2025.

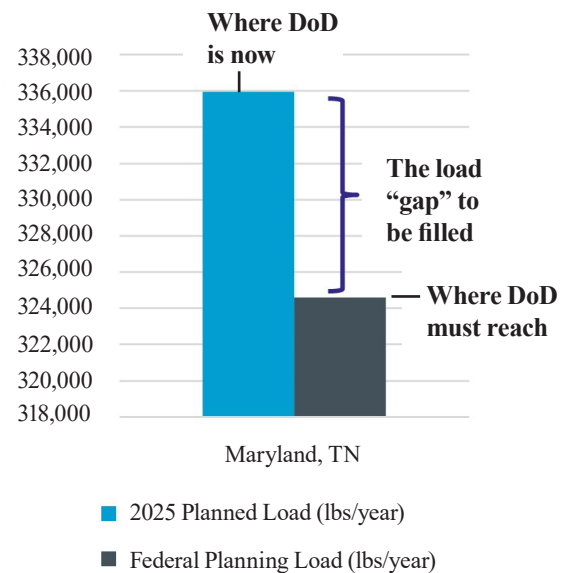


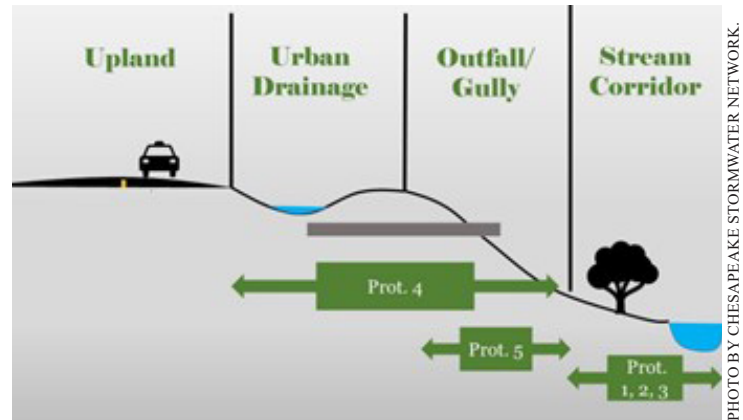
Figure 1: This graph demonstrates the difference (i.e., the "gap") in TN loads between DoD's 2025 planned load and its FPG in Maryland.



# Updated Guidance to the Prevented Sediment Protocol

By Gabrielle Bryson, Brown and Caldwell

Stream restoration is a strategic BMP to reduce TN, TP, and TSS loads, while limiting the need for additional mission-critical land. This type of BMP can also provide ecosystem services associated with wildlife and habitat restoration, as well as flood resilience. Together, these co-benefits are reasons why the DoD CBP selected stream restoration as part of their Fill Gap strategy to help attain its FPGs. In 2013, the Chesapeake Bay Program Partnership (Partnership) Urban Stormwater Workgroup outlined four protocols to define the pollutant load reductions associated with urban stream restoration projects. The Prevented Sediment Protocol (Protocol 1) is the most widely used protocol to calculate the Chesapeake Bay TMDL credit for stream restoration projects in small streams with perennial flow.



This graphic shows the applicability of the four original stream restoration protocols, as well as the recently added Protocol 5, within a stream corridor.

In August 2020, the Partnership’s Urban Stormwater Workgroup released a memorandum (memo) with revised guidance for Protocol 1. The updates provide additional guidance and clarification to data collection, calculations, modeling, and monitoring methods. These updates provide the potential to increase a project’s TMDL credit relative to the original Protocol 1 but may also increase design and construction costs. With an effective date of 1 July 2021, it is important for installations to understand the changes and how they will impact future projects.

## Summary of Protocol 1 Definitions and Clarifications:

The updated protocol includes new definitions and clarifications relevant to the application of Protocol 1, as follows:

**Legacy Sediment Removal or Stream Valley Restoration.** Sediments that are stored in the landscape as a result of historical accelerated upstream erosion are defined as “legacy sediments”. Stream valley restoration and legacy sediment removal refer to approaches aimed at restoring natural systems through removal of sediment deposits and the reconnection of the historical floodplain. More information about legacy sediment removal can be found in the “Getting the Dirt on Legacy Sediment” presentation from the April 2019 CBAT meeting on the CBP DENIX website (<https://authoring.denix.osd.mil/chesapeake/dod-cbp-chesapeake-bay-action-team-cbat/cbat-meeting-minutes/2019-cbat-meeting-minutes/cbat-meeting-presentations-april-2019/>). The memo proposes that a separate panel be convened to determine whether a separate protocol for legacy sediment removal is warranted.

