

Coalition to Stop Stream Destruction

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Montgomery County Council
Council Office Building
100 Maryland Avenue, 6th Floor
Rockville, MD 20850

Subject: Written testimony on FY26 Capital Budget and Amendments to the FY25-30 Capital Improvements Program (CIP)

Position: Remove funding for stream “restorations”

References:

FY26 budget documents<https://www.montgomerycountymd.gov/omb/publications.html>

FY26 Recommended Capital Budget and Amendments to the FY25-30 Capital Improvements Program (CIP):
<https://apps.montgomerycountymd.gov/BASISCAPITAL/Common/biennialindex.aspx?FY=2026&VER=REC>

Office of Management and Budget, Open Budget
<https://www.montgomerycountymd.gov/omb/open-budget.html>

Office of Management and Budget, Capital Budget
<https://apps.montgomerycountymd.gov/BASISCAPITAL/Common/Index.aspx>

Projects by Category:
<https://apps.montgomerycountymd.gov/BASISCAPITAL/Common/ProjectMeta.aspx?ID=0&TYPE=CAT>

Dear Council President Stewart, Vice President Jawando, and Councilmembers:

The Coalition to Stop Stream Destruction (CSSD) urges you to stop the waste, fraud, and abuse that is being perpetrated in the county by the funding of so-called stream “restorations.” Instead, stream “restoration” funds should be shifted to out-of-stream stormwater control projects in the FY26 Capital Budget and Amendments to the FY25-30 Capital Improvements Program (CIP).

Contents

Parks and DEP didn’t get the tree memo..... 2

Parks and DEP practice “garbage in, garbage out” 3

False claims by Parks and DEP 4

Specific sections in the budget to remove stream “restoration” funding 5

Coalition to Stop Stream Destruction

Science-deniers ignore evidence that stream “restorations” do not work	6
DEP uses bogus cost justification for stream “restorations”	8
Stream “restorations” are incompatible with environmental justice	8
Closing remarks	8
Appendix 1: Details from Conservation of Natural Resources category and M-NCPPC category in FY26 Capital Budget with reasons to defund stream “restorations”	10
Appendix 2: Photos of damage done by stream “restorations”	12
Appendix 3: Photos of failed stream “restorations”	18
Appendix 4: Scientific references that show stream “restorations” do not work	24
Appendix 5: Misleading DEP price comparison	27
Appendix 6: CSSD comments on DEP’s response to our call for ban on stream “restorations”	28
Appendix 7: CSSD response to Montgomery Parks’ 1/10/2025 letter opposing a stream “restoration” ban	32
Appendix 8: Proposed bill to encourage stormwater control on private property	82

Parks and DEP didn’t get the tree memo

Apparently, neither DEP nor Parks got the memo on the value of trees.

Montgomery County launched its Climate Smart Campaign on Jan. 28, 2025. The launch announcement said that one of the everyday behaviors residents can take to reduce their carbon footprint is to “Plant a tree; trees remove carbon from the air, cool the planet, provide habitat and beautify our neighborhoods.” Yet the photos below and a [video of the Glenallan stream “restoration”](#) show that DEP and Parks are clear cutting forests for misguided stream “restorations.”



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(Above: Examples of what DEP calls “careful protection of trees” at the Glenallan Tributary stream “restoration” near Brookside Garden from [video of the Glenallan stream “restoration”](#))

The county’s Climate Action Plan has a goal to “Retain, increase, and restore terrestrial ecosystems including forests...” DEP’s website states that “Trees contribute to the economic and social vitality of every community. Trees clean the air and water, reduce the cost of cooling and heating homes and businesses, increase biodiversity, and increase our general sense of well-being.” And yet, hypocritically, the county continues to approve the clearcutting of countless trees, shrubs, and other forest plants in our natural areas for unnecessary stream “restorations.”

Parks and DEP practice “garbage in, garbage out”

Parks and DEP apparently practice the “garbage in, garbage out” concept which is “that flawed, biased or poor-quality input produces a similar output.”¹

In this case, “garbage in” is the voluminous number of false claims by Parks and DEP that these projects improve water quality, reduce erosion, and improve the ecology among other disinformation (see details of the debunked claims used by DEP and Parks to justify stream “restorations” in Appendices 6 and 7).

“Garbage out” is the resulting destroyed natural areas with no improved water quality, no reduced erosion, and no ecological improvement. Adding insult to injury, these projects get washed out by storm events because they do not fix the root cause of stream erosion – uncontrolled stormwater from impervious surfaces such as roads and parking lots that fire hoses into streams. These washed-out projects are then repaired at great expense to taxpayers. For

¹ https://en.wikipedia.org/wiki/Garbage_in,_garbage_out

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example, the Lower Booze Creek stream “restoration” in Potomac was repaired for \$3.6 million². See Appendix 2 for photos of damage done by stream “restorations,” Appendix 4 for scientific references which analyzed over 700 stream “restorations” to conclude that stream “restorations” do not work, and Appendix 3 for photos of washed-out stream “restorations.”

In fact, DEP has admitted that none of their past projects have improved stream ecology³. There is no scientific basis for continuing the destruction caused by stream “restorations.”

Yet Parks and DEP continue to promote these stream engineering projects by giving false information to residents and elected officials (more below). And we all know the definition of insanity sometimes attributed to Einstein, which is “doing the same thing over and over again and expecting a different result.”

False claims by Parks and DEP

Among the many falsehoods and claims by Parks and DEP (which are debunked in Appendices 6 and 7) are the following:

- They falsely claim that stream “restoration” is “a science-backed practice recognized ...to provide both water quality and ecological benefits.”
- They falsely claim that “These projects have been shown to improve water quality, reduce erosion... and enhance habitat,” among other claims.
- They falsely imply that stream “restorations” are *required* to meet TMDL and MS4 permit requirements.
- They falsely claim that “stream restoration projects involve temporary disturbances” rather than permanent or long-term ones.
- They fail to acknowledge that the published scientific literature shows that stream “restorations” do not stabilize streams, improve water quality, or improve ecological function.
- They fail to act on the knowledge that stream “restorations” do not stop the root cause of stream erosion - uncontrolled stormwater from developed areas that firehoses into streams.
- They falsely claim that they have the full support of all adjacent property owners.

² Per DEP, <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Presentation.pdf> (removed by DEP).

³ Montgomery County Department of Environmental Protection presentation to Stormwater Partners Network on January 16, 2024. “We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations.” BMIs are a standard measure of stream health.

Coalition to Stop Stream Destruction

- They falsely imply that because the project was permitted, that doing it is the right thing.
- They falsely claim that tree removal is minimal and that the remaining trees are adequately protected.
- They falsely imply that projects will have a successful invasives management plan.
- They falsely imply that “a robust planting plan” will mitigate the damage done by clearcutting the original forest.
- They fail to disclose that the “geotextile materials” being used is actually plastic sheeting which will break down into microplastics when it is washed-out and exposed to light.
- They falsely claim that there is not enough upland space for out-of-stream projects. (See Appendix 8 for our proposed bill to encourage stormwater control on private property.)

Our detailed responses to DEP’s and Parks’ false claims can be found in our attached letters (Appendices 6 and 7 respectively) and at the following links:

[“CSSD comments on Mo Co DEP’s 12/19/2024 response to call for stream “restoration” ban.”](#)

[“CSSD response to Montgomery Parks 1/10/2025 letter opposing a stream ‘restoration’ ban.”](#)

Specific sections in the budget to remove stream “restoration” funding

Specifically, we urge you to remove funding for stream “restorations” from the following projects in the FY26 Capital Budget:

Conservation of Natural Resources category:

- **“Anacostia Streams Restoration”** project: remove funding.
- **“General Repair of BMPs and Stream Assets”** project: remove funding for all stream “restoration” repairs.
- **“Stormwater Management Facility Major Structural Repair”** project: remove funding for all stream “restoration” repairs.
- **“Stormwater Management Retrofit: Countywide”** project: remove funding for all stream “restorations.”

M-NCPPC category:

- **“Stream Protection: SVP”**: remove funding for all stream “restorations”

Appendix 1 has details from the **Conservation of Natural Resources** category and the **M-NCPPC** category projects listed above with specific reasons to defund stream “restorations.”

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To be clear, we are not asking to decrease funding for DEP or Parks by a single dollar. We are only asking that funds be shifted from stream “restorations” to out-of-stream stormwater projects that actually work to stop or decrease stream erosion. Examples of out-of-stream projects are raingardens, roadside bioretentions, grass swales, permeable pavement, and replacing turf with conservation landscaping. These types of projects and others keep stormwater runoff out of streams in first place. Out-of-stream projects are the only way to fix the root cause of stream erosion – uncontrolled stormwater from impervious surfaces such as roads and parking lots that fire hoses into streams.

It is perverse to include funding for stream “restorations” in the Conservation of Natural Resources and M-NCPPC categories (see Appendix 1) since such projects are highly destructive to our natural areas. Watch a short [video of the Glenallan stream “restoration”](#)⁴) near Brookside Gardens to see the destruction done by a typical stream restoration. See the presentation [“Stormwater Control & Stream Restoration: What Works and What Does Not”](#)⁵ on the benefits of out-of-stream stormwater control and the problems with stream “restorations.”

To be clear, we are not against infrastructure protection projects to fix exposed sewer lines in streams, for example. But those are not stream “restorations.” They are infrastructure protection projects that can be done in tens of feet in a stream, not the hundreds or thousands of feet for a typical stream “restoration.”

What about erosion on private property? Again, stream “restorations” simply do not work since they don’t address the root cause of the erosion and they are washed out by post-construction storms. Appendix 3 has photos of washed-out stream “restorations” all over the county. Stormwater needs to be controlled *before* it fire hoses into streams.

To give an analogy, what if you have a leaking roof that is damaging your furniture? No one in their right minds would replace their furniture before the source of the problem is fixed, which is the leaking roof. But this is exactly what is happening with stream “restorations.” DEP and Parks are trying to repair the streams instead of fixing the source of the problem – urban stormwater runoff. This is simply throwing tax dollars away and it is a gross mismanagement of county funds. This is arguably waste, fraud, and abuse.

Science-deniers ignore evidence that stream “restorations” do not work

At this point, there should be no debate about whether or not so-called stream “restorations” work. Only science-deniers can ignore all the scientific and observational evidence that these projects do not work.

⁴ <https://www.youtube.com/watch?v=91O2bAdT8PY>

⁵ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not” https://drive.google.com/file/d/1dos8SmOF5_evul8Y_CWuUMVNHZoVP1Sf/view?usp=sharing

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But we are not asking you to take our word for it.

Appendix 2 has photos showing the destruction caused by stream “restorations.” These photos show the massive loss of fish and wildlife habitat, the loss of habitat for disappearing pollinators like bees and butterflies, the clearcutting of stream-side forests that accelerates global warming and which will take 100 years or more to replace what was destroyed. Stream “restorations” result in the trashing of our natural habitats that are important to protecting our quality of life and for future generations to enjoy.

Appendix 3 has photos of failed stream “restorations” that have been washed out across the county due to lack of adequate out-of-stream stormwater control. Stream “restoration” companies typically only guarantee their projects for one year since they know that these projects will be washed out. After that, the taxpayers foot the bill.

Some examples of washed-out projects in the county (see photos in Appendix 3) include:

- Josephs Branch in Kensington
- Cabin John Creek near Montgomery Mall
- Long Branch in Takoma Park
- Snakeden Branch in Potomac
- Bedfordshire Tributary in Potomac
- Old Farm Creek in North Bethesda (scheduled to be repaired in 2024 for \$800K)
- Grosvenor Luxmanor in North Bethesda (scheduled to be repaired in 2024 for \$4.8M)
- Lower Booze Creek in Potomac (repaired for \$3.6M).

Rather than wasting funds on new stream “restorations” and repairing failed stream “restorations” that will simply get washed out again, this money should be spent on out-of-stream stormwater control projects that prevent stream erosion.

Published scientific papers (see Appendix 4) including meta-analyses from Hilderbrand, Palmer, and others which analyzed over 700 stream “restorations” show that the water quality and ecology is not improved and is sometimes worse as a result of stream “restorations.” DEP gave a presentation about the proposed Grosvenor stream “restoration” to the Stormwater Partners Network on January 16, 2024. One slide says that the project was selected because of the “Opportunity for water quality and ecological improvements.” In fact, DEP says that ecological improvement is a goal for all their stream “restorations.” However, that contradicts the published science and DEPs own admission that “We have not seen benthic [macroinvertebrate] improvement in *any* of our stream restorations.”⁶ BMIs are a standard measure of stream health.

⁶ Montgomery County Department of Environmental Protection presentation to Stormwater Partners Network on January 16, 2024. “We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations.” BMIs are a standard measure of stream health.

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DEP uses bogus cost justification for stream “restorations”

DEP also tries to justify stream “restorations” by claiming they are cheaper than out-of-stream (upland) stormwater control practices (see Appendix 5). But DEP misleadingly compares pricing for stream “restorations” versus “Green Streets” which is actually a DEP program comprised of at least seven different practices including Rain Gardens, Bioretentions, Tree Box Filters, Pervious Sidewalk, Permeable Pavers & Pavement Removal, Curb Extensions, and Grass Swales. DEP does not break out the prices for these seven different practices which is needed for a true comparison between practices.

