



Chesapeake Bay Program
Science. Restoration. Partnership.

CENTER FOR
**WATERSHED
PROTECTION**

Maintaining Forests in Stream Corridor Restoration and Sharing Lessons Learned

JOINT STREAM HEALTH WORKGROUP/
FORESTRY WORKGROUP MEETING

6/7/2023



This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement CB96374201 to the Chesapeake Bay Trust. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

Project Overview

➤ **FUNDING & GOALS**

- Project funded by the Chesapeake Bay Trust to evaluate processes and protocols in the Chesapeake Bay watershed that minimize potential unintended adverse outcomes of stream restoration projects on the adjacent riparian area, including forest buffers and identify opportunities to minimize these adverse outcomes and improve riparian and stream habitat quality.
- Includes a comprehensive assessment of how forests are accounted for at multiple stages of stream restoration, including planning, permitting, implementation, and post restoration.



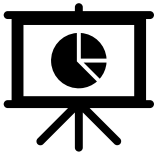
➤ **PARTNERS**

- Collaboration between the Center for Watershed Protection, Chesapeake Bay Program, and stakeholders.



➤ **GEOGRAPHY**

- Both urban and rural areas of PA, MD, and VA.



➤ **RESULTS**

- Results will help CBP partnership to improve the selection, permitting, and funding processes for stream restoration projects and provide guidance to local governments for best practices.

