SIERRA CLUB
MARYLAND CHAPTER

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Committee: Education, Energy and Environment

Bill Number: SB 688: Environment – Stream and Floodplain Restoration Projects – Requirements and Limitations

Position: Support

Hearing date: March 3, 2026

The Sierra Club Maryland Chapter supports SB 688, which would improve the way our State and counties manage stormwater in Maryland. We need to shift our focus from stream restoration projects that address only the symptoms of stormwater runoff and give priority to cost-effective projects that address the sources of stormwater flooding, pollution and erosion.

Stream restorations – reengineering of stream channels and floodplains – should be the last resort, not the first option. They are expensive, often remove hundreds of mature native trees, and disrupt ecosystems while frequently failing to solve the underlying problem – excess stormwater entering the streams from upland areas. Unfortunately, we have created systems that incentivize costly stream restorations, regardless of necessity, and local agencies have been slow to change. Administratively, it is easier to authorize a few big construction projects to earn pollution credits than to work with the public and developers to create many small interventions such as rain gardens, bioretention installations, bioswales, green roofs, and reductions of impervious surfaces.

This bill provides some much-needed guidance and accountability that requires the shift in priorities we need to address the root problem. It says that in-stream construction projects using heavy equipment cannot be used to earn MS4 credits, mitigation or other pollution control credits unless there are no feasible alternatives. "Infeasible" is defined as technically impracticable for physical reasons. An alternative cannot be ruled out on the basis of cost alone.

Fortunately there are many alternatives which can be more cost effective. A 2012 Baltimore case study estimated stream restoration at $500-$1,200 per foot, while bioretention ponds were "equivalent to $30-120 per foot of restored stream."[1] The Maryland Department of the Environment's 2022 Annual Report on Financial Assurance Plans shows that there are 18 different kinds of out-of-stream projects that can earn pollution credits and which are cheaper per acre restored than stream restorations,

[1] M. A. Kenney, et al., 2012,. Is Urban Stream Restoration Worth It? *Journal of the American Water Resources Association* (JAWRA) 48(3): 603-615. DOI: 10.1111/j.1752-1688.2011.00635.x

including rainwater harvesting, pocket wetlands, surface sand filters, dry swales, tree planting, and catch basin cleaning.[2]

Moreover, these cost data only reflect the short term. They do not compare the lifecycle cost of these investments over time: the maintenance, repair, replacement, and loss of ecosystem services. Stream restorations often fail, making their true costs far higher than original estimates. A restoration of Lower Booze Creek in Montgomery County failed shortly after the completion of a $700K project, with subsequent repairs ballooning the total costs to $4.9 million.[3]

The recent stream restoration done by the University of Maryland Baltimore County provides another concerning example. At a cost of $27 million, this controversial stream restoration demolished a wetland in the Spring Grove Arboretum and took out huge trees which have kept the stream so stable that it survived a 1,000 year flood without leaving its channel. Now a local forester predicts "I don't think it's going to hold up when the next heavy rain comes."[4]

The bill requires that any project receiving pollution control credits demonstrate "measurable functional lift" verified by post-construction monitoring. This lift must include some improvement to biological habitat or ecological function, and not be based solely on physical channel stability. This will help to ensure that pollution and mitigation credits are based on results, not simply on how many miles of streambed are dug up, reshaped or hardened with rocks.

Some stream restorations are necessary to protect infrastructure in dense urban areas, but they can be very destructive ecologically, especially in the Piedmont region, and often fail to improve water quantity and quality objectives. Several major published scientific studies confirm this. **A meta study looked at 644 projects and concluded that "improvements in all the five metrics within the water quality category were found for only 7% of the channel reconfiguration projects and for none of the in-stream channel projects…Recovery of biodiversity was rare for the vast**

[2]Annual Report on Financial Assurance Plans and the Watershed Protection and Restoration Program, 2022 Maryland Department of the Environment, Appendix C. pp. 21-23 https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/FAP-WPRP/2022%20Stormwater%20Financial%20Assurance%20Plan%20Annual%20Report%20to%20Governor_%20MSAR%20%23%2010954%2010.18.2022.pdf

[3] Montgomery County Council, May 23, 2023 Work session, Environmental Protection budget, p. 57 https://www.montgomerycountymd.gov/council/Resources/Files/agenda/col/2023/20230510/20230510_50.pdf

[4]K. Hille, "UMBC claims compliance in $27 million project that removed 1,000-plus trees at Spring Grove," *Baltimore Sun*, Feb.14, 26. https://www.baltimoresun.com/2026/02/14/umbc-tree-clearing-reaction/

majority of stream restoration projects."[5] Another report concludes that "following large amounts of stream restoration, there is often an apparent decline in stream health."[6] Still another study of 40 urban stream restorations in Maryland done for the Chesapeake Bay Trust concludes that "the ecological aspects rarely improved despite the improved physical measures…In fact, the unrestored sections upstream were often ecologically better than the restored sections or those downstream of the restorations."[7]

The disturbing study results are not so surprising when one considers how typical stream restorations are done. To make room for heavy earth moving equipment, hundreds of trees must be removed and the earth scraped bare, killing everything from the tree canopy down to the soil's micro-organisms and stream bed. Without shade from the trees, streams are often left to bake in the sun, raising water temperatures to levels higher than some aquatic species can tolerate, including insects and fish. Contractors are required to plant native trees and other vegetation once construction is completed, but it is hard for these plants to thrive in compacted soil and it takes generations for trees to mature. The denuded sites create opportunities for invasive plant species which rush in to fill the void. These invasive plants outcompete our natives and do not support our native insects, birds, and other wildlife.