In fact, Maryland Department of the Environment (MDE) has statewide data from the 2022 Annual Report on Financial Assurance Plans (FAPs)⁷ showing there are twenty non-destructive, out-of-stream project types that are more cost effective than so-called stream “restorations.” Please see the details in Appendix 5.

Stream “restorations” are incompatible with environmental justice

The construction of stream “restorations” is incompatible with the concept of environmental justice. DEP has said they want to give underserved, lower income communities their fair share of stream “restorations.” But why would we want to inflict stream “restorations” on those communities which will cut their trees, destroy their natural areas, increase heat islands, and yet do nothing to actually improve the streams? Why would we want to deprive these communities of the co-benefits of out-of-stream stormwater control such as reducing urban flooding, reducing heat islands, increasing property values, providing urban green spaces, and protecting natural areas?

Closing remarks

In summary,

1. Stream “restorations” destroy natural areas. Direct evidence of washed-out projects and the science show that they do not work to either stabilize streams or improve the ecology. Even DEP admits that none of their past projects improved stream ecology.
2. Budget dollars should instead be spent on out-of-stream stormwater control practices that, unlike stream “restorations,” address a whole list of residents’ concerns such as reducing

⁷<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

Coalition to Stop Stream Destruction

urban flooding, reducing heat islands, increasing property values, providing urban green spaces, and protecting natural areas.

3. There are 20 out-of-stream stormwater control practices that are less expensive than stream “restorations” according to Maryland Department of the Environment. DEP uses misleading explanations to claim otherwise.
4. The way to stop stream erosion is to address the problem at its source - to control stormwater outside of streams by non-destructive practices such as raingardens, bioswales, tree planting, etc. in already disturbed areas.

Finally, a quote from Aldo Leopold: “We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

We can protect our streams and save money by meeting TMDL, MS4 permit, and stormwater control regulations with upland, out-of-stream practices. We urge the County Council to remove funding for stream “restoration” projects and repairs (which will get washed out yet again) and shift these funds to out-of-stream stormwater control projects.

Thank-you for your consideration.

Respectfully submitted,

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Cc: County Executive Marc Elrich
Office of the Inspector General

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Appendix 1: Details from Conservation of Natural Resources category and M-NCPPC category in FY26 Capital Budget with reasons to defund stream “restorations”

Reference:

<https://apps.montgomerycountymd.gov/BASISCAPITAL/Common/ProjectMeta.aspx?ID=0&TYPE=CAT>

Details from the referenced four projects in the **Conservation of Natural Resources category** with reasons to defund stream “restorations.”

- 1) The **Anacostia Streams Restoration** project JUSTIFICATION has information that is simply not true and is easily refutable. It says, “This project is needed to comply with the County’s MS4 permitting requirements and to implement the County’s adopted water quality goals (COMCOR Chapter 19, Article IV) and to protect habitat conditions in local streams.” This is disinformation. A stream “restoration” is *never* required to meet water quality goals per Maryland Department of the Environment’s Accounting Guidance document for MS4 permits⁸, and the science shows that stream “restorations” do not result in improved water quality or ecology - even DEP admits this. (Details in Appendix 4).
- 2) The **General Repair of BMPs and Stream Assets** project DESCRIPTION says, “This project is intended to fund repair sub-projects for stormwater management (SWM) facilities and stream restoration assets.... The intent of this project is to protect and enhance the functioning of these assets to protect water quality.... This work will also provide some climate change resiliency by addressing the sediment erosion impacts of more severe storms.” The repair of stream “restoration” projects is throwing good money after bad. There is a long list of failed stream “restorations” in the county (see photos in Appendix 3) because the root cause of the problem – uncontrolled stormwater from impervious surfaces (roads, roofs, parking lots, etc.) fire-hosing into streams – is not addressed. Failed projects in the county include Josephs Branch in Kensington, Cabin John Creek near Montgomery Mall, Long Branch in Takoma Park, Snakeden Branch in Potomac, Bedfordshire Tributary in Potomac, Old Farm Creek in North Bethesda (scheduled to be repaired in 2024 for \$800K – throwing good money after bad), the Grosvenor Luxmanor project in North Bethesda (scheduled to be repaired in 2024 for \$4.8M – again, throwing good money after bad), and Lower Booze Creek in Potomac (repaired for \$3.6M). These projects are the gift that keeps on giving for the \$25 billion dollar stream “restoration” industry since their guarantee is typically only for one year. Rather than repairing failed stream “restorations” that will simply get washed out again, this money should be spent on out-of-stream stormwater control projects.

⁸<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

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- 3) The **Stormwater Management Facility Major Structural Repair** project JUSTIFICATION states, “This project provides for the design and construction of major structural repairs to County maintained stormwater management facilities.” Any repair of a stream “restoration” is throwing good money after bad. See the photographs of failed projects in Appendix 2. Rather than repairing failed stream “restorations” that will simply get washed out again, this money should be spent on out-of-stream stormwater control projects.
- 4) The **Stormwater Management Retrofit: Countywide** project DESCRIPTION states, “This project provides for the design and construction of new and upgraded stormwater management facilities throughout the County under the County's Municipal Separate Storm Sewer System (MS4) Permit. Facilities include ...stream restorations.” Again, these funds should be used exclusively for out-of-stream MS4 Permit projects.

Detail from the project in the **M-NCPPC category** with reason to defund stream “restorations”:

- 5) “**Stream Protection: SVP**” project DESCRIPTION states, “This project provides design and construction of water quality improvements, best management practices, and environmental enhancements throughout the park system. This work may include... stream restorations....” These funds should be used exclusively for out-of-stream projects since they address the root cause of stream erosion and since the published science concludes that stream “restorations” do not provide water quality improvements.

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Appendix 2: Photos of damage done by stream “restorations”

Nature Forward (formerly ANS), Chevy Chase



(3/26/2021. downstream from Jones Mill Rd. Photos by K. Bawer)

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Falls Reach, Potomac, MD



BEFORE

Before Montgomery County DEP "stream restoration" on Falls Reach. (Photo by DEP)



AFTER

After "stream restoration" on Falls Reach completely destroyed the forest community in its footprint. (Photo by K. Bawer on 3/19/2019)

Stream "Restorations" Don't Restore Streams



Bedfordshire, Potomac, MD

Blocks aquatic wildlife from moving along the streams to hunt and breed.

(By K. Bawer, 10/17/2023)

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Asbury Methodist Village, Montgomery County



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Whetstone Run, Gaithersburg



(Stream "restoration" in Blohm Park, Gaithersburg at Watkins Mill Rd. over Whetstone Run at the same location.
Note the stream bank armor-plating on the right. (Left on 9/3/2020; right on 5/03/2021); by K.Bawer)

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Solitaire Court stream "restoration", Gaithersburg

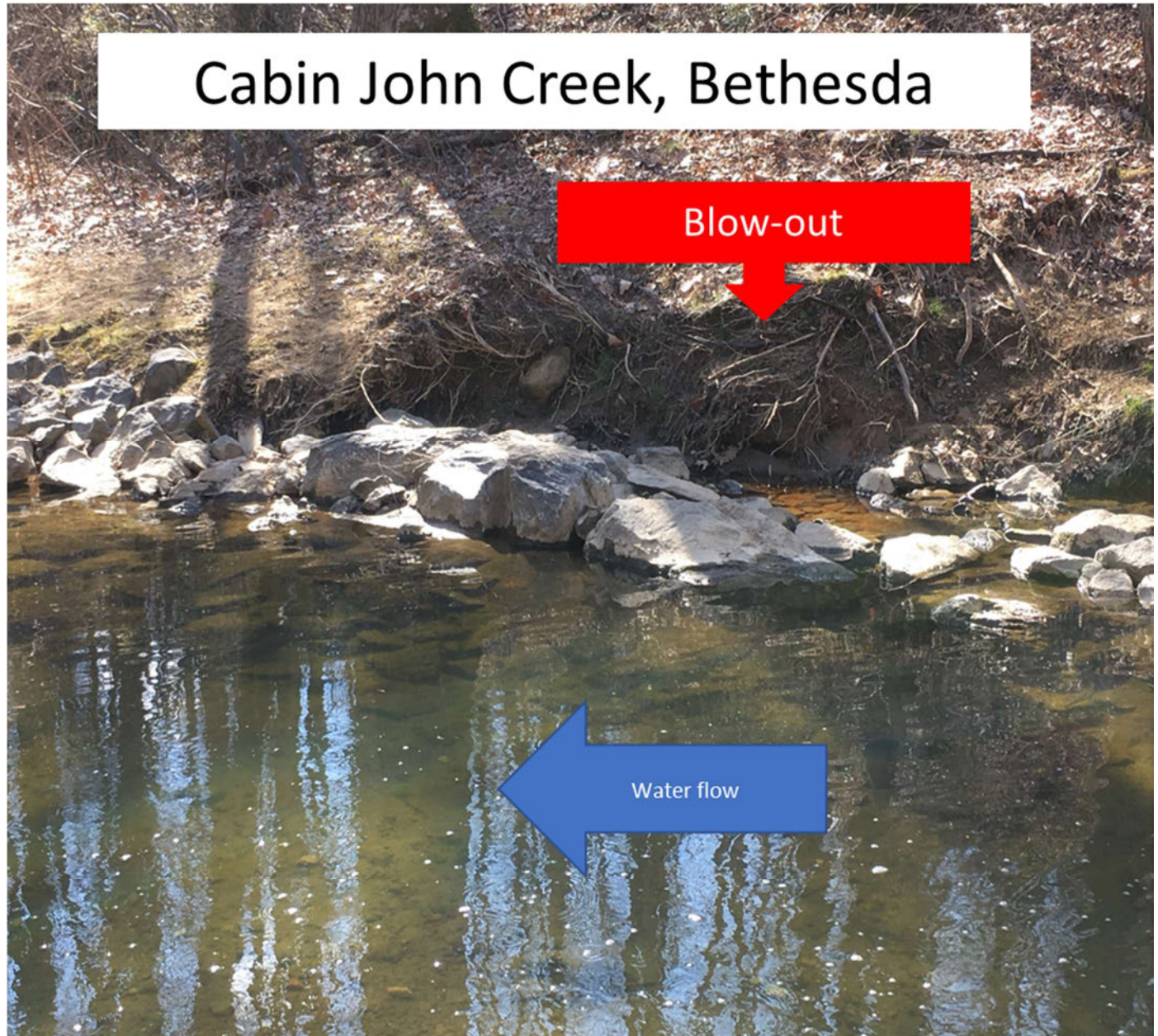


Upper Watts Branch, Rockville



(Stream "restoration" photo by City of Rockville)

Appendix 3: Photos of failed stream “restorations”



Cabin Branch Stream in Cabin John Regional Park (by K. Bawer, 3/19/2021)

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Long Branch, Takoma Park, Md

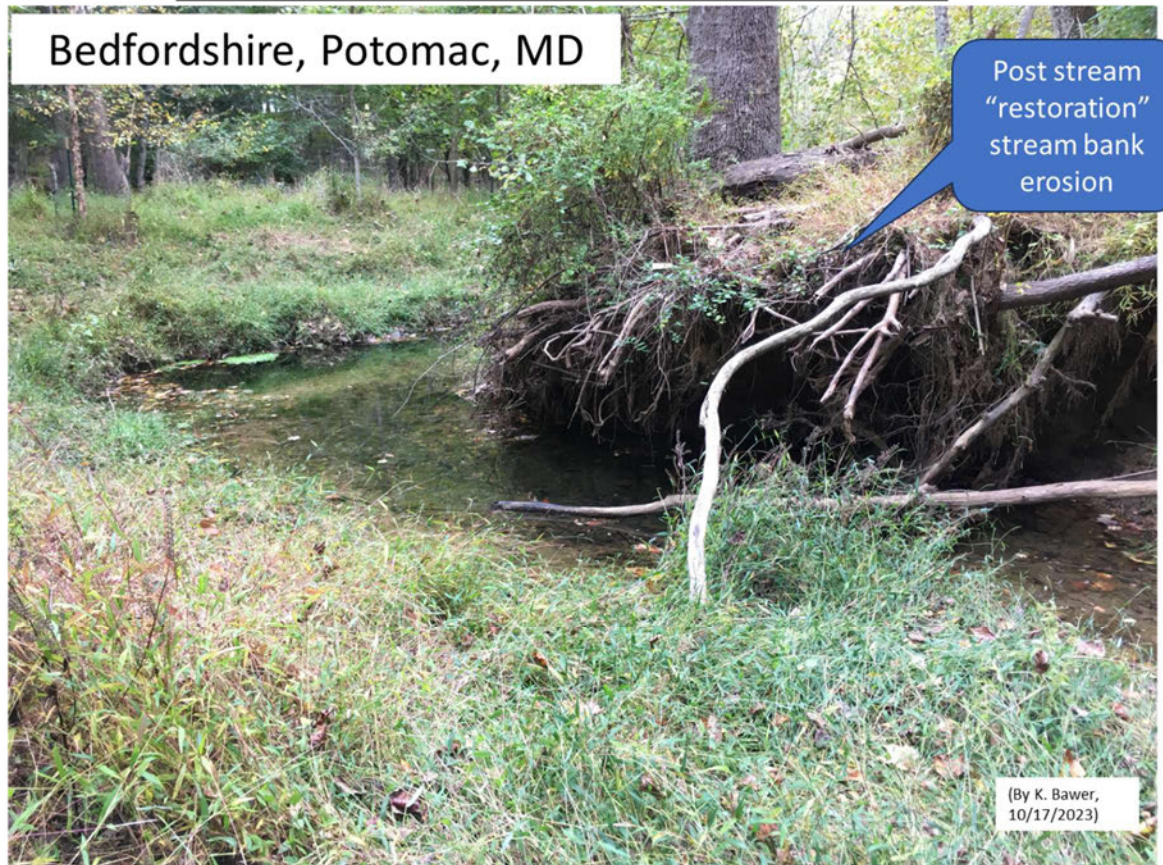


Long Branch, Takoma Park, 10/2/2021 (Photo by K. Bawer)

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Stream “restoration” failures



Stream “restoration” failures.