Project Overview



➤ Policy and Document Review



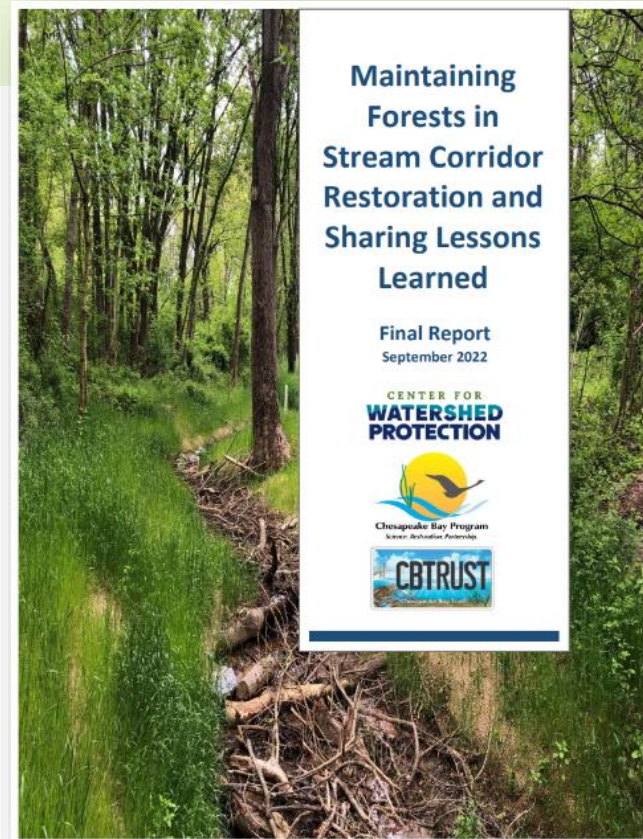
➤ Interviews



➤ Case Study Analysis

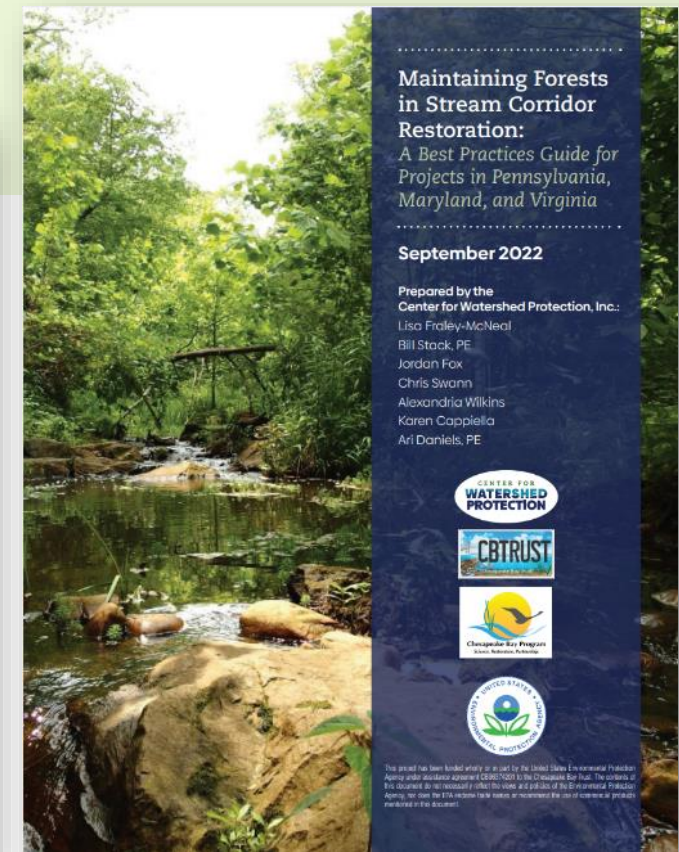


➤ State Webcasts



Final Report

<https://owl.cwp.org/mdocs-posts/maintaining-forests-in-stream-corridor-restoration-and-sharing-lessons-learned-final-report/>



Best Practices Guide

<https://owl.cwp.org/mdocs-posts/maintaining-forests-in-stream-corridor-restoration-a-best-practices-guide-for-projects-in-pennsylvania-maryland-and-virginia/>



Potential Riparian Impacts

- Loss of existing trees from direct removal during construction, compaction and root disturbance, and increased groundwater elevations/extended floodplain inundation.
- Years of ecosystem maturation may be needed before a project fully meets its long-term restoration objectives and realizes its full environmental benefits (Kaushal et al., 2021; Wood et al., 2021).
- Projects that involve extensive channel reconfiguration or remove existing riparian cover are likely to see less functional uplift, including nutrient removal, at least until the replanted areas achieve maturity (Orzetti et al., 2010).
- Stream temperature impacts - STAC Temperature Workshop: <https://www.chesapeake.org/stac/events/session-2-rising-watershed-and-bay-water-temperatures-e2-80-94ecological-implications-and-management-responses/>
- The CBP Stream Restoration Protocols include qualifying conditions and best practices that offer some protection for riparian vegetation if implemented, but they have not been consistently applied.
- Public criticism

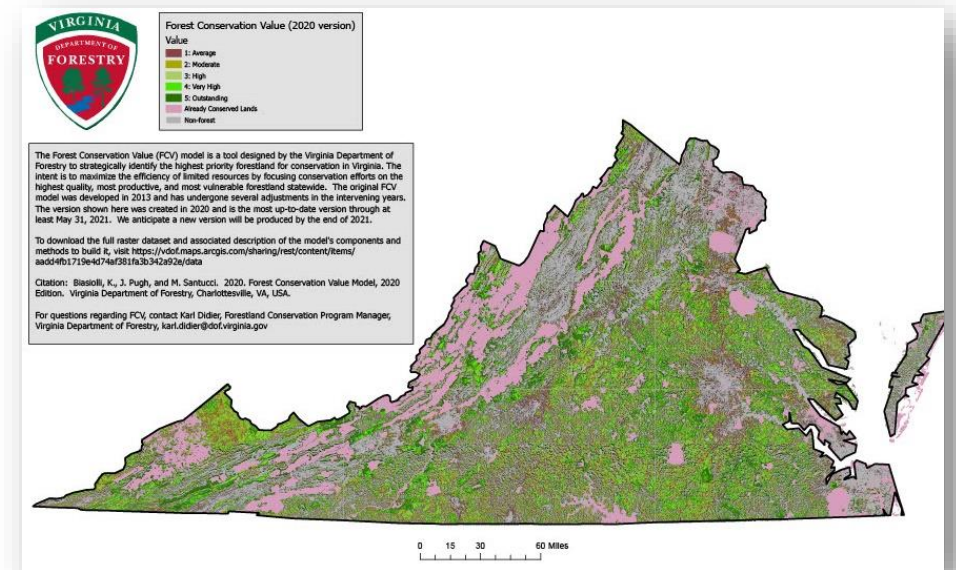
Site Selection

Proper site selection using a watershed-based approach is the most important best practice to target restoration to areas in need for restoration and prevent impacts to existing high-quality streams and riparian areas.

- Generally, sites are selected using one or a combination of:
 1. Opportunistic considerations
 2. Watershed assessments conducted as part of a watershed planning initiative
 3. Mitigation banking efforts

- Funding availability and landowner willingness drive site selection.

- Identified need for clear definitions of existing “high” and “low-quality” streams and riparian areas that need restoration and guidance from state regulatory agencies.

