SB969 - Whole Watershed Act

COMMITTEE - Education, Energy and the Environment

Testimony on SB969

POSITION – Unfavorable [without amendments]

Hearing Date - March 5, 2024

Thank you for this opportunity to testify on behalf of the grassroots organization, Protect Our Streams. My name is Sharon Boies.

1. Maryland's native stream corridors and ecosystems are invaluable, irreplaceable, and all too finite. Maryland's natural forest-covered riparian stream ecosystems are complex and fragile. Many Maryland streams begin as cold or cool springs and are the headwaters for crucial sources of clean drinking water. Stream ecosystems encompass unique biological communities comprising species which have co-evolved over untold amounts of time to form a healthy functioning biological community. They also provide critical human services. For example, established stream corridor forests absorb stormwater runoff, capture and retain nutrients, silt and sediment and recharge the groundwater.

And they are increasingly important during our era of climate change. Shady forests are the counter measure for heat islands, they sequester carbon, produce oxygen, and provide critical habitat for birds, reptiles, amphibians, bats, and insects. Finally, wooded natural stream corridors provide us with a healthy connection with nature.

https://www.nasa.gov/press-release/nasa-shares-first-images-from-us-pollution-monitoring-instrument/

- Please review the image of the air pollution over Howard County and Central Maryland

2. Maryland's natural stream ecosystems are complex, fragile and under stress. Maryland streams have been placed under enormous pressure as they receive more polluted stormwater runoff and silt and sediment from our actions that include deforestation, paving, and development, and from increasing amounts of precipitation due to climate change.

3. Maryland's forested stream corridors are also threatened by heavily engineered stream restoration practices. As you may know, the Maryland Department of the Environment awards obligatory, TMDL and other types of credits to MS4/NPDES permit holders for restoration activities in Maryland watersheds. Stream restoration (as defined by the state of Maryland) is a common way to generate credits within this Total Maximum Daily Load Reduction system. A second driver of stream restorations in Maryland is the need for mitigation credits which are sold to developers and others to offset permanent environmental harm elsewhere. Whether in service to state water quality objectives or offsets, credit generation is the primary driver of " stream restoration" project proposals. In both cases, credit generation is now big business for contractors. Currently, the nature of the stream restoration projects that may potentially generate water quality credits under this program ranges widely.

Three fundamental types of stream restoration have been described in the scientific literature:

- those focused on heavily engineered practices such as stream bank removal and reinforcement by armoring them with imported rock, step pools and stream channel and meander re-alignment;
- those incorporating ecological considerations but still focused solely on alterations of the stream channel by practices such as filling in the stream channel to raise the stream bed with imported materials and loose substrates which can wash out during a large rain event; and

- those incorporating measures addressing the broader watershed area to attenuate storm water run-off to the stream channel.

Unfortunately, the most common approaches in practice are those focused on direct stream bank and channel alterations and reinforcements to armor stream banks against erosion caused by heavy stormwater flows (the first two). These heavily engineered approaches (also known as “designed” approaches) necessitate counterproductive, often severe disruption of existing stream ecological communities, and removal of mature trees to give heavy construction machinery access. Removing mature trees along streams seriously degrades the stream system *even if saplings are then planted*. Further, studies are finding that designed stream “restoration” projects like these lack effectiveness in biological improvement (uplift) for aquatic organisms, even over time. To put it plainly, as a functioning ecological system, the stream may never recover, new tree plantings or not. Finally, the engineered changes are unlikely to deliver even the hoped-for stream flow management over time because the problem of upland run-off volumes and rates remains unchanged or has worsened. That is why these engineered systems have a life expectancy of about 10 years and many require unanticipated repair so soon after completion which can cost more to repair than the original project (An example of this is Lower Booze Creek) see link below.

https://www.google.com/url?q=https://www.montgomerycountymd.gov/water/restoration/booze-creek.html&sa=D&source=docs&ust=1709559407394120&usg=AOvVaw1WJ_CqxQKUvPHICGYQgiWt).