Old Farm Creek Tributary, North Potomac



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Stream “restoration” failures

Grosvenor Luxmanor Stream “Restoration,” Mo Co



Wildwood Manor, south of I-270

<https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/grosvenor-presentation-wildwood-manor.pdf>

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Stream “restoration” failures



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Appendix 4: Scientific references that show stream “restorations” do not work

Annotated references:

- Analysis of 644 projects by M. Palmer et al., University of MD:

“Improvements in 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 (Table 2).”

“Unfortunately, recovery of biodiversity was rare for the vast majority of stream restoration projects.”

“We show that a major emphasis remains on the use of dramatic structural interventions, such as completely reshaping a channel, despite growing scientific evidence that such approaches do not enhance ecological recovery, and the data we assembled (Table 2) suggest they are often ineffective in stabilizing channels when stability is the primary goal.”

Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” *Annu. Rev. Ecol. Evol. Syst.* 2014. 45:247-269. (<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)
- Analysis of 40 projects by Robert Hilderbrand, University of MD:

“There simply were few ecological differences between restored and unrestored sites. In fact, the unrestored sections upstream [from the restoration sites] were often ecologically better than the restored sections or those downstream of restorations.”

Hilderbrand, Robert H., et. al., 2020, “Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)
- Analysis of 11 streams by Southerland et. al. that were been converted to RSCs (regenerative stormwater conveyances), a type of stream “restoration”

“...fish diversity in RSCs [a type of stream “restoration”] was lower than in high-quality sites....”

“Fish indices of biotic integrity (IBIs) [an industry-standard for measuring in-stream biology] were also lower in RSCs than in high-quality sites....”

Southerland, Mark, et. al., 2021, “Vertebrate Community Response to Regenerative Stream Conveyance (RSC) Restoration as a Resource Trade-Off,” Award: 18002 CBT Restoration Research Grant to Tetra Tech and UMCES-Chesapeake Biological Laboratory; <https://cbtrust.org/wp-content/uploads/FINAL-Report-for-18002-Tetra-Tech-CBL-CBT-RR-Vertebrates-in-RSCs-30SEP2021-Submitted-to-CBT.pdf>
- Analysis of 30 projects by Carr et. al., Drexel University:

“Our analysis of the differences between the ecological condition of restored sites and their paired reference reaches showed that the restored sites consistently scored lower in riparian habitat quality

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as well as the biotic integrity of both periphyton (i.e., attached algae) and benthic macroinvertebrate assemblages. These results clearly demonstrate that at the present time these stream reaches continue to exhibit the types of impaired conditions that originally made them candidates for restoration.”

Carr, J., Hart, D., McNair, J., 2006, “Compilation and Evaluation of Stream Restoration Projects: Learning from Past Projects to Improve Future Success,” The Patrick Center for Environmental Research, The Academy of Natural Sciences of Drexel University, Report Submitted to the William Penn Foundation. <https://ansp.org/research/environmental-research/projects/restoration/>

Additional references:

- Carr, J., Hart, D., McNair, J., 2006, “Compilation and Evaluation of Stream Restoration Projects: Learning from Past Projects to Improve Future Success,” The Patrick Center for Environmental Research, The Academy of Natural Sciences of Drexel University, Report Submitted to the William Penn Foundation. <https://ansp.org/research/environmental-research/projects/restoration/>
- Hilderbrand, Robert H., et. al., 2020, “Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)
- Jepsen, R., Caraco, D., Fraley-McNeal, L, Buchanan, C., and Nagel, A. 2022. “An Analysis of Pooled Monitoring Data in Maryland to Evaluate the Effects of Restoration on Stream Quality in Urbanized Watersheds: Final Report.” ICPRB Report 22-2. Interstate Commission on the Potomac River Basin, Rockville, MD. https://www.potomacriver.org/wp-content/uploads/2022/06/ICP-22-1_Jepsen.pdf
- Kaushal, Sujay S. et. al., 2018, “Tree Trade-offs in Stream Restoration Projects: Impact on Riparian Groundwater Quality,” University of Maryland, State University of New York ESF, Maryland Department of Transportation State Highway Administration, 2018 Presentation (https://cbtrust.org/wp-content/uploads/Kaushal-and-Wood_UMD_061219.pdf)
- Laub, B.G, McDonough, O.T, Needelman, B.A., Palmer, M.A., 2013, “Comparison of Designed Channel Restoration and Riparian Buffer Restoration Effects on Riparian Soils,” Restoration Ecology, Vol. 21, Issue 6, November 2013 (<https://onlinelibrary.wiley.com/doi/abs/10.1111/rec.12010>)
- Palmer, M. A. et. al., 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annual Review of Ecology, Evolution, and Systematics. 2014. 45:247–69 (www.ecolsys.annualreviews.org or www.annualreviews.org)
- Pedersen ML, Kristensen KK, Friberg N, 2014, “Re-Meandering of Lowland Streams: Will Disobeying the Laws of Geomorphology Have Ecological Consequences?” (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4180926/>)

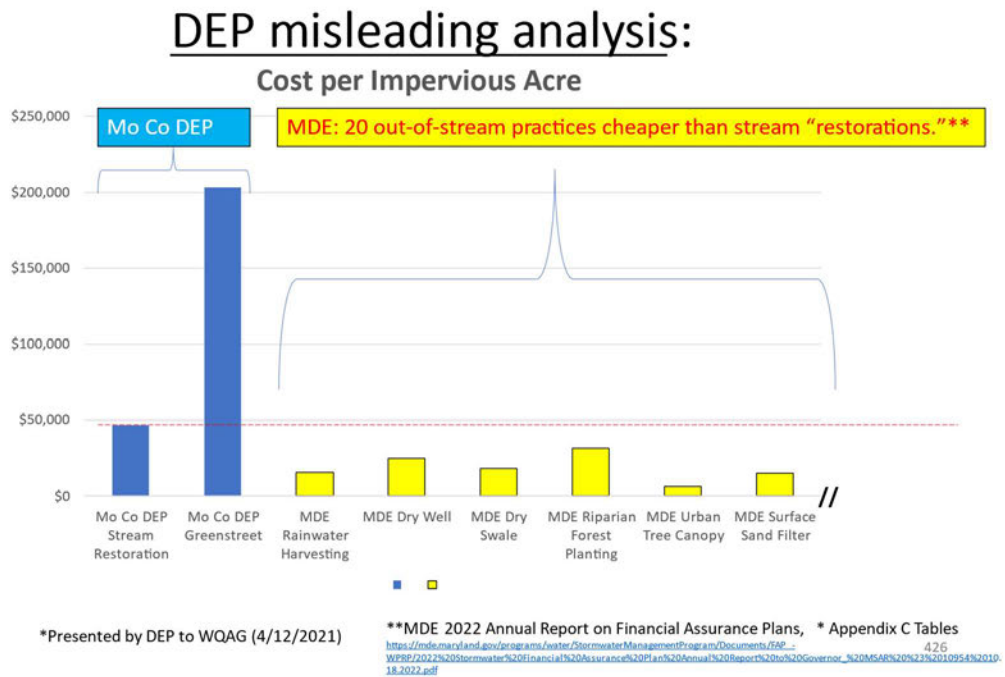
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Appendix 5: Misleading DEP price comparison

DEP uses bogus data to “prove” that stream “restorations” are the cheapest method for MS4 permit credit (they are not).

A modified slide (below) from DEP’s presentation to the Montgomery County Water Quality Advisory Group on 4/12/2021 shows a bar chart where stream “restoration” cost per impervious acre is \$46,886 while Green Streets is \$203,088. The fallacy of this comparison is that the single practice of stream “restorations” is being compared to Green Streets which is actually a DEP program comprised of at least seven different practices including Rain Gardens, Bioretentions, Tree Box Filters, Pervious Sidewalk, Permeable Pavers & Pavement Removal, Curb Extensions, and Grass Swales. DEP does not break out the prices for these seven different practices which is needed for a true comparison between practices. Also, DEP does not show the twenty different practices that the 2022 MDE Annual Report on Financial Assurance Plans (FAPs)⁹ states are cheaper than stream “restorations.” MDE averages the cost data reported from around the state by the various MS4 permit jurisdictions. Shown as yellow bars in the chart below are just some of the twenty practices that are more cost effective than so-called stream “restorations” per the 2022 MDE Annual Report on FAPs.¹⁰



⁹ MDE Annual Report on Financial Assurance Plans, 2022
<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>

¹⁰ Ibid

Coalition to Stop Stream Destruction

Appendix 6: CSSD comments on DEP's response to our call for ban on stream "restorations"

Below are quotes from a 12/19/2024 note from Montgomery County Department of Environmental Protection (DEP) regarding our recent call to ban stream "restorations" followed by our comments:

- "DEP cannot support your call for banning stream restoration. Our decision is based foremost on our use of knowledge, science, and data to improve and adapt our program to ensure protection of the stream riparian resources, and water quality in the County."
 - **FACT:** This is disinformation. DEP has never provided scientific evidence to support their position due to the fact *there is no supporting scientific evidence*. The published science which analyzed over 700 stream "restorations", documentation of washed out projects in Montgomery County, and ground observations of environmental damage (see references and photographs in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) and a [video of the Glenallan stream "restoration"](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>) all lead to the conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. In fact, DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology. There is no scientific basis for continuing the destruction caused by stream "restorations."
- "With data from scientists and engineers over the last 20 years, stream restoration has proven to be effective in addressing stream erosion and sedimentation problems and restoring stream health."
 - **FACT:** This is false. DEP has never provided any published science to prove this false claim. The published science concludes that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology. There is no scientific basis for continuing the destruction caused by stream "restorations."
- "The Maryland Department of the Environment (MDE) and Environmental Protection Agency (EPA) have approved the use of this practice...."
 - **FACT:** DEP disingenuously uses the justification of MDE and EPA approval to GREENWASH and deflect from the fact that stream "restorations" are ineffective per the published science and destructive per our own observations (see references and photographs in the presentation at https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) and a [video of the Glenallan stream "restoration"](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>). Neither MDE nor EPA mandate the use of stream "restorations." Per an EPA letter dated 11/6/2024, "EPA does not direct states or localities on which BMPs [stormwater control projects] are used to reduce pollutant loads...." Note that EPA has approved the use of dirty coal fired

Coalition to Stop Stream Destruction

power plants, but that does not make them environmentally acceptable. As everyone knows, “The right to do something does not mean that doing it is right,” in the words of William Safire.