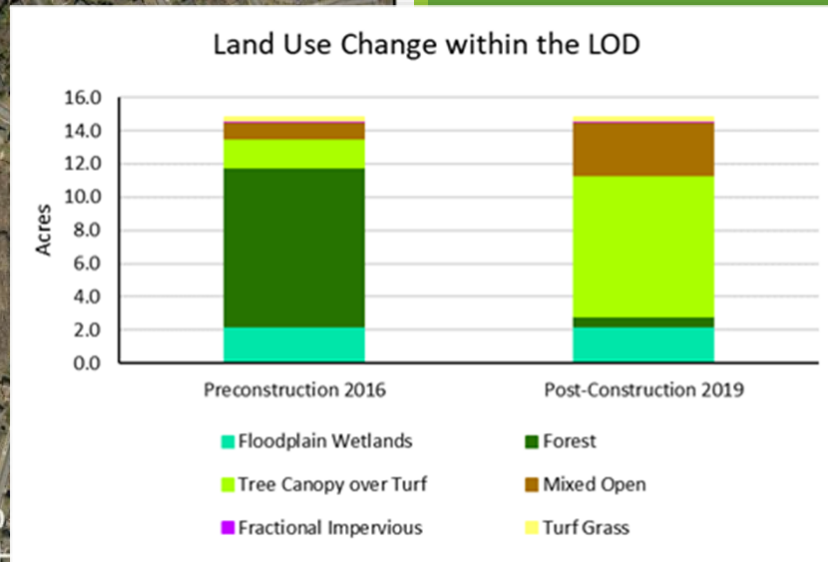
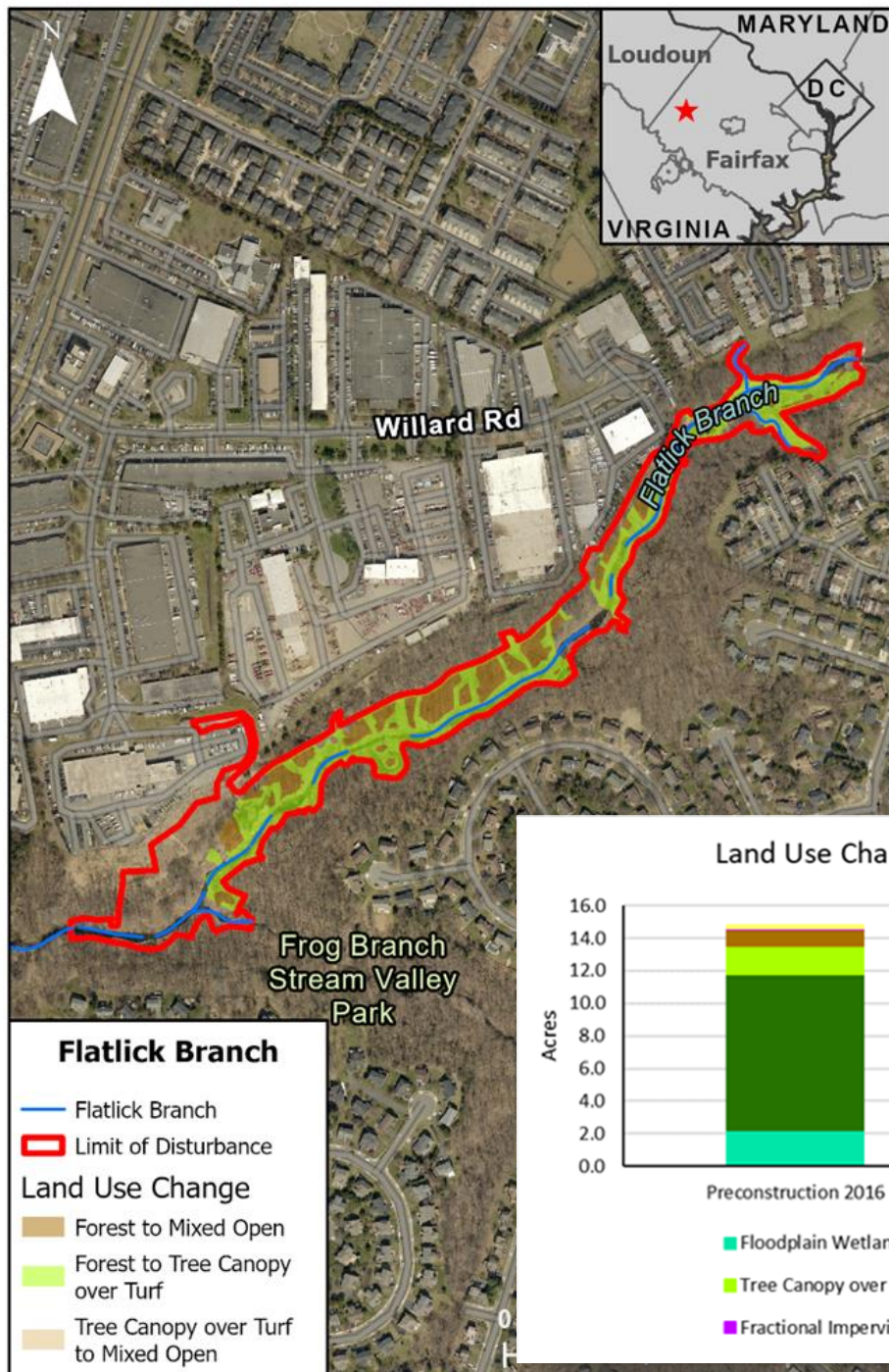