To summarize, we are fooling ourselves if we think we can tear streambeds up, remove large numbers of mature trees in the process, and then recreate a new drainage system that functions like a natural stream. We must stop converting stream ecosystems into stormwater management facilities and expect them to be healthy.

https://www.youtube.com/watch?v=NvTvPnG6Qs8 - Please watch this short video of a typical stream restoration.

4. There are alternative approaches. Preserving mature trees and installing BMP’s in the upland watershed have demonstrated storm water control effectiveness and it often costs less. Fortunately, there are 31 other alternatives to construction-heavy and stream channel-centric restoration methods available to help reduce stream flows and that generate credits within MDE’s Accounting Guidance to meet MS4 permit credit obligations. They are simply overlooked and underutilized. These “green” approaches address the run-off problem at its source, reducing drainage to subject streams from upland areas. Techniques include strategic use of rain gardens, bioretention techniques, tree plantings (as opposed to counterproductive vegetation removal), permeable pavement, and native lawn vegetation. These upland practices reduce stormwater run-off before it can enter streams and can ultimately eliminate the need for disruptive streambed alterations altogether. Scientific evidence is showing alternative approaches such as these are more effective than engineered approaches at restoring biological assets of streams.

5. Maryland law should incentivize stream restoration approaches that preserve trees, and capture stormwater runoff where it’s occurring and discourage approaches that result in ever more tree loss and without requiring proof or evidence of improvements to water quality or biological uplift. Maryland guidance and law surrounding stream restorations should disincentivize reengineered stream systems and incentivize green restoration alternatives. Maryland also should incorporate an accounting process for public review on the extent to which Maryland stream resources, including upland forests, have been conserved, or lost. There are not enough stream resources in the state of Maryland for the current “trial and error” approach to stream restorations driven by the MS4 program. Once we’ve lost them, they are gone forever. We rely on the health of the remaining ecosystem and populations of wildlife to repopulate the construction site but if there isn’t any wildlife left, or habitat to return to, they do not come back. Maryland should take a precautionary approach by incentivizing less destructive methods.

6. Without amendment, SB969 could have the effect of closing the door to improvements in the future. While it is clear much effort has gone into the legislation currently before this chamber, left unamended, the Whole Watershed Act will, perhaps unintentionally, cement in place current heavily engineered approaches to stream restorations which are so destructive to mature trees, native streams, and existing ecosystems.

If this legislation is passed or not carefully amended, this may be "it" for Maryland's riparian forests. In particular, re-planted saplings are a requirement for obtaining a waiver from The Forest Conservation Act, but saplings do not equal mature trees when it comes to carbon storage and eco- benefits, that is, we can not plant our way out of this loss. Saplings do not produce acorns.

https://www.youtube.com/watch?v=0D0zp7Q4YnE - Please watch this short video about deforestation and carbon storage, we are losing Oaks in stream restorations at an alarming rate.

There are many ways to improve the process. The challenge is how do we ensure that our projects don't go overboard to the detriment of our streams? I appreciate this bill recognizes that changes need to occur. Therefore, I suggest the following amendments at a minimum:

- Provide additional funding to MDE by eliminating the exemption of application fees for stream restoration projects.
- Require pre- and post-project mature tree maps and a preservation plan.
- Require applications to include plans that specify how projects will improve or align with goals regarding biological and ecological uplift, water quality, forest preservation, and reduce the impacts of climate change.
- Require expanded public notice, transparency, and community engagement in the process.
- Require baseline testing and erosion studies with bank pins – not just visual checks, to ensure project success after completion with penalties for projects that fail.