**Bank Armoring.** The term “bank armoring” is defined under the revised guidance as the use of hard structures along the channel to limit horizontal movement of the stream bank. Bank armoring methods are now separated into three tiers of credit outlined in the table below. Images of these practices can be found on page 14 of the memo (linked at the end of the article.)

## Current Communications

Tier	Non-Creditable	Creditable with Limits	Creditable
<b>Definition</b>	Hard, permanent structures	Large rock or boulder structures	Structures that mimic naturally occurring streambank materials
<b>Examples</b>	Concrete retaining walls, gabions, engineered block walls, dumped rip rap, etc.	Localized stone toe protection, boulder revetments, imbricated (overlapping) rip rap, etc.	Root wad revetments, riffle-weir systems, berm-pool cascades, live stakes/coir logs, etc.
<b>Suggested Extent of Use</b>	Only to protect critical infrastructure	Up to 30% of the total bank length (only in areas of high shear stress)*	No limitations
<b>Credit Assigned</b>	None	Any use over 30% of the length is proportionally subtracted from the final pollutant load reductions	Full credit

\*Example: A stream restoration with 1,000 linear feet (lf) of restored banks includes 400 lf of boulder revetments. This exceeds 30% limit by 10%. Therefore, if a project earned 200 pounds of pollution reduction using Protocol 1, only 180 pounds may be claimed.



PHOTO BY CHESAPEAKE STORMWATER NETWORK.

**Qualifying Criteria.** In addition to the qualifying criteria outlined in the original protocol, the updated memo states that Protocol 1 may not be combined with recently released Protocol 5 (Outfall and Gully Stabilization) within the same project reach. A description of Protocol 5 was included in a past DoD fact sheet, which can also be found on the DoD CBP DENIX website: <https://authoring.denix.osd.mil/chesapeake/dod-cbp-chesapeake-bay-action-team-cbat/training-and-guidance-documents/fact-sheets/outfall-and-gully-stabilization-relationship-to-stream-restoration-credit/>.

### Adjustments to Calculating Prevented Sediment Credit

The updated protocol follows the existing three-step process for computing prevented sediment mass reduction credit, but revisions include clarifications on the data collection methods, assumptions, and calculations, as outlined below.

**Step 1: Estimating the Stream Sediment Erosion Rate.** The most common technique to estimate the bank erosion rate is the Bank Assessment for Non-point Source Consequences of Sediment (BANCS) method, which uses published standard bank erosion curves to estimate the annual rate of streambank retreat. The two most frequently used curves (Hickey Run in Washington, D.C., and North Carolina) were developed from limited datasets collected from a small number of representative reaches. In the revised guidance, if using the BANCS assessment method, practitioners are referred to Appendix C of the memo to estimate the erosion rate (tons/year/ft) based on values attained from on-site sampling (i.e., bulk density and nutrient concentration). There are also alternative methods for establishing the erosion rate, including the use of bank pins or cross section surveys. The stream sediment erosion rate is combined with soil bulk density and the bank area to calculate the sediment load. ***Determining soil bulk density value should rely exclusively on collection and direct analysis of site-specific samples, which must be collected from the site's pre-restoration conditions.***

**Step 2: Convert Streambank Erosion to Nutrient Loading.** ***TN and TP concentrations in stream banks are to be derived from site-specific sample collection and analysis.*** Nutrient loading rates are estimated by the multiplication of the prevented sediment loading rates (determined in Step 1) with average TN and TP concentrations.

**Step 3: Estimate Stream Restoration Efficiency.** No restoration project is 100% effective. Therefore, efficiency estimates are necessary to adjust the calculated nutrient loadings to reflect the pollutant reductions. Evaluating efficiency factors for stream restoration projects is accomplished through monitoring the difference between pre- and post-construction channel erosion. A few examples of approved monitoring methods include Bank Pin Monitoring, Digital Elevation Model (DEM) Differencing, and the BANCS assessment. Post-restoration monitoring should be conducted for a minimum of 3 years following project completion. The method used for post-construction monitoring should match the method used for the existing conditions assessment.