One of the most aggressive invasive plants is Japanese stiltgrass. Research on the impact of stream restorations on riparian forests found that this invasive species benefited the most, especially when efforts were made to connect a stream with its floodplain. "The dominant herbaceous species across all study sites and treatment was Japanese stiltgrass…which was found at 22 out of 27 plots in 2020…Japanese stiltgrass was the only herbaceous species that comprised 75-100% of ground cover of any study plot," according to a Maryland study commissioned by Chesapeake Bay Trust.[8]

Despite the intentions of these projects, the removal of so many trees and their deep roots can further destabilize the banks, making streams even more vulnerable to

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[5] M.A. Palmer, et al., 2014. "Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals," *Annual Review Ecology, Evolution, and Systematics*. 45:247-269. https://doi.org/10.1146/annurev-ecolsys-120213-091935

[6] R. Jepsen, et al., 2022. *An Analysis of Pooled Monitoring Data in Maryland to Evaluate the Effects of Restoration on Stream Quality in Urbanized Watersheds*, Interstate Commission on the Potomac River Basin; Center for Watershed Protection https://www.potomacriver.org/wp-content/uploads/2022/06/ICP-22-1_Jepsen.pdf

[7] R. H. Hilderbrand et al., c. 2019. "Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland," grant report to Chesapeake Bay Trust, 2020 p.2. https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf

[8] D. Budelis, et al., "An Evaluation of Forest Impacts Compared to Benefits Associated with Stream Restoration" Chesapeake Bay Trust Research Award Program, 2020 pages 13-14 https://cbtrust.org/wp-content/uploads/Award14833_RestoResearch2017_FinalReport_Versar.pdf

erosion, if they continue to be fire-hosed by stormwater rushing off paved surfaces above. It can take over a hundred years for the tree canopy to be restored.

In our cities and suburbs, many of our remaining natural areas are in stream valleys targeted by restoration projects. We need the riparian forests in these valleys to cool our cities in a time of climate change, sequester greenhouse gases, support wildlife, and give both children and adults access to nature.

The Chesapeake Bay Comprehensive Evaluation of System Response (CESR) report tells us that 50 to 90% of runoff pollution is coming from only 5 to 20% of the land.[9] It recommends that we target critical areas. We don't need to control stream erosion everywhere, because not all silt ends up in the Bay. When streams can meander, the silt from erosion on one bank usually ends up on a beach around the next bend.[10]

Green infrastructure uses living vegetation to absorb and control stormwater, remove excess nutrients and control sediment. There are many studies showing that these interventions done before stormwater enters streams are cost effective. The report *Banking on Green* found that "75% of green infrastructure projects cost less than (44%) or equal to (31%) gray infrastructure solutions."[11] The EPA came to a similar conclusion in their report about reducing stormwater costs through Low Impact Development Strategies (LID) environmental site designs. "Total capital cost savings ranged from 15 to 80 percent when LID methods were used."[12] A compilation and meta-analysis of 39 different studies looked at a wide variety of upland stormwater controls including bioretention, infiltration, swales, ponds, grass channels,permeable pavement and green roofs. On average, these interventions achieved stormwater runoff reduction rates ranging from 59% to 89%.[13]

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[9] "K. Stephenson and D. Wardrop, eds.,(2023). *Achieving water quality goals in the Chesapeake Bay: A comprehensive evaluation of system response*, STAC Publication number 23-006, Chesapeake Bay Program Scientific and Technical Advisory Committee (STAC). p.38
https://www.chesapeake.org/stac/wp-content/uploads/2023/05/CESR-Final-update.pdf

[10] J Thompson et al, "The multiscale effects of stream restoration on water quality, Ecological Eingineering, 2018 pp. 7-18
https://www.sciencedirect.com/science/article/abs/pii/S0925857418303537?via%3Dihub

[11]*Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide,* Apr. 2012. American Rivers, the Water Environment Federation, the American Society of Landscape Architects and ECONorthwest p.8
. https://www.americanrivers.org/wp-content/uploads/2017/03/banking-on-green-report.pdf

[12]U. S. Environmental Protection Agency, 2007, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*
https://www.epa.gov/sites/default/files/2015-10/documents/2008_01_02_nps_lid_costs07uments_reducingstormwatercosts-2.pdf

[13] Updating the Runoff Reduction Method, report commissioned by Tennessee Metro Water Service, 2018
hirschmanwater.com/wp-content/uploads/2018/07/RRM-Nashville_Report_FINAL_060718.pdf

Green infrastructure projects like these can better control stormwater, pollution and erosion, help prevent the damage to our streams and offer potential savings as compared to stream restorations. This is the intent of this bill and why we urge a favorable report on HB688.

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