7. **Necessary additional changes.** In addition to these concerns, I must state the following:

- I oppose the licensing board and suggest an amendment to replace it with a scientific advisory board comprised of experts without direct financial reliance on the stream restoration industry.
- I oppose funding the 20 million dollars Whole Watershed Fund when our state is facing a budget shortfall and we are being told that there isn't any money for testing and compliance for existing projects or enough staff for MDE to hold meetings for all new stream restoration projects.
- I oppose solicitation of stream restorations by contractors, that seems like chasing credits.We should not allow stream selection for these projects to be determined by just who will allow it. We should not legitimize a practice that is still requiring 20 million dollar pilot projects, 30 years after we have been permitting them, to determine if they work or not. The health of the bay has shown little improvement and who can determine how much of that little improvement can scientifically be attributed to stream restorations? Where's the proof?

8. Regarding the proposed pilot projects. Finally, I question after Maryland has permitted over 700 projects in the past decade or so and for hundreds of millions of dollars, why would we spend 20 million more dollars on 5 pilot projects to analyze the results? Wouldn't the 20 million dollars be better spent on a study of the 700 projects, of all ages and practices applied, to determine the results of these projects first before we allow this practice to continue? I propose as an alternative, a pause, our natural processes, and natural resources have been through a lot and need a break and so does our wildlife. I propose Maryland spend the 20 million dollars to study what we have already done to determine if there has been any benefit at all, have the trade- offs been worth the losses? With no baseline testing and monitoring and only visual checks instead of using erosion bank pins for years, how can anyone honestly say?

In conclusion, if these suggested amendments are added to the bill, my hope would be that stream restorations practices in Maryland will become more aligned and consistent with what the current science suggests we must do to improve the health of our streams and the bay, and to reduce the unintended consequences as a result of the currently used processes.

Thank you for this opportunity to submit testimony regarding potential risks of SB969. Senator Elfreth's legislation as currently drafted and ways to improve it. I urge you to only vote in favor of this bill if all of the above amendments are adopted, otherwise I oppose this bill and I ask you for an unfavorable report if the vote is on the current suggested language.

Sharon Boies

Columbia MD

Protect Our Streams

GENERAL RESOURCES

Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for National Pollutant Discharge Elimination System Stormwater Permits"

Berland, Adam, Sheri A. Shiflett, William D. Shuster, Ahjond S. Garmestani, Haynes C. Goddard, Dustin L. Herrmann, and Matthew E. Hopton. 2017. The Role of Trees in Urban Stormwater Management. Landscape and Urban Planning, Vol. 162, Pg. 167-177.

Cappiella, K., T. Schueler, and T. Wright. 2005. Urban Watershed Forestry Manual: Part 1.

Center for Watershed Protection. 2017. Making Urban Trees Count. This web-based article included a review of 159 publications.

Center for Watershed Protection. 2022. Using a Novel Research Framework to Assess Water Quality Impacts of Urban Trees. Study funded by Chesapeake Bay Trust. July 2022.

https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N 5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf

Fejerskov, Morten & Kristensen, Klaus & Friberg, Nikolai. (2014). Re-Meandering of Lowland Streams: Will Disobeying the Laws of Geomorphology Have Ecological Consequences?. PloS one. 9. e108558.

Hildebrandt et al Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland Final Report Submitted to the Chesapeake Bay Trust for Grant #13141. Robert H. Hilderbrand and Joseph Acord, Appalachian Laboratory University of Maryland Center for Environmental Science And Collaborators Timothy J. Nuttle and Ray Ewing Civil and Environmental Consultants, Inc. 333 Baldwin Road, Pittsburgh, PA 15205

https://www.umces.edu/research-highlights/restoring-streams#:~:text=Bob%20Hilderbrand%2C%20an%20associate%20professor%20at%20the%20University,back%20to%20the%20thriving%20ecosystem%20they%20once%20were.

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Kaushal, Sujay S., Kelsey L. Wood, Phillippe G. Vidon, and Joseph G. Gallela. 2021. Tree Trade-offs in Stream Restoration Projects: Impact on Riparian Groundwater Quality. Study funded by Chesapeake Bay Trust. March 2021.