### Moving Forward with the New Requirements

While key updates to Protocol 1 are summarized above, the memo provides detailed descriptions of procedures, standards, and expectations for data collection and quality, site monitoring, and modeling. If a stream project is under consideration or currently in the planning phase, understanding these updates is critical. The new requirements take effect as of 1 July 2021; projects in the ground or under contract as of 1 January 2021 can utilize the original protocols. The authors of the revised guidance consider site-specific data to be critical to the accurate and consistent use of Protocol 1. However, default rates and soil series curves may be used to develop planning-stage estimates to screen projects.

While the new guidelines will increase the site-specific data collection and monitoring requirements before and after construction, the results will more accurately reflect the pollutant load reductions achieved by the stream restoration. In some cases, the calculated pollutant and sediment reductions will result in more TMDL credit than the project would have attained using the default rates. For installations, these changes will increase the total project cost, but also the project cost-effectiveness, reducing the number of additional BMPs necessary on site to meet TMDL goals. It is important for DoD installations to take the opportunity to review these changes prior to the effective date to ensure accurate calculation and reporting of TMDL credit for stream restoration projects, prior to the new Protocol 1 implementation. For full guidance on TMDL credit assessments, qualifying criteria, and suggested modeling and monitoring methods, please refer to the full memo: [https://chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2020/03/PROTOCOL-1-MEMO\\_WQGIT-Approved\\_revised-2.27.20\\_clean\\_w-appendices.pdf](https://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2020/03/PROTOCOL-1-MEMO_WQGIT-Approved_revised-2.27.20_clean_w-appendices.pdf)



Water Quality Monitoring at Austin Run in Stafford County, Virginia.

PHOTO BY CBP.



# Considerations for Use of Protocol 1 for Stream Restoration

The following are considerations to streamline implementation of Protocol 1 requirements (effective July 1, 2021).



## Planning Stage

- Conduct a comprehensive or stream restoration-specific “BMP Opportunity Assessment”
- Stormwater practitioners may use current default rates to develop planning level TMDL credit estimates to screen proposed project locations to meet pollutant reduction requirements.
- To prioritize stream restoration candidates, installations should:
  - Identify potential stream restoration reaches and coordinate with installation natural resources and climate resilience staff to identify projects that will meet multiple installation goals and objectives.
  - Prioritize landscape position and establish projects closest to unimpaired stream headwaters.

For top stream restoration candidates (meeting collective goals), collect reach-specific bulk density sampling, conduct nutrient loading assessments, and assess stream erosion efficiency to refine TMDL credit amounts and cost/benefit analyses. If not possible in the planning stage, conduct this activity in the project design stage.



## Project Design

- The project must be at least 100 linear feet and must address long-term stability of the channel, banks, and floodplain.
- If bank armoring is to be utilized, determine if it is creditable, creditable with limits, or non-creditable and how that may impact nutrient and sediment reductions.
- Ensure the project scope includes existing condition site sampling, monitoring, and analysis to determine the bank erosion rate and the site’s TN and TP concentrations prior to construction (if not conducted as part of the planning stage). The project scope should also include the required post-construction monitoring, which is described below.



## Post Construction

- Projects must have a post-construction maintenance & monitoring program.
- To obtain a restoration efficiency greater than 50%, the following requirements must be followed:
  - Measure the pre- and post-restoration sediment loss with the same monitoring method.
  - Conduct three years of post-restoration monitoring before re-calculating the project’s reduction efficiency.
- Monitoring methods can include DEM differencing, bank pin monitoring, bank profile measurements, or the BANCS assessment.



# Monitoring Urban Wildlife at Arlington National Cemetery

By Gabrielle Bryson, Brown and Caldwell, with input from Stacey Rosenquist, Arlington National Cemetery (ANC), and Merri Collins, George Mason University

ANC has partnered with Dr. Travis Gallo at George Mason University (GMU) as a part of an urban wildlife monitoring program around the Washington, D.C. metropolitan area. This GMU project monitors and collects data on urban wildlife species in cities and their surrounding areas. Understanding animal distributions, populations, and community dynamics in and around urban areas is imperative to developing management plans that mitigate conflicts between humans and wildlife. The goals of this study align with the management objectives of DoD installations that prioritize projects that preserve the cemetery's condition, honor its purpose, and protect natural resources.

From October to November of 2020, a motion-sensor camera filmed wildlife in natural areas near the Millennium Stream at ANC. The camera recorded images of four species of mammals and six species of birds. Most of the animals captured on film were small species, along with white-tailed deer. ANC staff speculate that a nearby security fence along the installation's shared boundary with Joint Base Myer-Henderson Hall may limit the passage of larger mammals through the area. ANC will continue to participate in the study, which is expected to be a multi-year monitoring effort. A second observation period was conducted in the same area in February and March. A third observation period is scheduled to occur between April and May 2021.