- “DEP chose to fund the Glenallan project due to erosion complaints....”
 - **FACT: DEP should fund projects based on science, not complaints. In fact, stream “restorations” *do not* stop stream erosion since the source of the problem - uncontrolled stormwater from developed areas that firehoses into streams - is not controlled. Past DEP projects are being washed out by storm events post construction. (see photos in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing).**
- “The Glenallan Tributary suffered from... a stream channel devoid of aquatic habitat.”
 - **FACT: This is FALSE and ridiculous on its face. It shows a misunderstanding of basic ecological principles and terminology. Pre-construction photos from the Public Meeting presentation on October 24, 2017 show various existing aquatic habits along the entire length of the proposed project.**
- “Our technical review of the video you referenced confirms the project is being executed properly with careful protection of trees, best professional techniques for temporary haul roads, and proper placement of rock material to stabilize the stream. Only selective tree removal has occurred....”
 - **FACT: This is typical DEP greenwashing. DEP asks that we not believe our eyes when the [video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>) shows wanton clearcutting of the riparian forest, piles of cut mature trees, a temporary haul road that slices through the forest, and imported rock rubble being haphazardly dumped, not placed, into the stream. The few trees with scrape protectors attached to their trunks will most probably die due to soil compaction of their critical root zones and hydrologic changes caused by heavy construction equipment and tree removal.**
- “During stream restoration projects, every effort is made to improve growing conditions for trees, prioritize healthy and mature trees for retention, and minimize the number of trees removed.”
 - **This is typical DEP greenwashing and Orwellian language. They are saying they must clearcut the stream-side trees in order to improve growing conditions. The way to minimize the number of trees removed is to not cut them in the first place.**
- “In this particular project, extensive non-native invasive plants (NNI) were cleared prior to construction, which is why the video shows cleared areas.”
 - **THIS IS DISINFORMATION. The video shows cleared areas because the forest was clear-cut of ALL plants – mature trees, shrubs, and understory plants along with invasives. Any NNI removal could have been done by hand, not chainsaws and heavy equipment. This is a bogus attempt to justify the project.**

Coalition to Stop Stream Destruction

- “This NNI removal will enable future trees to thrive without competing for resources.”
 - **THIS IS DISINFORMATION.** The county has admitted, and we have seen, that it cannot control the growth of NNIs post-stream “restoration” construction. This can be seen at any county stream “restoration” project such as the one at Falls Reach. These projects disturb large swathes of soil which is a major cause of invasive plant spread.
 - A 10/18/2021 Montgomery County DEP fact sheet about their Falls Reach, Potomac stream “restoration” states “Vegetative cover in the stream riparian area has successfully been reestablished....” However, a site visit on 10/24/2023 showed that four and a half years after project completion in March 2019, the forest floor was overrun with the non-native invasives Japanese Stiltgrass (*Microstegium vimineum*) and Hairy Jointgrass (*Arathroxon hispidus*).
- “Over time, vegetation around a stream restoration project returns, trees grow, and animal/aquatic life abound again.”
 - This is **GREENWASHING** nonsense. DC-area botanist John Parrish (formerly with the National Park Service Center for Urban Ecology, past vice president of the Maryland Native Plant Society, currently serving on the Boards of Conservation Montgomery and the Friends of Ten Mile Creek) has said that after the loss of long-established forest soils, structure and biodiversity, “It will take 100 years or more for a forest to develop soils and structure capable of sustaining a full complement of native plants and animals.”
- “This [stream] erosion causes many problems such as...exposure of sanitary sewers running within the stream bed (a public health concern)....”
 - This is **fearmongering by DEP** which purposely conflates sewer line protection projects with the purpose of a stream “restoration.” Targeted spot hardening of sewer lines in the immediate area of the problem can fix this, unlike the hundreds or thousands of feet of some stream “restorations.”
- “Focusing our efforts solely on upland green infrastructure cannot fix the problems in our streams.”
 - This is easily disproved **DISINFORMATION**. The published science shows that stream “restorations” do not work. The *only* solution is upland (out-of-stream) projects that control stormwater runoff at its source (from roads, parking lots, roofs, etc.) with bioretentions, permeable pavement, rain gardens and many other practices. In the past, DEP has referenced papers to incorrectly conclude that upland green infrastructure cannot stop stream erosion. However, the proper conclusion from those papers is simply that *not enough* upland projects were done to keep stormwater from firehosing into streams.
- “We have many highly developed areas in the county and finding locations for green infrastructure in these areas sufficient in size and expanse is challenging with numerous constraints.”
 - **THIS IS MISLEADING:** First, DEP does not even do these types of alternative analyses for every proposed stream “restoration” project. For example, DEP never did an upland alternative analysis for the Falls Reach project or the scheduled Grosvenor stream “restoration.” Second, DEP has never proven, because it can’t, that the

Coalition to Stop Stream Destruction

county's MS4 permit cannot be met unless stream "restorations" are done. DEP's rationale for stream "restorations," aside from their false claims about stream "restoration" benefits, is that it is more convenient to sacrifice our natural areas to stream construction projects than to take on the "challenge" of controlling stormwater outside of streams. What is particularly egregious is that Maryland Department of the Environment (MDE) has statewide data from its 2022 Annual Report on Financial Assurance Plans (FAPs) showing there are 20 non-destructive, out-of-stream stormwater project types that are more cost effective than stream "restorations." This waste may be of interest to the Montgomery County Office of the Inspector General whose website (<https://www.montgomerycountymd.gov/oig/hotline.html>) defines waste as "The careless expenditure of county funds or resources above and beyond the level that is reasonably required to meet the needs of the county...." They give examples include buying excessive goods or services and inefficient use of resources.

- "We know that stream restoration is beneficial for habitat improvements, to protect private property and utility infrastructure, and to reduce in-stream erosion and sedimentation."
 - **THIS IS DISINFORMATION.** DEP chooses to ignore the science, observations of their washed out projects, and common sense. The published science and ground observations conclude that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. DEP has never provided any published science to support their false claims about the benefits of stream "restorations." DEP continues to falsely conflate utility infrastructure (e.g. sewer line) protection projects with the definition of a stream "restoration" to justify their projects.

Coalition to Stop Stream Destruction

Appendix 7: CSSD response to Montgomery Parks' 1/10/2025 letter opposing a stream "restoration" ban

(January 17, 2025)

Montgomery Parks and Department of Environmental Protection (DEP) have lost all credibility given their numerous bogus claims about stream "restoration" benefits. But do not take our word for it. Read for yourself Parks' greenwashing comments (below) in their 1/10/2025 letter along with our comments in response. You can also read [DEP's greenwashing comments](#)¹¹ in their 12/19/2024 response to our call for a ban. Hopefully you will be shocked or disgusted enough to [send a note](#) asking that stream "restorations" be banned like fracking was banned in the state of Maryland.

Unfortunately, neither the Montgomery County Executive, the County Council, or other elected officials at the state (with a few brave exceptions) or federal level have taken our request to ban stream "restorations" seriously or even asked any questions. For example, one response stated that "...stream restoration efforts, which incorporate the thoughtful use of rocks and native plants, are so important in preventing erosion and protecting these essential resources." Apparently, they only believe the false information from Parks and DEP and did not read, or did not believe, our scientific references or the videos and photographic evidence.

Meanwhile, the destruction of our streams continues. If you want a good cry and to see what our elected officials apparently did not take the few minutes to view, watch the short [video of the Glenallan stream "restoration"](#)¹² near Brookside Gardens. Parks' and DEP's comments are quite Orwellian given what is shown in the video - we are being asked reject the evidence of our eyes.

If our elected officials believe this is a restoration, then maybe we can sell them the Brooklyn Bridge or some swampland in Florida. Please take a moment to [click here](#) to urge officials to stop these horrible projects. Why are they continuing? We can't figure it out.

It is quite sad that the natural resources stewardship philosophy of local, state (with a few notable exceptions), and federal elected officials plus Montgomery Parks, Montgomery County DEP, Maryland Department of the Environment (MDE), Maryland Department of Transportation (MDOT) State Highway Administration (SHA), Environmental Protection Agency (EPA), and the U.S. Army Corps of Engineers (USACE) is apparently, "We have to kill the patient to save the patient." This is not hyperbole given the responses from both Parks ([read details below](#)) and [DEP](#) to our call for a ban on stream "restorations" and the fact that the above mentioned agencies actually permit this destruction.

In the Montgomery Parks' letter dated January 10, 2025, Parks, like DEP, tries to greenwash away the harm done by these very destructive projects using disinformation, provably false information, and misleading information. Parks and DEP, and apparently most of our elected officials, think they can pat us on the head and hope that we will just go away. It is disastrous for future generations that Parks, DEP,

¹¹ https://drive.google.com/file/d/1-e85ZiQfYBrySjswPgk61dnJlxTwYmMw/view?usp=drive_link

¹² Video of the Glenallan stream "restoration" near Brookside Gardens at <https://www.youtube.com/watch?v=91O2bAdT8PY>

Coalition to Stop Stream Destruction

and our elected officials are failing to do their job to protect our natural resources. They are all active agents in the destruction of our natural resources.

It is bad enough that these destructive projects are being foisted upon an unsuspecting public. But what adds insult to injury is the shameless greenwashing about their supposed benefits (think “clean coal”). This appears to be a clear case of waste, fraud, and abuse.

Among the many falsehoods and claims by Parks which are debunked in this document below are the following:

- Parks falsely claims that stream “restoration” is “a science-backed practice recognized ...to provide both water quality and ecological benefits.”
- Parks falsely claims that “These projects have been shown to improve water quality, reduce erosion... and enhance habitat,” among other claims.
- Parks falsely implies that stream “restorations” are *required* to meet TMDL and MS4 permit requirements.
- Parks falsely claims that “stream restoration projects involve temporary disturbances” rather than permanent or long-term ones.
- Parks claims to “conduct post-construction monitoring of our completed projects,” yet no results are publicly available on their web sites.
- Parks fails to acknowledge that the published scientific literature shows that stream “restorations” do not stabilize streams, improve water quality, or improve ecological function.
- Parks and their partners in DEP fail to act on the knowledge that stream “restorations” do not stop the root cause of stream erosion - uncontrolled stormwater from developed areas that firehoses into streams.
- Parks falsely claims that they have the full support of all adjacent property owners.
- Parks falsely implies that because the project was permitted, that doing it is the right thing.
- Parks falsely claims that tree removal was minimal and that the remaining trees were adequately protected.
- Parks falsely claims that they constructed “haul roads that weave through the existing forest.”
- Parks falsely implies that this project will have a successful invasives management plan, when they cannot even control invasives in other park lands.
- Parks falsely implies that “a robust planting plan” will mitigate the damage done by clearcutting the original forest.
- Parks fails to disclose that the “geotextile materials” being used is actually plastic sheeting which will break down into microplastics when it is washed-out and exposed to light.

It would reasonable to conclude, after reading [Parks’ letter](#) (below) and [DEP’s comments](#) that either they have never been on site at Glenallen or they are hoping that no concerned residents ever visit the site or investigate the facts about stream “restorations” to refute their greenwashing and disinformation. Parks’ and DEP’s continued repetition of false assertions does not make them true.

XX

Coalition to Stop Stream Destruction

CSSD response to Montgomery Parks 1/10/2025 letter opposing a stream “restoration” ban

Below are quotes from the Montgomery Parks letter dated 1/10/2025 in response to our recent call to ban stream “restorations” followed by our comments in **bold**:

“As stewards of over 600 miles of streams that provide valuable habitat for wildlife and recreational opportunities for residents, Montgomery Parks implements a stream restoration program intended to restore degraded stream channels and protect adjacent properties and public infrastructure.”

- **RESPONSE:** We wish that Parks would exercise their stewardship in a more responsible manner. Parks’ stated intention is to “restore degraded stream channels and protect adjacent properties and public infrastructure,” but the scientific literature and observations throughout the county¹³ show that stream “restorations” do not stabilize streams, improve water quality, or improve ecological function. Parks conflates stream “restorations” ostensibly done for the benefit of streams with infrastructure and property protection projects. This is a common ploy, the same one used by DEP, to disingenuously justify doing a stream “restoration.” It uses fearmongering to blur sewer line protection projects with the purpose of a stream “restoration.” Targeted spot hardening of sewer lines can be done in the immediate area of the erosion problem – this does not justify the hundreds or thousands of feet of some stream “restorations (1500 linear feet in the case of the Glenallan Tributary between Georgian Woods Place and Glenallan Avenue).

“Stream restoration is a highly regulated, science-backed practice recognized by the Environmental Protection Agency (EPA) and Maryland Department of the Environment (MDE) to provide both water quality and ecological benefits.”

RESPONSE: It is false to say that stream restoration is a “science-backed practice.” In fact, it is an engineering practice¹⁴ that is promoted by the \$25 billion industry and others (including non-profits) seeking financial gain.

To say that EPA and MDE recognize this practice (in the form of issuing permits) is a common red herring used to justify stream “restorations” that never should have been constructed. As everyone knows, “The right to do something does not mean that doing it is right,” in the words of William Safire.

¹³ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

¹⁴ For example, see “Stream Restoration Design,” National Engineering Handbook, Part 654, August 2007, United States Department of Agriculture, Natural Resources Conservation Service, Case Study 6, p. CS6–13

Coalition to Stop Stream Destruction

The published science¹⁵ does not back or support the use of stream “restorations.” The science concludes that stream “restorations” provide neither water quality or ecological benefits.

To justify a stream “restoration,” the public is told that erosion is a huge problem. If the industry or jurisdiction says that a stream needs to be “restored” because it is actively eroding, is that true? And even if true, what is the actual rate of erosion (which is used to garner MS4 permit credits)? The only reliable way to prove that there is active erosion is to make physical measurements at the same site over time. One method is to drive steel rods into the stream bank horizontal to the ground and measure the rate at which the rod becomes exposed over time. This is virtually never done because companies do not want to spend the time it takes to do these measurements. What they use, and what MDE and USACE (the permitting agencies) should disallow, are theoretical, mathematical calculations using the BANCS method¹⁶ to estimate the supposed rate of erosion.

Rather than physical measurements of erosion amount over time, the state and jurisdictions almost universally rely on theoretical mathematical calculations of erosion rates as documented in a Chesapeake Bay Expert Panel Report.¹⁷ However, this report states that these theoretical calculation tools are “...susceptible to high variability when performed by different practitioners in the field.” If a measurement cannot be reproduced by different people using the same methodology, it is scientifically worthless. But virtually no companies do boots-on-the-ground actual measurements over time because they say it takes too long. On top of that, the Expert Panel is so unsure of the whole BANCS estimation methodology that they take the BANCS theoretical estimate of erosion rate (which they translate into rate of nitrogen, phosphorous and sediment pollution from eroding stream banks) and randomly cut it by 50%. This puts the lie to the veracity of stream erosion claims using theoretical calculations. If a stream erosion rate cannot be proven using traditional physical measurements, a proposed stream “restoration” should not qualify for MS4 permit credits nor should it qualify as a mitigation site.