Laub, Brian & McDonough, Owen & Needelman, Brian & Palmer, Margaret. (2013). Comparison of Designed Channel Restoration and Riparian Buffer Restoration Effects on Riparian Soils. Restoration Ecology. 21. 10.1111/rec.12010.

Nelson, Kären & Palmer, Margaret & Pizzuto, James & Moglen, Glenn & Angermeier, Paul & Hilderbrand, Robert & Dettinger, Michael & Hayhoe, Katharine. (2008). Forecasting the Combined Effects of Urbanization and Climate Change on Stream Ecosystems: From Impacts to Management Options. Journal of Applied Ecology. 46. 154 - 163. 10.1111/j.1365-2664.2008.01599.x.

North Street Neighborhood Association. 2009. Watering-Up: Studies of Groundwater Rising After Trees Cut.

Palmer, Margaret & Hondula, Kelly & Koch, Benjamin. (2014). Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals. Annual Review of Ecology, Evolution, and Systematics. 45. 247-269. 10.1146/annurev-ecolsys-120213-091935.

Palmer, Margaret A., Solange Filoso, and Rosemary M. Fanelli. 2013. From Ecosystems to Ecosystem Services: Stream Restoration as Ecological Engineering. Ecological Engineering, Vol. 65, Pgs. 62-70.

Pennino, Michael & McDonald, Rob & Jaffe, Peter. (2016). Watershed-scale impacts of stormwater green infrastructure on hydrology, nutrient fluxes, and combined sewer overflows in the mid-Atlantic region. Science of The Total Environment. 565. 10.1016/j.scitotenv.2016.05.101[1]

Sanford, Ward E., and David L. Selnick. 2012. Estimation of Evapotranspiration Across the Conterminous United States Using a Regression with Climate and Land-Cover Data. Journal of the American Water Resources Association. Vol. 49, Issue 1.

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Wortley, Liana & Hero, Jean-Marc & Howes, Michael. (2013). Evaluating Ecological Restoration Success: A Review of the Literature. Restoration Ecology. 21. 10.1111/rec.12028.

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Welty, Claire, Andrew J. Miller, and Jonathan M. Duncan. 2021. Quantifying the Cumulative Effects of Stream Restoration and Environmental Site Design on Nitrate Loads in Nested Urban Watersheds Using a High-Frequency Sensor Network. Study funded by Chesapeake Bay Trust Award #15828. 2021.

https://www.umces.edu/research-highlights/restoring-streams#:~:text=Bob%20Hilderbrand%2C%20an%20associate%20professor%20at%20the%20University,back%20to%20the%20thriving%20ecosystem%20they%20once%20were.

https://www.epa.gov/chesapeake-bay-tmdl

https://www.fema.gov/pdf/about/regions/regionx/Engineering_With_Nature_Web.pdf
https://www.baltimoresun.com/2023/10/13/environmental-groups-concerned-by-upcoming-construction-along-herring-run-in-northeast-baltimore/ - Please read this article about a neighborhood who could be impacted by a project.

https://www.thebaltimorebanner.com/community/climate-environment/stream-restoration-howard-county-plumtree-branch-EZWMOFQ4ONFNHPPNKTBIKQXGBM/?schk=&rchk=&utm_source=The+Baltimore+Banner&utm_campaign=9a3781df72-NL_AMSC_20231103_0600&utm_medium=email&utm_term=0_-9a3781df72-%5BLIST_EMAIL_ID%5D&mc_cid=9a3781df72&mc_eid=03e98bc6d3 - Please read this article about a neighborhood that stood to be impacted by a project.

https://www.baltimorebrew.com/2023/12/23/restoration-of-baltimores-stony-run-is-failing-again-residents-and-scientists-say/ - please read this article

https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N 5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf

US Environmental Protection Agency. 2023. Soak up the Rain: Trees Help Reduce Runoff

ARTICLES SHOWING ENGINEERED STREAM RESTORATIONS ARE NOT DELIVERING DESIRED OUTCOMES

Beauchamp, Vanessa, Joel Moore, Patrick McMahon, Patrick Baltzer, Ryan A. Casey, Christopher J. Salice, Kyle Bucher, and Melinda Marsh. 2020. Effects of Stream Restoration by Legacy Sediment Removal and Floodplain Reconnection on Water Quality and Riparian Vegetation. Study funded by Chesapeake Bay Trust Award #13974. December 2020.