Partnerships like this one between DoD and academic institutions can yield valuable data for both parties. ANC has allocated funding to develop an Integrated Natural Resource Management Plan (INRMP) for the installation. The results of this study, as well as other surveys and data collection efforts, can inform the selection and implementation of projects to protect natural resources and promote the health and diversity of the wildlife species while also minimizing impacts to the mission as required by the Sikes Act.

The GMU project is a part of larger network of similar studies in urban areas across the country. The compiled data from the network will be used to understand and analyze animal behavior to inform the efforts of planners and wildlife managers to protect biodiversity in and around cities. For more information about this urban wildlife-monitoring program, visit the Urban Wildlife Information Network website (<https://urbanwildlifeinfo.org>) for access to the network's complete database.



ANC is located in the Washington, D.C. metropolitan area.

PHOTO BY ELIZABETH FRASER, ANC.

## Unexpected Sightings of Flying Squirrels

While flying squirrels are not a rare sight in this region, these animals are not often on the ground. Flying squirrels typically nest in trees during winter months but may occasionally seek food on the ground, especially during autumn when nuts fall from the trees. Areas of continuous tree canopy are found throughout ANC, providing a safe habitat for this species.

Since flying squirrels are nocturnal, humans seldom see these animals. The squirrel pictured here was detected by the camera for several nights during the fall 2020 wildlife monitoring period at ANC.



PHOTO BY MERRI COLLINS, GMU.



# Managing Phragmites to Support Mission Sustainment and Natural Resources in a Changing Climate

By Alicia Garcia, Joint Base Langley-Eustis (JBLE)-Langley

JBLE-Langley is located in coastal Virginia and is bounded by the Back River, a saltwater tributary to the Chesapeake Bay. The waters of the Back River nurture extensive tidal wetlands that provide fish habitat for more than 14 economically important species. Unfortunately, risks of sea level rise are higher in the Hampton Roads region area of Virginia where JBLE-Langley is located than any other location along the U.S. East coast (Tompkins and DeConcini, 2014).

The persistence of tidal wetlands at the installation is at particular risk due to the compounding effects of sea level rise, ground subsidence, and land development barriers to landward migration. Rising tidal waters and the landward extent of tidal flooding is moving coastal ecosystems inland, creating new plant transition zones and opportunities for colonization by invasive species.

## Threats from Phragmites

*Phragmites australis* (commonly known as phragmites), is an invasive perennial grass that can rapidly occupy and outcompete native plants and wildlife habitat in disturbed wetlands, uplands, and landscape transition zones. The rapid pace of the changing environment often limits the ability of native marsh plants to compete with invading phragmites before they can become established. Phragmites may cause the loss of nesting habitat for some wildlife, threatening species of concern like the diamondback terrapin (*Malaclemys terrapin*).

The valuable maritime forest ecosystem surrounding JBLE-Langley is succumbing to saltwater intrusion, and the installation's diverse assemblage of native upland plants is being replaced primarily by invasive phragmites.

While primarily known as a wetland invader, phragmites also frequently colonizes disturbed uplands. At JBLE-Langley, growth in upland areas has threatened the installation's airfield and air operations. Phragmites often grows in thick stands up to nine feet tall and can provide cover for deer, coyotes, and birds near the airfield, which heightens the potential for bird airstrike and wildlife collision safety hazards. Dead standing and accumulated dry plant material also poses a fire and smoke hazard that may threaten air operations.

## Overlapping Mission Sustainment and Environmental Resilience

A primary goal of natural resources management on DoD lands is to facilitate military readiness through the sustained capacity for use of natural resources. DoD Instruction 4751.3 on Natural Resources Conservation Programs states that a multispecies management strategy that promotes biodiversity should be taken when possible. Efforts to control phragmites align with the goals of DoD Instruction 4751.3, as well the Sikes Act and the following goals of Executive Order 13508: Recover Habitat, Sustain Fish and Wildlife, and Climate Resilience.

Because of its potential impact on JBLE-Langley's mission and its far-reaching consequences for its natural resources, management of phragmites was deemed a priority. Since 2016, the Air Force has spent over \$400,000 in an effort to remove phragmites from sensitive areas.