---- More details below ----

For MS4 permits, the stream “restoration” crediting methodology is fatally flawed. MDE defers to, and uses, the Chesapeake Bay Program Expert Panel Report for Protocol 1 Guidance” on this matter.¹⁸

The first problem is that these reports were not created by an independent panel of scientists with no financial conflicts of interest. The CBP Expert Panel included employees of for-profit engineering companies who are primarily engineers, not scientists, and who may have had a

¹⁵ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024 - see scientific references in presentation.

¹⁶ 2019 Protocol 1 Guidance: “Consensus Recommendations for Improving the Application of the Prevented Sediment Protocol for Urban Stream Restoration Projects Built for Pollutant Removal Credit,” p. 23; Full Report: <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

¹⁷ Ibid

¹⁸ 2019 Protocol 1 Guidance: “Consensus Recommendations for Improving the Application of the Prevented Sediment Protocol for Urban Stream Restoration Projects Built for Pollutant Removal Credit,” p. 23; Full Report: <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

Coalition to Stop Stream Destruction

vested interest in ensuring that the crediting calculations maximized their profits. This has the appearance of a conflict of interest and has, at a minimum, the appearance of impropriety. As such, the use of these Expert Panel reports by MDE is arguably a corrupt process. It fails the “reasonable person” test.

The second problem is that the Expert Panel report allows the use of the BANCS method, a theoretical calculation, to estimate the rate of stream bank erosion. Per the report:

“The most common technique to estimate bank erosion rate is the BANCS Method (Rosgen, 2001), where field surveys are used to calculate BEHI and NBS scores, which in turn, are entered into regional bank erosion curves to determine the annual rate of streambank retreat.” (emphasis added).

Stream bank erosion rate is a critical variable in calculating the MS4 permit credits to be awarded. But the report states that these theoretical calculation tools are “...susceptible to high variability when performed by different practitioners in the field.” (emphasis added). If a measurement cannot be reproduced by different people using the same methodology, it is scientifically worthless. If used, it is arguably fraudulent if used to prove that a stream is eroding to justify a stream “restoration” project and garner MS4 permit credits.

The only accurate method to determine geomorphic evidence of active stream degradation is actual boots-on-the-ground, long-term measurements of bank erosion by traditional, fixed-station methods, such as bank pin monitoring.

Per the report, stream “restoration” companies may, in fact, use direct physical measurements to determine erosion rates:

“Designers also have the option to directly measure the rate of bank retreat in the project reach using bank pins, cross section surveys or other alternative methods that were not explicitly defined in the original expert panel report.”

However, direct measurement to determine erosion rates is not a requirement. In fact, virtually no stream “restoration” companies do boots-on-the-ground actual measurements over time because it takes too long. Being profit-driven, the theoretical estimation method saves companies time and money.

On top of that, the Expert Panel itself is so skeptical of the BANCS estimation methodology that they take its estimate of erosion rate (which is translated into pollution reduction when a stream “restoration” is done to determine the MS4 permit credits for a project) and randomly cut that by 50%. This should cause a huge amount of concern as to the veracity of stream erosion claims made using theoretical modeling. The current Expert Panel erosion-rate calculations are basically a thought experiment that should not be a substitute for actual on-site physical measurements.

If the actual erosion rate based on physical measurement is much less than the theoretical methodology indicates, that would make stream “restorations” less attractive for MS4 permit

Coalition to Stop Stream Destruction

projects since they would be awarded less nitrogen, phosphorous, and suspended sediment credits.

Included in the Protocol 1 Guidance is this damning “Pennsylvania DEP Position on The Use of the BANCS Method”:

“These memo recommendations are advisory and the appropriate state and federal permitting agencies reserve the authority to decide how to handle stream restoration projects using Protocol 1. The Pennsylvania Department of Environmental Protection (PADEP) continues to have substantial concerns regarding the development and application of BANCS methods for stream restoration crediting purposes in all hydrogeomorphic regions. One of their primary concerns is the use of BANCS methods within the Chesapeake Bay Watershed where BANCS relationships have not been appropriately validated and data is limited. They are also concerned that BANCS relationships developed using short-term monitoring-intervals may not produce valid results for reduction crediting.”

“These projects have been shown to improve water quality, reduce erosion, protect infrastructure, increase surface and groundwater interactions, manage channel hydraulics, and enhance habitat,”

RESPONSE: This is disinformation. First, Parks is also conflating stream “restorations” with infrastructure protection projects in an attempt to justify these projects. Infrastructure protection projects do not qualify for EPA or MDE TMDL or MS4 permit credits. Neither Parks, DEP, MDE, or EPA has provided scientific evidence to support their assertion that these projects improve water quality, reduce erosion, and enhance habitat due to the fact *there is no supporting scientific evidence*.

Certainly, everyone promoting and approving stream “restorations,” including Montgomery Parks, Montgomery County DEP, MDE, Maryland Department of Transportation (MDOT) State Highway Administration (SHA), Environmental Protection Agency (EPA), and the U.S. Army Corps of Engineers (USACE) is familiar with the published scientific literature showing that these projects do not work to either stabilize streams or improve the ecology. It appears that stream “restoration” proponents are either ignorant of the science or simply choose to ignore the science. One wonders about the role of the \$25 billion stream restoration industry.

Some of the scientific evidence that stream “restorations” do not work includes:

- Palmer et al.’s meta-analysis of 644 projects which said, “We show that a major emphasis remains on the use of dramatic structural interventions, such as completely reshaping a channel, despite growing scientific evidence that such approaches do not enhance ecological recovery, and the data we assembled (Table 2) suggest they are often ineffective in stabilizing channels when stability is the primary goal.”¹⁹ They also showed that water quality does not improve, that biology does not improve, and that ecology does not improve.

¹⁹ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269.
(<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

Coalition to Stop Stream Destruction

- Hilderbrand's meta-analysis of 40 Natural Channel Design (NCD)- and Regenerative Stormwater Conveyance (RSC)-type projects that concluded, "There simply were few ecological differences between restored and unrestored sites. In fact, the unrestored sections upstream [from the restoration sites] were often ecologically better than the restored sections or those downstream of restorations."²⁰
- Carr et. al.'s meta-analysis of 30 projects concluding that the ecology did not improve.²¹
- Southerland et. al.'s analysis of 11 streams in Anne Arundel County showing that the biology did not improve.²²
- Stowe et. al.'s analysis of results from 23 projects that concluded that stream "restoration" produces only transitory, not permanent, changes to abundance and species richness of fishes, especially to sensitive taxa and in urban systems.²³

In addition, Montgomery County Department of Environmental protection has admitted that none of their past 56 projects²⁴ starting in 1992 improved stream ecology.²⁵ This begs the question as to why "Parks is implementing the Glenallan Tributary project on behalf of DEP" if both DEP and Parks knows it will fail?

Some might say they have seen an article or have anecdotal evidence showing that a particular restoration project worked or was "magical." First, this isn't about aesthetics - this is about protecting our natural areas and their functioning ecosystems. Second, it would not be surprising if the occasional project was successful in terms of nitrogen, phosphorous, and sediment reduction, and maybe even biological uplift. But the meta-analyses of over 700 projects (see references in the presentation

https://drive.google.com/file/d/1dos8SmOF5_evul8Y_CWuUMVNHZoVP1Sf/view?usp=sharing

²⁰ Hilderbrand, Robert H., et. al., 2020, "Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland," Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

²¹ Carr, J., Hart, D., McNair, J., 2006, "Compilation and Evaluation of Stream Restoration Projects: Learning from Past Projects to Improve Future Success," The Patrick Center for Environmental Research, The Academy of Natural Sciences of Drexel University, Report Submitted to the William Penn Foundation. <https://ansp.org/research/environmental-research/projects/restoration/>

²² Southerland, Mark, et. al., 2021, "Vertebrate Community Response to Regenerative Stream Conveyance (RSC) Restoration as a Resource Trade-Off," Award: 18002 CBT Restoration Research Grant to Tetra Tech and UMCES-Chesapeake Biological Laboratory; <https://cbtrust.org/wp-content/uploads/FINAL-Report-for-18002-Tetra-Tech-CBL-CBT-RR-Vertebrates-in-RSCs-30SEP2021-Submitted-to-CBT.pdf>

²³ Stowe, Edward S., Petersen, Kelly N., et. al., 2023, "Stream restoration produces transitory, not permanent, changes to fish assemblages at compensatory mitigation sites," Restoration Ecology, Volume 31, Issue 5, Jul 2023, <https://onlinelibrary.wiley.com/doi/10.1111/rec.13903> and <https://onlinelibrary.wiley.com/doi/epdf/10.1111/rec.13903>

²⁴ Montgomery County, Maryland Department of Environmental Protection, Watershed Restoration Projects, <https://apps2.montgomerycountymd.gov/MCGSPAApps/Project.aspx?id=2>, searched on "stream restoration" for COMPLETED projects.

²⁵ Montgomery County Department of Environmental Protection presentation to Stormwater Partners Network on January 16, 2024. "We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations." BMIs are a standard measure of stream health.

Coalition to Stop Stream Destruction

g) show that any successful projects are outliers - the rare exception rather than the rule. It is the rule that establishes the science, not the one-offs.

Finally, photographic documentation of washed-out projects in Montgomery County and other locations in Maryland (see photographs in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) lead to the conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function.

Neither Montgomery Parks, DEP, MDE, MDOT SHA, EPA, or USACE has provided any significant evidence to the contrary from the published literature. Parks has not posted to their web site any results of their stream “restorations” to back up their assertions. Thus, there is no scientific basis for continuing the destruction caused by stream “restorations.”

“These projects have been shown to improve water quality, reduce erosion, protect infrastructure, increase surface and groundwater interactions, manage channel hydraulics, and enhance habitat, and thus meet regulatory requirements such as Total Maximum Daily Load (TMDL) reductions and Municipal Separate Storm Sewer System (MS4) permits.”

COMMENT: Parks’ false implication is that stream “restorations” are *required* to meet TMDL and MS4 permit requirements. Neither MDE nor EPA mandate the use of stream “restorations.” Per an EPA letter dated 11/6/2024, “EPA does not direct states or localities on which BMPs [stormwater control projects] are used to reduce pollutant loads....”²⁶ The same is true of MDE.

The fact is that more than enough out-of-stream upland locations are available to construct enough stormwater control projects to meet TMDL and MS4 permit requirements. Any statements to the contrary by Parks and DEP have never been supported by credible evidence.

“...stream restoration projects involve temporary disturbances...”

COMMENT: This is greenwashing nonsense. Parks should be ashamed to put forth such a statement. The implication of a “temporary” disturbance is one which goes away at the conclusion of construction. For example, a staging area that is removed and returned to pre-construction conditions.

Stream “restoration” projects are *not* temporary disturbances. DC-area botanist John Parrish (formerly with the National Park Service Center for Urban Ecology, past vice president of the Maryland Native Plant Society, currently serving on the Boards of Conservation Montgomery and the Friends of Ten Mile Creek) has said that after the loss of long-established forest soils, structure and biodiversity, “It will take 100 years or more for a forest to develop soils and structure capable of sustaining a full complement of native plants and animals.”²⁷

²⁶ Personal communication to K. Bawer.

²⁷ Public Hearing Testimony to the Montgomery County Council, RE: Bill 25-22 Forest Conservation – Trees (Oct. 4, 2022 Public Hearing), by John Parrish

Coalition to Stop Stream Destruction

Palmer et al. (2014)²⁸ says, “Unfortunately, recovery of biodiversity was rare for the vast majority of stream restoration projects.”

Laub et al. (2013)²⁹ state that, “These results indicate that compaction and disturbance of riparian soils may be a significant unintended consequence of designed channel restoration and can persist for at least a decade.”

Once the project is completed, the loss of tree cover will lead to an increase in stream temperatures which is detrimental to sensitive fish and other aquatic organisms.

Loss of tree canopy from this stream “restoration” will increase air, water, and noise pollution, and increase heat stress by creating a heat corridor. Destroying the tree canopy exacerbates the impact of climate change. Stream “restoration” projects adjacent to residential areas remove trees which decreases property values.

“Montgomery Parks (Parks) takes pride in leading the industry in deploying strategies that minimize impacts at restoration sites.”

COMMENT: Parks and DEP use this same greenwashing strategy taking a cue from the oil industry. This is a red herring that deflects from the fact that these stream “restorations” should not be done in the first place. The objective should not be to *minimize* impacts – the objective should be to avoid *impacts*.

One has only to view the video of the Glenallan project³⁰ to realize that Parks’ “strategies that minimize impacts at restoration sites” is obviously not true. Parks would have us not believe our eyes.

“Furthermore, Parks uses scientifically established protocols to conduct post-construction monitoring of our completed projects over several years to evaluate the system’s response, with reduced erosion from stabilized bed and banks and improved habitat connectivity, quality, and availability both within the stream and in riparian areas as priority project goals.”

COMMENTS: While these may be the goals, Parks has never published the results of their stream “restorations,” so Parks is asking the public to “trust us.” Parks should post their results on their web site for public review.