Berland, Adam, Sheri A. Shiflett, William D. Shuster, Ahjond S. Garmestani, Haynes C. Goddard, Dustin L. Herrmann, and Matthew E. Hopton. 2017. The Role of Trees in Urban Stormwater Management. Landscape and Urban Planning, Vol. 162, Pg. 167-177.

Budelis, Drew, Lauren McDonald, Steve Schreiner, and Donald E. Strebel. 2020. An Evaluation of Forest Impacts Compared To Benefits Associated with Stream Restoration. Study funded by Chesapeake Bay Trust Award #14833. February 2020Cappiella, K., T. Schueler, and T. Wright. 2005. Urban Watershed Forestry Manual: Part 1.

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Groffman, Peter M., Ann M. Dorsey, and Paul M. Mayer. 2005. N Processing within Geomorphic Structures in Urban Streams. Journal of the North American Benthological Society 24: 613-25.

Hawley, Robert J., Kathryn Russell, and Taniguchi-Quan, Kristine. 2022. Restoring Geomorphic Integrity in Urban Streams via Mechanistically-Based Storm Water Management: Minimizing Excess Sediment Transport Capacity. Urban Ecosystems. Vol. 25, p. 1247-1264.

Hilderbrand, Robert H. 2020. Determining Realistic Ecological Expectations in Urban Stream Restorations. Study funded by Chesapeake Bay Trust Award #15823.

Howard County DPW NPDES Permit MD0068322 Annual Report for Fiscal Year 2021.

Kaushal, Sujay S., Kelsey L. Wood, Phillippe G. Vidon, and Joseph G. Gallela. 2021. Tree Trade-offs in Stream Restoration Projects: Impact on Riparian Groundwater Quality. Study funded by Chesapeake Bay Trust. March 2021.

Palmer, Margaret A., Solange Filoso, and Rosemary M. Fanelli. 2013. From Ecosystems to Ecosystem Services: Stream Restoration as Ecological Engineering. Ecological Engineering, Vol. 65, Pgs. 62-70.

Methods Integrate and Quantify Fluvial Processes and Channel Response? Abstract from conference paper. DOI publication 10.1061/40792(173)584.

North Street Neighborhood Association. 2009. Watering-Up: Studies of Groundwater Rising After Trees Cut.

North Street Neighborhood Association. 2009. Watering-Up: Studies of Groundwater Rising After Trees Cut.

Sanford, Ward E., and David L. Selnick. 2012. Estimation of Evapotranspiration Across the Conterminous United States Using a Regression with Climate and Land-Cover Data. Journal of the American Water Resources Association. Vol. 49, Issue 1.

Simon, A., M. Doyle, M. Kondolf, F.D. Shields, B Rhoads, G. Grant, F. Fitzpatrick, K. Juracek, M. McPhillips, and J. MacBroom. 2005. How Well do the Rosgen Classification and Associated "Natural Channel Design"

Simon, A., M. Doyle, M. Kondolf, F.D. Shields Jr., B. Rhoads, and M. McPhillips. 2007. Critical Evaluation of How the Rosgen Classification and Associated "Natural Channel Design" Methods Fail to Integrate and Quantify Fluvial Processes and Channel Response. Journal of the American Water Resources Association (JAWRA). Vol. 43, Number 5, Pg. 1117-119.

Thompson, Tess, and Eric Smith. 2021. Improving the Success of Stream Restoration Practices – Revised and Expanded. Study funded by Chesapeake Bay Trust Award #13970. June 2021.