JBLE-Langley is bordered by the Back River, which features extensive tidal wetlands. Map generated in Google Earth.



Phragmites australis patch in JBLE-Langley.

PHOTO BY ALICIA GARCIA, JBLE-LANGLEY.



## Developing a Prioritized Management Strategy

Unfortunately, efforts to date have not treated all the phragmites on the installation each year. During the first year of treatment in 2016, all known areas infested with phragmites were successfully treated through the application of the herbicide Imazapyr. In subsequent years, available funding was not sufficient for treatment of all locations where the plant was still found. To maximize the ecosystem benefits from these limited resources, a plan was needed to prioritize control efforts for phragmites on the installation.

Current areas of treatment were selected based on several factors supported both by peer-reviewed literature and personnel knowledge of the JBLE-Langley mission and landscape. The installation's top priority was to treat recently colonized areas of phragmites near the airfield to protect both the flight mission and wildlife.



*An area of mesohaline marsh on JBLE-Langley unaffected by phragmites.*

PHOTO BY ALICIA GARCIA, JBLE-LANGLEY.

The next priority was to preserve the potential for landward marsh migration and the persistence of native plant diversity in light of tidal flooding and saltwater intrusion. Treatments in marsh areas were prioritized based on the following criteria:

- Areas slated for shoreline restoration where phragmites might disrupt efforts to colonize wetlands with native vegetation
- Areas recently invaded by phragmites where treatment has a higher chance of success
- Areas known to be used for reproduction by species of concern, especially those threatened by climate change
- Areas further away from untreated areas, since adjacent untreated stands allow for rapid re-colonization

These developed priority levels for future treatment areas were strongly informed by the review paper written by Hazelton et al. (2014), summarizing 40 years of lessons learned from battling invasive phragmites.

## Outcomes and Future Management Considerations

Removal of invasive species, such as phragmites, from maritime forest and high marsh areas provides space and opportunity for marsh retreat, potentially ensuring the persistence of many wildlife species that rely on native plant habitats. After three consecutive years of treating phragmites on JBLE-Langley, no mature stands of phragmites are present near the installation's airfield, supporting flight safety and protecting wildlife. In high marsh areas where treatment efforts have been focused, monospecific stands of phragmites now struggle and the wetlands are beginning to be recolonized by native species. However, total eradication of plant pests may not always be a reasonable goal given the reality of finite resources and the impressive resilience of certain invasive species to treatment. For coastal installations dealing with threats to mission sustainment and the natural resource benefits of marsh communities from both sea level rise and phragmites encroachment, an evidence-based approach to guide invasive species management must be considered when allocating limited resources to support the military mission, protect important marsh communities, and preserve biodiversity.

## References:

Hazelton, E. et al. (2014). Phragmites australis management in the United States: 40 years of methods and outcomes. *AoB PLANTS*, 6(0), plu001. <https://doi.org/10.1093/aobpla/plu001>

Tompkins, F and Deconcini, C. (2014) *Sea Level Rise and its Impacts on Virginia*. World Resources Institute.





# Proposed Sentinel Landscapes in Virginia

By Terry Lasher, Virginia Department of Forestry (VDOF)

In 2013, DoD, the Department of Agriculture, and the Department of the Interior founded the Sentinel Landscapes Partnership — a coalition of federal agencies, state and local governments, and non-governmental organizations that partner with private landowners to prevent mission impacts while promoting sustainable land uses around DoD installations. Currently, there are seven Sentinel Landscapes across the country (Florida, Georgia, Arizona, Minnesota, Washington, Maryland, and North Carolina). As of 27 January 2021, the seven landscapes have protected approximately 467,000 acres of land. They have also promoted the implementation of sustainable management practices around high value testing and training facilities and installations on an additional 2.3 million acres of land ([www.sentinellandscapes.org](http://www.sentinellandscapes.org)). Recently, a coalition of federal, state, and DoD partners have proposed designating a new large “Virginia Security Corridor” Sentinel Landscape.

## Advancing the Shared Goals of DoD and the Commonwealth of Virginia

DoD plays a vital role in the Commonwealth’s economy with a total economic impact of \$104 billion. DoD also supports more than 885,000 jobs in the state, and the military accounts for 44% of all federal spending in Virginia.

DoD is also a critical partner in the state’s environmental health. This relationship is highlighted by a mutual interest in issues, such as climate resilience and the protection and enhancement of water quality and natural resources. Balancing these critical concerns collaboratively and with a holistic approach is mutually beneficial. We also understand that the environment functions more efficiently and effectively when managed at the landscape level. Such an approach takes coordination, funding, and a sense of shared interest, all of which a Sentinel Landscapes delivers.