²⁸ Palmer, M. A., K. L. Hondula, and B. J. Koch, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” *Annu. Rev. Ecol. Evol. Syst.* 2014. 45:247-269;
<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>

²⁹ Laub, B.G, McDonough, O.T, Needelman, B.A., Palmer, M.A., 2013, “Comparison of Designed Channel “restoration” and Riparian Buffer “restoration” Effects on Riparian Soils,” “restoration” Ecology, Vol. 21, Issue 6, November 2013 (<https://onlinelibrary.wiley.com/doi/abs/10.1111/rec.12010>)

³⁰ [Video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>)

Coalition to Stop Stream Destruction

However, Park's results are arguably a moot point. What we already know is this – that the following sources all lead to the unavoidable conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function:

- the published science which analyzed over 700 stream “restorations”³¹
- documentation of washed-out projects in Montgomery County and other areas in the state plus ground observations of environmental damage³²
- a video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>)
- a video of the Solitaire Court stream “restoration” in Gaithersburg (<https://www.youtube.com/watch?v=NvTvPnG6Qs8>).
- Montgomery County DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology.³³ Unlike Parks, at least some of DEP's results are available on the web.

It would not necessarily be surprising if some projects are shown to be successes in terms of nitrogen, phosphorous, and sediment reduction, and maybe even biological uplift. But the current research proves that they would be outliers - the rare exceptions rather than the rule. Science is not based on statistically insignificant exceptions.

“While some benefits of stream restoration can be readily observed, such as improved bank vegetation, aeration along riffles, and pool habitat, biological function improvements are much more difficult to recognize.”

COMMENT: This is disinformation. Observations of stream “restoration” projects such as videos of the Glenallan stream “restoration”³⁴ and the Solitaire Court project³⁵ show the destruction wrought by these projects.

Stream “restorations” are major engineering construction projects that attempt to stabilize eroding streams using heavy equipment. This usually requires cutting large numbers of trees for construction equipment access and may involve a mix of straightening a stream, digging an unnatural meander pattern, dumping heavy boulders on top of plastic sheeting to armor sections of a stream bank, scraping away stream bank and forest soil, dumping imported fill material into a stream channel, digging out a new channel in a different location, and dumping rocks into the stream to create a series of low dams that block the movement of aquatic organisms.

³¹ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evu8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

³² Ibid

³³ Montgomery County Department of Environmental Protection presentation to Stormwater Partners Network on January 16, 2024. “We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations.” BMIs are a standard measure of stream health.

³⁴ Video of the Glenallan stream “restoration” near Brookside Gardens at <https://www.youtube.com/watch?v=91O2bAdT8PY>

³⁵ Video of the Solitaire Court stream “restoration” in Gaithersburg” at <https://youtu.be/NvTvPnG6Qs8>

Coalition to Stop Stream Destruction

Proponents of stream “restorations” greenwash these projects by hiding from the public and elected officials the fact that these projects result in the destruction of countless trees, understory plants, forest soils, and animals.

In addition, proponents minimize the impact of clearcutting forests and grading forest floors down to bare earth during a stream “restoration” by claiming that it will only be a “temporary disturbance” and that tree loss will be “minimized.” This is a deliberate attempt to minimize public scrutiny and opposition and to gain the support of elected officials. For example, a City of Gaithersburg web site for the Solitaire Court stream “restoration” stated that “It will take a year or two for the park to fully revegetate,” and “It is expected that terrestrial wildlife and some of the aquatic species will move away from the area when the construction equipment arrives. Wildlife normally returns to the area once the construction is over.” These statements raise greenwashing to an art form.

Stream “restorations” convert sections of natural stream valleys into engineered stormwater management projects. They create “Frankenstreams” – engineered abominations that are never found in nature with artificial meanders, unnatural rock dams, stream channels filled with dumped rubble, channels that are moved to a new location, and stone-armored banks.

The negative impacts of stream “restorations” from these construction projects include tree loss, ecosystem services loss, and increased stream temperature which decreases stream health. Stream “restorations” do not prevent pollutants in urban areas such as road oil and salt, lawn pesticides and fertilizer, toxic tire dust, pet waste, and trash from washing into streams where they are harmful to humans as well as the plants and animals.

Stream “restorations” done with the floodplain reconnection method (Parks calls this improving “floodplain interaction”) increase the frequency and duration of local flooding by design. But causing a floodplain to flood more frequently can water-log the floodplain like a wet sponge. The addition of more flood water during subsequent storms to the already saturated soil results in the additional water simply flowing off the floodplain, possibly creating flooding problems for adjacent property owners or downstream. Floodplain reconnection also increases mosquito habitat when the receding water leaves behind pools of stagnant water. And floodplain reconnection leads to the death of existing trees that are not adapted to water-logged soil.

Parks assertion that “biological function improvements are much more difficult to recognize” is due to the fact that scientific research shows that it *does not happen*. As documented above, the published literature, photographic documentation of washed-out projects, and on-site observations of environmental damage lead to the conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function.

“Because these streams were degraded by upstream development over many years, it takes time for restored reaches to fully achieve their new ecological potential and biological community improvements will be slowed by recolonization barriers across the urban landscape where these projects are being implemented.”

Coalition to Stop Stream Destruction

COMMENTS: We agree that the degradation of streams was caused by uncontrolled stormwater runoff from development. But the fact is that stream “restorations” *do not* stop stream erosion since the source of the problem - uncontrolled stormwater from developed areas that firehoses into streams - is not controlled by constructing stream “restorations.” This is the reason that past projects are being washed out by storm events post-construction. (see photos from Montgomery County and other locations in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing).

The following examples show the great expense of repairing stream “restoration” failures which should make them a financially less attractive stormwater control practice:

- Lower Booze Creek, Potomac, MD: repair cost \$3.6M³⁶
- Grosvenor Luxmanor: repair cost scheduled for \$4.8M per MoCo DEP³⁷
- Old Farm Creek Tributary in North Bethesda: repair cost scheduled for \$800K per MoCo DEP³⁸

Parks would have us be patient since they say that “it takes time for restored reaches to fully achieve their new ecological potential.” But there is abundant published scientific evidence to the contrary, which analyzed over 700 stream “restorations” and concluded that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. See references above to the work of Palmer, Hilderbrand, Carr, Southerland, and Stowe. In addition, Montgomery County Department of Environmental protection has admitted that none of their past 56 projects³⁹ starting in 1992 improved stream ecology.⁴⁰ How much time would Parks have us wait for results while they charge ahead each year with new stream “restorations.” We suggest that Parks wait for the results of their already completed projects before claiming success in the absence of data. (Maybe Parks has this data, but it is not publicly accessible on their web sites).

DC-area botanist John Parrish (formerly with the National Park Service Center for Urban Ecology, past vice president of the Maryland Native Plant Society, currently serving on the Boards of Conservation Montgomery and the Friends of Ten Mile Creek) has said that after the loss of long-established forest soils, structure and biodiversity, “It will take 100 years or more

³⁶ Per DEP, <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Presentation.pdf>

³⁷ <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/grosvenor-presentation-wildwood-manor.pdf>

³⁸ <https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/restoration/oldfarm-creek-neilwood/WRE12-26%20Old%20Farm%20Creek%20Public%20Meeting%20Presentation%20Final.pdf>

³⁹ Montgomery County, Maryland Department of Environmental Protection, Watershed Restoration Projects, <https://apps2.montgomerycountymd.gov/MCGSPApps/Project.aspx?id=2>, searched on “stream Restoration” for COMPLETED projects.

⁴⁰ Montgomery County Department of Environmental Protection presentation Stormwater Partners Network on January 16, 2024. “We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations.” BMIs are a standard measure of stream health.

Coalition to Stop Stream Destruction

for a forest to develop soils and structure capable of sustaining a full complement of native plants and animals.”

Parks says that “it takes time for restored reaches to fully achieve their new ecological potential.” But Parks has never posted on their web sites any results of their stream “restorations” to back up their assertions.

Glenallan Tributary Project Overview

“Because your email cites our ongoing project at the Glenallan Tributary as a negative example of stream restoration, I would like to address this project in detail.”

“Glenallan Tributary was first identified as a potential restoration project by the DEP a decade ago. It originated as a drainage complaint from adjacent neighbors concerned about private property loss. While investigating the complaint, Parks and DEP staff identified actively eroding banks, streamside tree loss, poor in-stream and riparian habitat quality, and an abundance of non-native invasive (NNI) plant species. Further biological investigations by Parks using Maryland Biological Stream Survey protocols revealed that the degraded stream did not support a viable aquatic ecosystem and pre-restoration in-stream biological monitoring rated the benthic macroinvertebrate community as “Poor,” the lowest possible category.

COMMENT: What Parks neglects to mention is that the published scientific literature shows that stream “restorations” do nothing to improve any of the above-mentioned conditions.

Some of the scientific evidence that stream “restorations” do not work includes:

- **Palmer et al.’s meta-analysis of 644 projects which said, “We show that a major emphasis remains on the use of dramatic structural interventions, such as completely reshaping a channel, despite growing scientific evidence that such approaches do not enhance ecological recovery, and the data we assembled (Table 2) suggest they are often ineffective in stabilizing channels when stability is the primary goal.”⁴¹ They also showed that water quality does not improve, that biology does not improve, and that ecology does not improve.**
- **Hilderbrand’s meta-analysis of 40 Natural Channel Design (NCD)- and Regenerative Stormwater Conveyance (RSC)-type projects that concluded, “There simply were few ecological differences between restored and unrestored sites. In fact, the unrestored sections upstream [from the restoration sites] were often ecologically better than the restored sections or those downstream of restorations.”⁴²**

⁴¹ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269. (<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

⁴² Hilderbrand, Robert H., et. al., 2020, “Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

Coalition to Stop Stream Destruction

- Carr et. al.'s meta-analysis of 30 projects concluding that the ecology did not improve.⁴³
- Southerland et. al.'s analysis of 11 streams In Anne Arundel County showing that the biology did not improve.⁴⁴
- Stowe et. al.'s analysis of results from 23 projects that concluded that stream “restoration” produces only transitory, not permanent, changes to abundance and species richness of fishes, especially to sensitive taxa and in urban systems.⁴⁵

In addition, Montgomery County Department of Environmental protection has admitted that *none* of their past 56 projects⁴⁶ starting in 1992 improved stream ecology.⁴⁷

Parks uses the misleading term “streamside tree loss.” What this really means is that trees are falling over, sometimes into the stream, as they die or are undercut by the stream. This a perfectly natural and beneficial process of stream ecology. Apparently, Parks did not consult with any ecologists. Otherwise, they would know that dead and dying trees are essential components of a complete ecosystem. As Travis Audubon puts it, “Dead trees are ‘home sweet home’ to woodpeckers.”⁴⁸ Plus, rather than being a problem, trees falling into streams is a natural process and is beneficial since the small damming effect creates new types of habitats, new aerating riffles, etc. Trees are being cut and dropped into streams by more well-informed, innovative ecologists – read on.

Per an article in the Bay Journal⁴⁹: “The practice is known officially as “large woody material stream restoration” but more commonly as “chop and drop.” ...Trees and branches have been dropping generous loads of woody debris into streams, without help from humans, for all of Earth’s history — until the last few centuries, when old growth forests virtually disappeared in a geological blink of an eye. And even where second-growth forests have taken their place, the trees are not old enough to regularly supply woody material to the streams. Enter chop and

⁴³ Carr, J., Hart, D., McNair, J., 2006, “Compilation and Evaluation of Stream Restoration Projects: Learning from Past Projects to Improve Future Success,” The Patrick Center for Environmental Research, The Academy of Natural Sciences of Drexel University, Report Submitted to the William Penn Foundation.

<https://ansp.org/research/environmental-research/projects/restoration/>

⁴⁴ Southerland, Mark, et. al., 2021, “Vertebrate Community Response to Regenerative Stream Conveyance (RSC) Restoration as a Resource Trade-Off,” Award: 18002 CBT Restoration Research Grant to Tetra Tech and UMCES-Chesapeake Biological Laboratory; <https://cbtrust.org/wp-content/uploads/FINAL-Report-for-18002-Tetra-Tech-CBL-CBT-RR-Vertebrates-in-RSCs-30SEP2021-Submitted-to-CBT.pdf>

⁴⁵ Stowe, Edward S., Petersen, Kelly N., et. al., 2023, “Stream restoration produces transitory, not permanent, changes to fish assemblages at compensatory mitigation sites,” Restoration Ecology, Volume 31, Issue 5, Jul 2023, <https://onlinelibrary.wiley.com/doi/10.1111/rec.13903> and <https://onlinelibrary.wiley.com/doi/epdf/10.1111/rec.13903>

⁴⁶ Montgomery County, Maryland Department of Environmental Protection, Watershed Restoration Projects, <https://apps2.montgomerycountymd.gov/MCGSPAApps/Project.aspx?id=2>, searched on “stream Restoration” for COMPLETED projects.

⁴⁷ Montgomery County Department of Environmental Protection presentation Stormwater Partners Network on January 16, 2024. “We have not seen benthic [macroinvertebrate] improvement in any of our stream restorations.” BMIs are a standard measure of stream health.