Welty, Claire, Andrew J. Miller, and Jonathan M. Duncan. 2021. Quantifying the Cumulative Effects of Stream Restoration and Environmental Site Design on Nitrate Loads in Nested Urban Watersheds Using a High-Frequency Sensor Network. Study funded by Chesapeake Bay Trust Award #15828. 2021.

US Environmental Protection Agency. 2023. Soak up the Rain: Trees Help Reduce Runoff

RESULTS FROM WATERSHED MONITORING IN WHICH RESTORATIONS HAVE OCCURED.

The annual update of results from watershed monitoring includes several watersheds in which "stream restorations" had occurred in prior years. The results are as follows:

- Wilde Lake – the report discusses the erosion and sedimentation status of the upstream reach (the location of the Longfellow "stream restoration" project) and the downstream reach. As of 2021, the "upstream reaches are not experiencing the same level of erosion as the downstream reach and have remained relatively stable over 2017-2021 period". Given this observation, it is not clear why a "stream restoration" project was implemented in the upper reach in 2020-21. The report goes on to state that a "newly constructed stream restoration project in the upstream reach should provide increased stability". Since the upper reach was not exhibiting any instability, it is not clear how such a destructive project in that area, removing acres of trees, can be expected to provide "increased stability".
- Red Hill Branch – This area is downstream of the Bramhope Lane stream restoration project done in 2011. The monitoring in 2021 found no improvement in water quality. The biological monitoring results "have not shown any significant improvement after restoration". The results did show a reduction in erosion, but noted that flood damage to an upstream debris dam had contributed sediment into the survey area.
- Dorsey Hall – The post-restoration biological and physical monitoring results showed that "habitat results have been similar throughout the post-restoration period", with the sites falling into the lowest "severely degraded" category. The physical habitat

results show that both monitored sites continue to be severely impacted, “with no evidence yet of ecological uplift after restoration”.

Howard County DPW NPDES Permit MD0068322 Annual Report for Fiscal Year 2022.

The annual update of results from watershed monitoring includes several watersheds in which “stream restorations” had occurred in prior years. The results are as follows:

- Wilde Lake – The water quality results continued to show elevated total suspended solids concentrations. With respect to biological monitoring, the report states “Overall, the stream system in the Wilde Lake watershed continues to exhibit evidence of the urban stressors affecting it and has not demonstrated measured improvement in either habitat quality or ecological stream health over the seventeen years of monitoring.”.
  Most concerning is the geomorphic assessment, conducted long after the Longfellow project was completed. The text states “The main goal of the monitoring is to assess the temporal variability of the geomorphic stability of the stream channels upstream of the lakes as they react to restoration activities. Overall, implementation of projects in the watershed do not appear to have significantly improved the physical habitat in the tributary streams.”
- Red Hill Branch – This area is downstream of the Bramhope Lane stream restoration project done in 2011. The monitoring in 2021 found no improvement in water quality. The biological monitoring results show that “post-restoration monitoring results indicate a subwatershed in an overall degraded ecological condition, with little change from the first two years of pre-restoration monitoring.” In fact, the BIBI scores in 2022 were “slightly worse results than during 2021”. Habitat assessments in 2022 were “nearly identical to 2021 and 2020 results”, with all sites rated as “degraded”. The text states “The biological community and habitat continue to fluctuate slightly from year-to-year, with 2022 results a slight decrease from 2021, but remain in a degraded condition and have not shown any significant improvement after restoration. The report did note that there had been reductions in erosion.
- Dorsey Hall – The post-restoration biological and physical monitoring results were the same as reported for 2021. The report showed that “habitat results have been similar throughout the post-restoration period”, with the sites falling into the lowest “severely degraded” category. The physical habitat results show that both monitored sites continue to be severely impacted, “with no evidence yet of ecological uplift after restoration”.