The designation of a Virginia Sentinel Landscape would increase collaboration and partnership across many different interests toward a set of shared goals: to enhance military readiness and to benefit the environment, wildlife, outdoor recreation, working lands, and the local economy. For DoD, the landscape designation would protect and expand its capacity to train and test equipment for national security. For example, projects and programs that conserve open and forested land ensure that land-based and airspace training can continue. These types of projects also build local resilience to natural hazards and reduce or eliminate impacts of incompatible development to DoD installations. For other partners, the designation would bring investment dollars to programs that help landowners and localities manage their resources while reducing incompatible land use changes that negatively impact military readiness.

## Anticipated Approach to Securing a Sentinel Landscape Designation

Virginia’s Secretaries of Agriculture and Forestry, and Veterans and Defense Affairs, in partnership with DoD’s military installations, local governments, and non-governmental agencies, propose the designation of a Sentinel Landscape encompassing much of the eastern portion of the Commonwealth. This proposed plan utilizes one landscape designation with four subgroups or “anchors” (see map for landscape division). The “Virginia Security Corridor” Sentinel Landscape partners expect to explore regional compatible land use planning options to minimize encroachment and other factors that can affect the military’s ability to execute mission training and testing requirements at facilities in Virginia, including its air corridors.



PHOTO COURTESY OF MICHAEL JACKSON, LOCKHEED MARTIN.

Figure 1. More than 85% of Virginia airspace is used for military training.

**Virginia’s proposed corridor brings together four very important needs: military readiness, execution of joint land use study action items, working forest and agricultural lands retention, and the nationally significant goal of restoring the Chesapeake Bay.**



Expanding the Sentinel Landscape Partnership in Virginia would bridge the gap between existing Sentinel Landscapes in Maryland and North Carolina (Figure 2). Virginia's proposed Security Corridor Sentinel Landscape would therefore create a large scale, multi-partner training and environmental network in the Mid-Atlantic. In the context of DoD's commitment to restore the Chesapeake Bay watershed, the Corridor may also provide opportunities for increased collaboration in efforts to protect both natural landscapes and military sustainment.

### Anchor Installations

Unlike other Sentinel Landscapes, the Virginia Security Corridor proposes to designate four anchor installations: Marine Corps Base Quantico, Fort A.P. Hill, Joint Base Langley Eustis, and Fort Pickett (Figure 2). This approach would allow the Sentinel Landscape to focus on large landscape restoration and management while delivering locally managed programs and representing local conservation needs and goals.

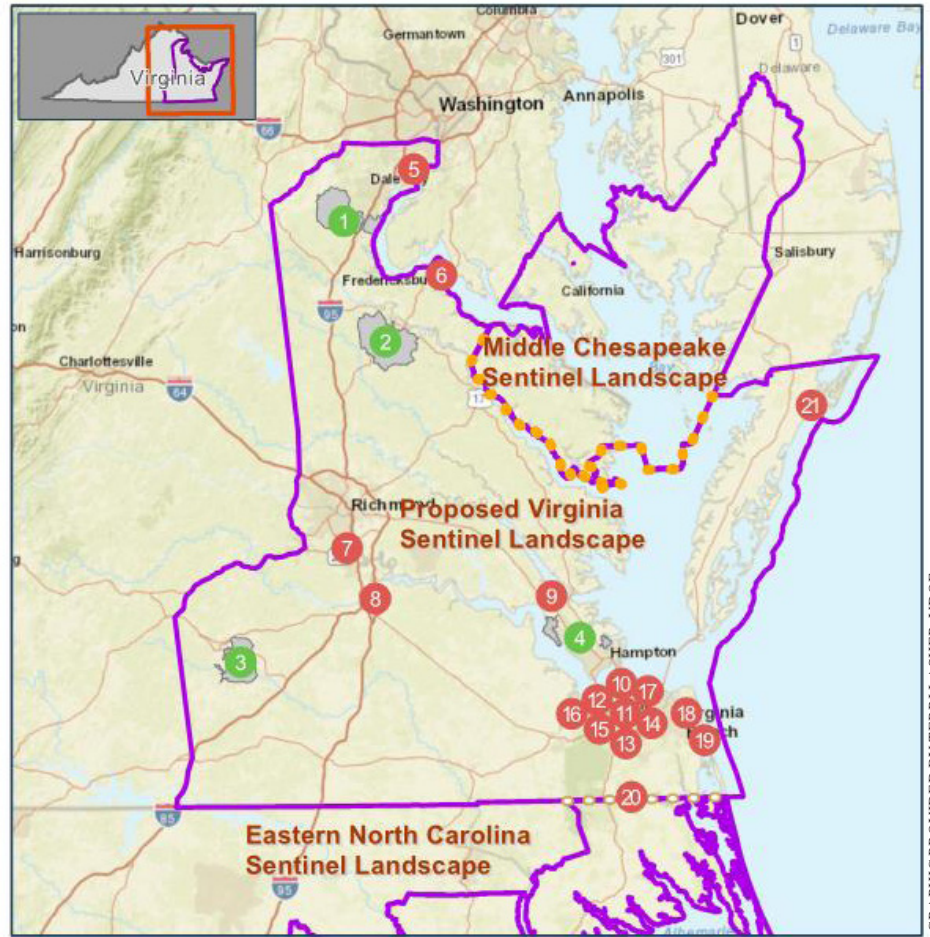
While each sub-landscape will be responsible for identifying specific initiatives, they all share five established objectives:

- Strengthen military readiness through compatible land use
- Retain working forests and agricultural land
- Protect high conservation value land
- Meet statewide water quality goals and support the goals of the state coastal resiliency master plan
- Stimulate rural economic development

While it may seem ambitious to identify four anchor installations, the proposed approach reflects the diverse missions and concerns of military installations in Virginia. The Corridor partners have determined that dividing the landscape among the anchors is critical to the success of the proposed partnership.

### Next Steps

The designation of the Virginia Security Corridor Sentinel Landscape would unite four essential needs of the DoD and its partners: military readiness, execution of joint land use study action items, working forest and agricultural lands conservation, and restoration of the Chesapeake Bay. The partners should receive notice from the Sentinel Landscape Partnership in June to indicate if they will be asked to submit a full proposal for the designation. If so, the final proposal will be submitted in August.



GRAPHIC PROVIDED BY TERRI LASHER, VDOF.

### Virginia Security Corridor

● Anchor Installation	5 Fort Belvoir	14 Norfolk Naval Shipyard
● Supported Installation	6 Naval Support Facility Dahlgren	15 Naval Medical Center Portsmouth
● Shared Border with Middle Chesapeake Sentinel Landscape	7 Defense General Supply Center Richmond	16 USCG Base Portsmouth
● Shared Border with Eastern North Carolina Sentinel Landscape	8 Fort Lee	17 Joint Expeditionary Base Little Creek-Fort Story
1 Marine Corps Base Quantico	9 Naval Weapons Station Yorktown	18 Naval Air Station
2 Fort A. P. Hill	10 Naval Station Norfolk	19 Dam Neck Annex
3 Fort Pickett	11 Norfolk District U.S. Army Corps of Engineers	20 NSA Northwest Annex
4 Joint Base Langley-Eustis	12 Naval Support Activity Hampton	21 Surface Combat Systems Center Wallops Island
	13 Coast Guard Atlantic Area & Fifth Coast Guard District	

Figure 2. Proposed sub-landscapes and anchors of the Virginia Security Corridor Sentinel Landscape.

# Chesapeake Bay Action Team Updates

By Heather Benson, Brown and Caldwell

Members of the CBAT convened for their quarterly meeting on 21 January 2021. Members reviewed ongoing Chesapeake Bay-related service and installation projects and activities and listened to two presentations about CAST.

## Chesapeake Bay Service Leads and Installation Updates

- Mitch Keiler (Fort Meade) requested data and cost information on stream restoration projects from other DoD installations. Those with information should contact him and Maribeth Gravunder.
- Proposed improvements to Maryland's In-Lieu Fee Wetland Mitigation Program were discussed at the Maryland Partnership Meeting on 20 January 2021. If there is interest to hold a discussion on the proposed changes, contact Kevin Du Bois. Questions or comments for the Maryland Department of the Environment can be directed to Sharon Baumann.
- Todd Beser (Aberdeen Proving Ground) suggested the creation of a Readiness and Environmental Protection Integration workgroup to coordinate efforts to conserve land in the watershed. Installation staff interested in participating can contact Todd Beser or Kevin Du Bois.

