OPTIMIZING RIPARIAN FOREST BUFFER IMPLEMENTATION FOR CLIMATE ADAPTATION AND RESILIENCE

Information and guidance for government officials and practitioners

The impacts of climate change are already being felt throughout the Chesapeake Bay watershed. Air and water temperatures are increasing; precipitation is expected to increase overall; and species ranges are shifting northward. These changes, among others, are likely to drive increases in stormwater and flooding, threaten fish, wildlife, plant, and human life and result in changes in water supplies. This project synthesizes a wealth of information to support communities in building climate adaptation and resilience by implementing riparian forest buffers. The project provides information via:

- a synthesis report with two appendices: case studies and an annotated bibliography
- an interactive StoryMap and tutorial

Summaries of findings and strategies:

Threats to communities & benefits provided by RFBs	Optimizing the benefits of RFBs and supporting RFB resilience
Increased storm events and flooding. RFB benefits: • Reduce flood peak • Give more time to issue flood warnings • Mitigate increases in bank erosion	RFB siting considerations: • Upstream and downstream • Adjacent, upslope land uses • Intact, continuous corridors
Threats to fish, wildlife, and plant life. RFB benefits: • Moderate stream temperatures • Accommodate shifting species ranges • Provide resilience against invasive species, pests	RFB Design considerations: • Width • Species selection • Spacing and layout
Changes to water supplies. RFB benefits: • Mitigating increased nitrate in water supplies • Supporting surface and groundwater availability	Additional considerations: • Tradeoffs and co-benefits • Restoration in conjunction with long-term protection • Complementarity with other best management practices • Maintenance • Landowner priorities
Additional threats. RFB benefits: • Reduce nutrient inputs that cause algal blooms • Act as windbreaks to reduce soil erosion • Provide heat refugia and recreation opportunities	

The case studies included are examples of projects that demonstrate RFB benefits to mitigate threats and where project design or siting criteria maximize community and RFB resilience. Case studies represent the array of adaptation benefits and resiliency strategies described in the synthesis report. Seven case studies demonstrate that there are multiple strategies that communities can use to implement RFB policies and programs. All programs and designs should consider landscape and community context and incorporate projected changes to the landscape and climate to ensure RFB resilience.

Case studies	
Valuing ecosystem services	Maryland 5 Million Trees Initiative, MD
Community-based resilience	Resilience Forward, Resilience Authority of Charles Co., MD Middle Branch Resiliency Initiative, MD Climate Crew, Greater Baltimore Wilderness Coalition, MD CommuniTree Program, Cacapon Institute, WV
Data-driven decision-making	PA 30 by 30 Stream Delisting, PA Upper Susquehanna Coalition's Water Quality Program, NY and PA

Communities across the Chesapeake Bay watershed play a pivotal role in determining flooding impacts, ecosystem health, and the availability of surface and groundwater locally and downstream. Riparian buffers act as interconnected corridors along waterways, meaning their ecological and climate benefits extend beyond jurisdictional boundaries. When implemented and maintained strategically across the watershed, buffers contribute to the collective resilience of the entire Bay ecosystem.

Credit: Photo by Will Parson, Chesapeake Bay Program

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