<https://www.dcr.virginia.gov/natural-heritage/vaconvisforest>

Establishing Goals and Objectives

- Stream restoration projects are commonly implemented with the goal of obtaining nutrient and sediment load reductions for TMDL credit only.
- The case study analysis found that the nutrient and sediment load reduction benefits of restoration significantly outweighed any increase in loads from riparian land use conversion within the context of the Chesapeake Bay Watershed Model land use and loading rate framework.

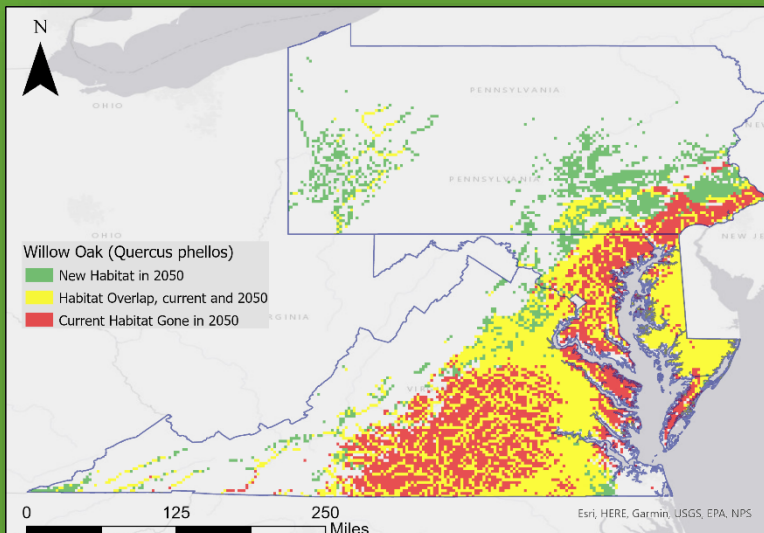
- Proposed stream restoration projects should be developed through a functional assessment process, such as the Stream Functions Pyramid.



Design and Permitting

Important best practices include pre-application meetings with federal and state permitting agencies and coordination with forest agencies.

Include assisted migration in planting plans to incorporate species adapted to changing climate conditions.



- The removal of entire buffers or mature trees is a value decision made by the municipality or other authorizing entities and was largely mentioned in association with legacy sediment removal, dam removal, and infrastructure protection projects.
- The types of forest agencies and their current level of involvement in the design and permitting process is highly variable among jurisdictions.
- In VA, the FEMA No-rise Certification has become a driver for stream restoration projects on larger streams to be designed following NCD Priority 2 that creates a new channel and lowers the floodplain in order to avoid requesting a CLOMR or variance to the requirements, resulting in a greater clearing footprint and hardened or armored restoration to provide stability.



Monitoring and Maintenance

- Most restoration projects undergo monitoring for 2 – 5 years after construction, based on required state and federal permit conditions. CBP stream restoration verification is also required for visual inspections once every 5 years. Typically focused on stream stability and not riparian ecosystems.
- Invasive species management compounded by climate change.
- Funding was frequently mentioned as a limiting factor for extensive post-construction monitoring, particularly for grant-funded projects.
- Recommendations include a pooled monitoring approach and for local governments and funding agencies to allow for a percentage of funds to be allocated for post-construction monitoring and maintenance and extend the allowable project period so that monitoring can occur over the long-term.

Q&A / Discussion

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