⁴⁸ <https://travisaudubon.org/murmurations/dead-trees-are-home-sweet-home-to-woodpeckers>

⁴⁹ “Chop and drop’ tree felling aims to improve stream ecosystems in Pennsylvania,” by Ad Crable, Apr 25, 2024, Chesapeake Bay Journal. https://www.bayjournal.com/news/wildlife_habitat/chop-and-drop-tree-felling-aims-to-improve-stream-ecosystems-in-pennsylvania/article_bbb95bae-fe4b-11ee-86ce-b73ce8e8f98e.html

Coalition to Stop Stream Destruction

drop, where teams of trained workers armed with little more than helmets, chainsaws and perhaps winches trek deep into the woods, where heavy machinery can't go. There, they restore a long-missing link to high-quality streams, especially in inaccessible and vital headwaters. ...The trunks and limbs embedded in the stream created new riffles, pools and undercut banks where fish could seek refuge and get out of fast-flowing current. Oxygen was plowed into the water. The sandy bottom was scoured away to expose a layer of gravel preferred by trout for spawning. In the fall, leaf clusters collected by the branches contained stoneflies and other aquatic insects that trout feed on. ...During storms, water is now diverted onto the adjacent forest floor, creating wetlands that act as sponges and blunt the destructive force of floods. During droughts, that stored water recharges the stream as it ebbs. The wet spots are corridors for amphibians."

"While Parks is implementing the Glenallan Tributary project on behalf of DEP for credit toward the County's MS4 permit and Anacostia Total Nitrogen, Total Phosphorus, and Total Suspended Solids Total Maximum Daily Load (TMDL) program, we proceeded with this project based on the poor quality of the pre-restoration channel and the potential for improvements in the watershed."

COMMENT: The goals of the project are admirable, but the fact remains that science shows that stream "restorations" do not work. Parks and DEP refuse to acknowledge the published science which analyzed over 700 stream "restorations", documentation of washed out projects in Montgomery County, and ground observations of environmental damage (see references and photographs in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) and a video of the Glenallan stream "restoration" (<https://www.youtube.com/watch?v=91O2bAdT8PY>) all leading to the unavoidable conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. Montgomery County DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology. We have no data from Parks.

"Parks spent several years designing the restoration project and working through the County and State review, approval, and permitting processes."

COMMENTS: The design time spent is irrelevant – results should always trump effort. Regarding the design, Palmer et. al (2014)⁵⁰ said that "Methods like NCD [Natural Channel Design] that require heavy equipment, engineering designs, and construction personnel are expensive to implement and therefore very lucrative for businesses. The combination of training materials, the profit factor, and Rosgen's [the "father" of NCD] charismatic personality has contributed significantly to the heavy reliance on the NCD approach...."

⁵⁰ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, "Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals," Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269. (<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

Coalition to Stop Stream Destruction

Hilderbrand et. al. (2020)⁵¹ concluded that, “In relative terms, RSC [Regenerative Stormwater Conveyance]-dominant restorations performed similarly to NCD [Natural Channel Design]-dominated; both showed limited to no ecological uplift due to restoration activities.”

The fact this Parks has been “working through the County and State review, approval, and permitting processes” is a common red herring used by proponents to justify stream “restorations” that should never have been built. As everyone knows, “The right to do something does not mean that doing it is right,” in the words of William Safire.

“Prior to in-stream construction, Parks required the contractor to conduct a fish relocation, which reverified the poor in-situ ecological conditions of the restoration reach. “

COMMENT: What about the other animals that were presumably crushed by the heavy construction equipment such as frogs, toads, box turtles, snakes, salamanders, etc. that could not run away? While the site may have had a poor ecological condition, the science referenced above shows that stream “restorations” do not improve ecological conditions.

“Once Parks obtained the required permits, the construction was bid among pre-qualified contractors that specialize in environmental restoration construction.”

COMMENTS: This is misdirection and disinformation. First, to borrow a phrase from William Safire, just because a permit was obtained does not mean that doing it is right.

Second, apparently there are no qualified contractors based on the results of their work. The published science which analyzed over 700 stream “restorations”, documentation of washed out projects in Montgomery County, and ground observations of environmental damage (see references and photographs in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) and a video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>) all lead to the conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. Montgomery County DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology. We have no data from Parks’ past projects.

“Thirty-eight percent of the drainage area to the Glenallan Tributary project is covered by impervious surfaces and as a result its banks, like those of many other urban streams, are highly eroded.”

COMMENT: We are glad that Parks recognizes the source of the problem – stormwater from developed areas that fire hoses into streams. Unfortunately, Parks fails to acknowledge the fact that stream “restorations” *do not* stop stream erosion since the source of the problem - uncontrolled stormwater from developed areas - is not controlled by constructing stream

⁵¹ Hilderbrand, Robert H., et. al., 2020, “Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

Coalition to Stop Stream Destruction

“restorations.” This is the reason these projects are only a temporary band-aide, at best, and are being washed out by storm events post construction.

Consider this: after the \$700K Lower Booze Creek stream “restoration” in Potomac, DEP’s web site says, “Storm damage occurred very soon after construction, initiating structural failures.” The repairs cost an additional \$3.6M.⁵² Plus, the Grosvenor Luxmanor repair cost is scheduled for \$4.8M⁵³ and the Old Farm Creek Tributary in North Bethesda repair cost scheduled for \$800K per MoCo DEP⁵⁴

Doing a stream “restoration” instead of controlling stormwater *before* it enters a stream is like trying to repair water-damaged furniture while the roof is still leaking.

The only solution is to remove the external stressor – uncontrolled stormwater from developed areas. This can only be done with out-of-stream stormwater control projects such as bioretentions, raingardens, permeable pavement, tree planting, and dozens of other types of non-destructive practices authorized by MDE to meet the MS4 permit.⁵⁵

Another ruse promulgated by both Parks and DEP when trying to justify a stream “restoration” is to claim that any given project *must* be done, either to stop the erosion or meet their MS4 permit or both, and that there are not enough upland areas for alternative out-of-stream stormwater control to stop the erosion. However, virtually all streams in Montgomery County are eroding. Rather than attempting to control 100% of the erosion at one stream location using a stream “restoration” (which the facts show cannot be done anyway), the county should do upland control in multiple watersheds which would result in less erosion in multiple streams while garnering the same amount of MS4 permit credits. This would eliminate the perceived problem of insufficient area for upland control at any one location.

Parks and DEP have used unsubstantiated, arm-wavy arguments that there is not enough upland space for out-of-stream projects. DEP has referenced papers by Williams et. al., 2022⁵⁶

⁵² Per DEP, <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Presentation.pdf>

⁵³ <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/grosvenor-presentation-wildwood-manor.pdf>

⁵⁴ <https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/restoration/oldfarm-creek-neilwood/WRE12-26%20Old%20Farm%20Creek%20Public%20Meeting%20Presentation%20Final.pdf>

⁵⁵ MDE Accounting Guidance document:

<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

⁵⁵ https://www.washingtonpost.com/national/2024/09/28/climate-heat-trees-cooling-solutions-united-nations/de980bb2-7d9d-11ef-980d-341a84dff8f_story.html

⁵⁶ Brianna Williams, Kristina G. Hopkins, Marina Metes, Daniel Jones, Stephanie Gordon, William Bradley Hamilton (2022), “Tracking geomorphic changes after suburban development with a high density of green stormwater infrastructure practices in Montgomery County, Maryland,” *Geomorphology*. (<https://doi.org/10.1016/j.geomorph.2022.108399>)

Coalition to Stop Stream Destruction

and Thompson, et al., (2023)⁵⁷ to incorrectly conclude that upland out-of-stream projects cannot stop stream erosion.

However, the proper conclusion from those papers is simply that too few properly sized upland projects were done to keep stormwater from fire hosing into streams. Parks and DEP would use their logic to conclude that no umbrella can keep one's head dry during a rainstorm based on only using a cocktail umbrella.

The only solution to stream erosion is upland (out-of-stream) projects that control stormwater runoff at its source (from roads, parking lots, roofs, etc.) with bioretentions, permeable pavement, rain gardens and many other practices.

It is hard to believe that DEP does not even do out-of-stream alternative analyses for every proposed stream "restoration" project. (We do not know about Parks – maybe they will tell us). For example, DEP never did an upland alternative analysis for the Falls Reach project⁵⁸ or the scheduled Grosvenor stream "restoration."⁵⁹ Second, DEP has never proven, *because it can't*, that the county's MS4 permit cannot be met unless stream "restorations" are done.

Another of DEP's rationales for stream "restorations," aside from their false claims about stream "restoration" benefits and false claims about not enough upland area, is that it is more convenient to sacrifice our natural areas to stream construction projects than to take on the "challenge" of controlling stormwater outside of streams – they would rather do one mega-project than several smaller ones.⁶⁰

What is particularly egregious is that Maryland Department of the Environment (MDE) has statewide data from its 2022 Annual Report on Financial Assurance Plans (FAPs) showing there are 20 non-destructive, out-of-stream stormwater project types that are more cost effective than stream "restorations."⁶¹ This waste may be of interest to the Montgomery County Office of the Inspector General whose website (<https://www.montgomerycountymd.gov/oig/hotline.html>) defines waste as "The careless expenditure of county funds or resources above and beyond the level that is reasonably

⁵⁷ Thompson, Tess Wynn et al., (2023) "Effectiveness of stormwater management practices in protecting stream channel stability," presented at the 2023 Maryland Water Monitoring Council Annual Conference (11/17/2023). Not yet posted to <https://cbtrust.org/grants/restoration-research/>
From <https://dnr.maryland.gov/streams/Documents/MWMC/AGENDA-MWMC-Annual-Conference-2023.pdf>, link to presentation at <https://drive.google.com/file/d/1isYAs58zVsLJ9H1VOiu4PvzMuYvSplf3/view>

⁵⁸ Personal communication from DEP to K. Bawer at public Falls Reach site visit.

⁵⁹ Statement by DEP at public site visit.

⁶⁰ Personal communication from DEP to K. Bawer at public Falls Reach site visit.

⁶¹ On a statewide basis MDE data (per MDE's 2022 Annual Report of Financial Assurance Plans, <https://mde.maryland.gov/programs/Water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>) shows that there are 33 different types of out-of-stream projects (such as green roofs, rain gardens, and bio-swales) that are more cost effective (less cost per impervious acre treated) than stream "restorations." This is not even a comparison of the lifecycle cost or total cost of ownership (TCO) over time, which is the sum of construction cost, maintenance, repair, replacement costs and a quantification of the value of lost or gained ecosystem functioning (services) - for example, trees have been shown to reduce air conditioning expense. Lifecycle cost comparisons would probably tip the scales even further in favor of upland (out-of-stream) practices due in part to the fact that stream "restorations" are being washed-out and repair is extremely expensive.

Coalition to Stop Stream Destruction

required to meet the needs of the county....” They give examples include buying excessive goods or services and inefficient use of resources.

Parks rightfully points out that most stormwater comes from county land outside of park lands which Parks cannot control to meet the Parks’ MS4 permit. Instead of finger pointing, Parks and MDE should ask the state MDE to combine their MS4 permits.

Finally, why should the public pay for stream damage caused by stormwater runoff from private property? Why are the interests (read, profits) of developers put ahead of those of residents who want their parkland and other natural areas protected?

“The stream restoration project at Glenallan will stabilize the stream channel and degraded storm drain outfalls, reduce downstream sediment loads, improve groundwater levels and floodplain interaction, and enhance habitat features and biological connectivity.”

COMMENTS: This is false, except for possible stabilization of the degraded storm drain outfalls. It is the height of hubris to claim success (“The stream restoration project at Glenallan will...”) before the project has even been completed.

This is especially true in light of the published science which analyzed over 700 stream “restorations”, documentation of washed out projects in Montgomery County, and ground observations of environmental damage (see references and photographs in the presentation https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) and a video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>) which all lead to the conclusion that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. Montgomery County DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology. We have no data from Parks’ past projects. Let’s not hold our breaths that this project will be the one that bucks the trend.

If the objective is to “reduce downstream sediment loads,” why is sediment being dumped into the Glenallan Tributary to raise the stream bed? Since the source of erosion (uncontrolled out-of-stream stormwater runoff from developed areas) is not being controlled, this newly added sediment will eventually be washed out as described below.

According to a 2021 paper by Dr. John Field⁶², fluvial geomorphologist, for the City of Alexandria on the topic of raising a stream channel such as the Glenallan tributary,

- “There is no guarantee that the imported fill’s pollutant levels will not match or exceed those of the natural bank soils, which the City claims to be the source of pollutants reaching Chesapeake Bay.”
- “The fill will completely bury and kill the existing ...aquatic ecosystem of macroinvertebrates, amphibians, and fish....”

⁶² Field, John, 2021, “Analysis of the Stream “Restoration” Design for Taylor Run in Alexandria, VA”

Coalition to Stop Stream Destruction

- Due to the cutting of mature trees, “the City’s ability to achieve its goal of preserving and enhancing aquatic and riparian ecology... will have already been lost for decades, and perhaps permanently.”
- “The City also will fail to achieve its goal of reducing sediment flows into Potomac River and Chesapeake Bay. ...channel incision and widening have occurred in response to the extensive development in the watershed and to establish a new equilibrium condition. Adding fill to the channel runs directly against this natural response to urbanization: After decades of naturally reducing its gradient through incision, the filled-in, elevated streambed will produce a steeper channel that will increase (not decrease) the stream’s capacity to carry sediment. The stream’s erosive energy will be rejuvenated and, as a result, Taylor Run will move sediment more efficiently towards Chesapeake Bay.”
- “Further, the fill will replace the material that has taken decades to erode away, making sediment available to wash downstream again. As the proposed design does not address the excess runoff responsible for the incision and widening, the fill’s long-term fate will ultimately be the same: The stream will once again work toward a configuration in equilibrium with the urbanized watershed, eroding the added material until channel stability is reached. This exact scenario has already played out in Strawberry Run, which was “restored” several years ago through a similar “Natural Channel Design” project. Simply put, sediment should not be added to the stream if the goal is to reduce the amount of sediment being carried to the Bay.