## Presentation 1: TMDL Planning with CAST for DoD Installations

Stephanie MacDurmon described how installations can use BMP data with CAST to plan for pollutant load reductions related to the Chesapeake Bay TMDL through 2025. The presentation highlighted how to build four scenarios with information from the BMP data call: a 2020 Progress scenario, a 2025 Planned scenario, an installation Fill Gap scenario, and a custom Fill Gap with BMP types selected by the installation. She described how the scenario results can be used to determine the load reductions associated with the installation-specific Fill Gap strategy provided to installations in December 2020.

## Presentation 2: CAST Demonstration

Olivia Devereux provided a live demonstration on how to use CAST, including how to view the results of existing and user-built scenarios, how to compare scenarios, and how to find tools and resources to assist federal facilities to understand and utilize CAST as a part of their CBP initiatives. The CAST webpage includes free training videos (<https://cast.chesapeakebay.net/Learning/FreeTrainingVideos>), as well as a guidance document written for federal facilities ([https://cast.chesapeakebay.net/FileBrowser/GetFile?fileName=CASTHowToGuideFederal\\_11.8.18.pdf](https://cast.chesapeakebay.net/FileBrowser/GetFile?fileName=CASTHowToGuideFederal_11.8.18.pdf)).

## DoD Chesapeake Bay Program Updates

- A recording of the meeting and a copy of the presentations has been posted to the DoD CBP DENIX website at this link: <https://authoring.denix.osd.mil/chesapeake/dod-cbp-chesapeake-bay-action-team-cbat/training-and-guidance-documents/>
- The DoD CBP Winter Journal was mailed on 15 January and posted to the DoD CBP DENIX website the week of 21 January.
- The DoD CBP accepted draft articles for the DoD CBP Spring Journal through 5 February.
- The DoD CBP accepted high-resolution photos for the Annual Progress Report cover through 31 January.
- A fact sheet describing how to convert BMP implementation in the Fill Gap strategy to load reductions was released to the CBAT and posted to the DoD CBP DENIX website in February.
- The Chesapeake Stormwater Network accepted BUBBA (Best Urban BMPs in the Bay Award) nominations through 5 February. The winners will be announced in March.
- Completion of the first pilot report for the DoD CBP Installation Status Reports (Naval Support Activity Hampton Roads) is imminent.
- The DoD CBP has requested information on projects to be highlighted in the Annual Progress Report.
- The Interim Water Quality Programmatic Milestone Assessment provided to the Environmental Protection Agency showed two milestones where more progress can be made: Agricultural leased lands with the potential for adding TMDL creditable BMPs and assistance to installations to identify INRMP projects with water quality co-benefits.

The next CBAT meeting is scheduled for 29 April 2021.



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## ✓ Check it Out

**Enactment of Historic Legislation is Major Victory for Chesapeake Bay**, CBF press release, published 30 October 2020. This passage outlines the new authorization and funding for Chesapeake Bay restoration in the recently enacted America's Conservation Enhancement Act. <https://www.cbf.org/news-media/newsroom/2020/federal/enactment-of-historic-legislation-is-major-victory-for-chesapeake-bay.html>

**Stream Restoration Crediting to Meet Municipal Separate Storm Sewer System and TMDL Webinar**, KCI Innovator Webinar Series, recorded on 18 December 2020 <http://s.bl-l.com/h/dbML5Rxc?url=https://www.kci.com/resources-insights/innovator/stream-restoration-crediting-to-meet-ms4-and-tmdl-requirements-webinar/>

**Protecting our Nation's Sacred Symbol, JBLE Public Affairs**, published 20 January 2021. This article highlights JBLE's eagle protection project. <https://www.dvidshub.net/news/387249/protecting-our-nations-sacred-symbol>

**Nutrient Trends and Drivers in the Chesapeake Bay Watershed**, United States Geological Survey Fact Sheet, published January 2021. <https://pubs.usgs.gov/fs/2020/3069/fs20203069.pdf>

**Innovative Approaches to Monitor and Survey At-Risk Species on DoD Lands**, Strategic Environmental Research and Development and Environmental Security Technology Certification Program webinar, 22 April 2021, 12:00 p.m. <https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series>

**CBAT Quarterly Conference Call and Meeting**, 29 April 2021, 10:00 am to 12:00 pm. EDT.

MS Teams Conference Call Phone Number: 571-388-3904;  
Conference ID 255 269 41#.

Contact Kevin Du Bois or Jessica Rodriguez to receive a meeting invitation with a web link.

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