From a 2020 paper by Dr. John Field⁶³, fluvial geomorphologist, for an Arlington County stream “restoration”:

- “Why, then, is the sediment that has taken decades to wash downstream now being replaced with imported fill? The long-term fate of the fill will invariably be similar to previous soils eroded away given that implementation of the project will have no effect on the high volume of runoff emanating from the urbanized watershed. Simply changing the form (i.e., width, slope, and sinuosity) of the channel as proposed in the restoration design does not change the process at the root of the problem.”
- “The addition of fill, therefore, achieves exactly the opposite result of the project’s goal to reduce downstream sediment transport towards Chesapeake Bay.”
- “In addition, the fill added to the existing channel will be far more erodible compared to the cohesive native soil, so is more likely to be removed in years rather than decades.”
- “Put simply, why add sediment to reduce sediment, especially if the project goals are less likely to be achieved?”

Regarding the stated goal of “floodplain interaction,” more commonly referred to as floodplain reconnection, per Field, 2020⁶⁴:

- “The use of fill to raise the bed elevation in order to regularly flood the valley bottom is also problematic.”

⁶³ Field, John, 2020, “Analysis of the Stream Restoration Design of Donaldson Run Tributary B in Arlington, VA”

⁶⁴ Ibid

Coalition to Stop Stream Destruction

- “The vegetation growing on the valley bottom is adapted to an upland environment ...that are rarely inundated by floodwaters.”
- “Those trees saved near the channel and others growing beyond the limits of disturbance will not, however, be saved from the frequent overbank flooding that will ensue if the project is implemented as designed. Not adapted to frequent inundation, the trees and other plants growing on the valley bottom will become stressed and ultimately die.”

Regarding the claim that the project will “improve groundwater levels,” removal of large numbers of mature trees may very well cause the groundwater level to rise, which would not be to say it would be “improved.” According to Fraley-McNeal, L. et al. (2022)⁶⁵, “Loss of existing trees in the riparian zone from stream restoration implementation occurs either through direct removal during construction or mortality afterwards due to increased groundwater elevations and/or extended inundation of the floodplain, compaction, and root disturbance from construction activities. ... For projects that involve floodplain reconnection, mortality of trees in the riparian zone may occur as soils are inundated over time. ... When mature trees are removed, they cannot be replaced with similar-sized trees that perform the same ecological functions. Depending on the pre-restoration condition and level of construction disturbance, 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).”

“Additionally, the Glenallan Tributary stabilization will protect structures on an adjacent property that are being threatened by ongoing channel erosion.”

COMMENT: This is disinformation presented as fact and fearmongering. First, no adjacent properties are being threatened – while there is stream channel erosion, it is well away from any houses. Second, since the source of erosion - uncontrolled out-of-stream stormwater runoff from developed areas - is not being controlled, this project will eventually be washed out.

Some photographic examples stream “restorations” failure to protect adjacent properties are the Old Farm Creek in North Bethesda and the Bedfordshire project in Potomac.⁶⁶

⁶⁵ Fraley-McNeal, L. et al. (2022), “Maintaining Forests in Stream Corridor Restoration and Sharing Lessons Learned,” Center for Watershed Protection; <https://owl.cwp.org/mdocs-posts/maintaining-forests-in-stream-corridor-restoration-and-sharing-lessons-learned-final-report/>

⁶⁶ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024 (https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

Coalition to Stop Stream Destruction



(Above: along an adjacent private property, a failed attempt at stream bank stabilization with Gabion baskets and rip rap along Old Farm Creek Tributary, North Bethesda)

Coalition to Stop Stream Destruction



(Above: eroded stream bank and displaced boulders along the Bedfordshire stream "restoration" in Potomac, MD)

These projects never work because the stressor - stormwater fire hosing into the stream from developed areas - has not been eliminated.

DEP has accused us of cherry-picking bad examples,⁶⁷ yet they have not provided any evidence to the contrary. Both DEP and Parks needs to make public their list of projects, which ones have been washed out and need repair, and what type and number of storm events (e.g. 1-year, 10-year, 100-year storms) has each project experienced since construction. To claim, for example, that a certain project is "storm-proof" if it has only been subjected to 1-year storms would be an egregious claim.

⁶⁷ Statement by DEP at public site visit to the planned Grosvenor Luxmanor stream "restoration" sites.

Coalition to Stop Stream Destruction

Thus, stream “restorations” simply do not stabilize streams since these projects are washed out by post-construction storms. As shown in Palmer’s (2014)⁶⁸ analysis of 644 stream “restorations,” less than half of all stream “restorations” showed improvement in stabilizing channels – worse than a coin toss.

Plush, Laub et. al., 2013⁶⁹, concluded that “... riparian buffer restoration [i.e., tree planting] is a more ecologically favorable method than designed channel restoration for bank stabilization.

“We have coordinated closely with adjacent property owners throughout the design and construction process, and we have their full support.”

COMMENTS: This is blatantly false. We spoke to an adjacent property owner on Wallace Avenue, whose property abuts the project, on November 18, 2024. This owner said that their only interaction with the county was a flyer inviting them to a meeting which they did not attend much less give their “full support.” It is not known how many other adjacent owners similarly did not give their support for this project.

“Lastly, WSSC water and gravity sewer infrastructure runs alongside and across portions of Glenallan Tributary. The project design addresses the deepening of the channel and the resulting highly erodible steep banks, known as erosive downcutting, which were putting public utilities at risk of failure.”

COMMENTS: This is a common ploy of proponents to disingenuously justify doing a stream “restoration.” It uses fearmongering to blur public utility, including sewer line, protection projects with the purpose of a stream “restoration.” Targeted spot hardening of sewer lines in the immediate area of the problem can fix this, unlike the hundreds or thousands of feet of some stream “restorations (1500 linear feet in the case of the Glenallan Tributary between Georgian Woods Place and Glenallan Avenue).

In reality, these projects are only short-term band aides because the stressor - stormwater fire hosing into the stream from developed areas - has not been controlled.

Tree Protection, Reforestation, and NNI Management

“As your letter states, some stream restoration projects involve the removal of mature trees to allow for construction access and grading.

This is greenwashing. Parks is attempting to justify “removal of mature trees to allow for construction access and grading.” The fact is that no trees would have to be cut if this

⁶⁸ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269. (<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

⁶⁹ Laub, B.G, McDonough, O.T, Needelman, B.A., Palmer, M.A., 2013, “Comparison of Designed Channel “restoration” and Riparian Buffer “restoration” Effects on Riparian Soils,” “restoration” Ecology, Vol. 21, Issue 6, November 2013 (<https://onlinelibrary.wiley.com/doi/abs/10.1111/rec.12010>)

Coalition to Stop Stream Destruction

misguided project was not done. The log piles of cut mature trees can be seen in the video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>).

“However, Montgomery Parks does not engage in clear cutting of trees on any projects implemented on Montgomery County parkland. In the video linked in your email, the area shown did not have trees prior to the start of construction and was overwhelmed with undesirable NNI vegetation.”

COMMENT: This is false and easily disproved. First, the video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>) clearly shows piles of cut mature trees. These did not just fall out of the sky. Second, DEP’s presentation “Glenallan Stream Restoration Project, Public Meeting,” dated October 24, 2017⁷⁰ shows many slides labeled “Existing Conditions.” These photographs, such as the one below, show forested areas that are being been clearcut. (This presentation has apparently been taken off the web, but a copy will be supplied on request.)



Below is another example of the clearcutting done for this project.

⁷⁰ This presentation has apparently been taken off the web, but a copy will be supplied on request.

Coalition to Stop Stream Destruction



“At the Glenallan project, tree removal was selective, minimal, and only as necessary for the stable construction of the stream channel;”

COMMENTS: This is typical Parks and DEP greenwashing and a typical red herring to deflect from the fact that this project should never have taken place. The fact is that *no* trees would have to be cut if this misguided project was not done. Parks asks that we not believe our eyes when the [video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>) shows wanton clearcutting of the riparian forest, piles of cut mature trees, a temporary haul road that slices through the forest, and imported rock rubble being haphazardly dumped, not placed, into the stream. The few trees with scrape protectors attached to their trunks will most probably die due to soil compaction of their critical root zones by heavy construction equipment. See also the photo above.

“many of the trees removed were already victims of the channel erosion and would not have survived the continuing erosion.”

Coalition to Stop Stream Destruction

COMMENTS: Apparently Parks did not consult with any ecologists. Otherwise, they would know that dead and dying trees are essential components of a complete ecosystem. As Travis Audubon puts it, “Dead trees are ‘home sweet home’ to woodpeckers.”⁷¹ Plus, rather than being a problem, trees falling into streams is a natural process and is actually beneficial since the small damming effect creates new types of habitats, new aerating riffles, etc. without need for heavy machinery. Unlike Park’s misguided philosophy, trees are being dropped into streams by more enlightened ecologists.

Per an article in the Bay Journal⁷²: “The practice is known officially as “large woody material stream restoration” but more commonly as “chop and drop.” ...Trees and branches have been dropping generous loads of woody debris into streams, without help from humans, for all of Earth’s history — until the last few centuries, when old growth forests virtually disappeared in a geological blink of an eye. And even where second-growth forests have taken their place, the trees are not old enough to regularly supply woody material to the streams. Enter chop and drop, where teams of trained workers armed with little more than helmets, chainsaws and perhaps winches trek deep into the woods, where heavy machinery can’t go. There, they restore a long-missing link to high-quality streams, especially in inaccessible and vital headwaters. ...The trunks and limbs embedded in the stream created new riffles, pools and undercut banks where fish could seek refuge and get out of fast-flowing current. Oxygen was plowed into the water. The sandy bottom was scoured away to expose a layer of gravel preferred by trout for spawning. In the fall, leaf clusters collected by the branches contained stoneflies and other aquatic insects that trout feed on. ...During storms, water is now diverted onto the adjacent forest floor, creating wetlands that act as sponges and blunt the destructive force of floods. During droughts, that stored water recharges the stream as it ebbs. The wet spots are corridors for amphibians.”

“Montgomery Parks’ design approach considers every streamside tree individually and staff weigh all options carefully before making the difficult decision to remove a tree or any other native vegetation.”

COMMENT: This is greenwashing. Apparently, Parks did not weigh the option of suggesting upland stormwater control by DEP in the same or different watersheds for the same amount of MS4 permit credits. The fact is that no trees would have to be cut if this misguided project was not done. Parks asks that we not believe our eyes when the video (video of the Glenallan stream “restoration” (<https://www.youtube.com/watch?v=91O2bAdT8PY>) shows wanton clearcutting of the riparian forest and piles of cut mature trees. It appears that Parks’ decision to chainsaw those trees was not that difficult, unfortunately.

“Additionally, some removals were completed to eradicate non-native invasive Norway Maples (*Acer platanoides*) from the site.”

⁷¹ <https://trisaudubon.org/murmurations/dead-trees-are-home-sweet-home-to-woodpeckers>

⁷² “Chop and drop’ tree felling aims to improve stream ecosystems in Pennsylvania,” by Ad Crable, Apr 25, 2024, Chesapeake Bay Journal. https://www.bayjournal.com/news/wildlife_habitat/chop-and-drop-tree-felling-aims-to-improve-stream-ecosystems-in-pennsylvania/article_bbb95bae-fe4b-11ee-86ce-b73ce8e8f98e.html

Coalition to Stop Stream Destruction

COMMENT: This is greenwashing. While any removal of invasive plants is commendable, the removal of Norway Maples could have been done by hand or by walking in with chainsaws, not heavy construction equipment. This is a bogus attempt to justify the entire project.

“Any trees that must be taken are reused on our site either in the stream channel to provide root ball habitat in pools, or on the floodplain and riparian enhancement areas as terrestrial streamside habitat.”

COMMENT: This is greenwashing. The fact is that no trees “must be taken” if misguided projects like this are not done. Parks asks that we not believe our eyes when the [video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>) shows wanton clearcutting of the riparian forest and piles of cut mature trees. To say that cut trees will be used for another purpose is no justification for unnecessarily cutting them in the first place.

Second, DEP’s presentation “Glenallan Stream Restoration Project, Public Meeting,” dated October 24, 2017⁷³ shows many slides labeled “Existing Conditions.” These photographs (see example above) show forested areas that have now been clearcut. (This presentation has apparently been taken off the web, but a copy will be supplied on request). Parks’ professed need to use newly cut trees to create new “terrestrial streamside habitat” would not have been necessary if Parks had not destroyed the pre-existing “terrestrial streamside habitat” in the first place.

“The video linked in your letter shows how Parks’ construction efforts put an emphasis on the protection of the remaining trees. It shows planking (wooden boards wrapped around trees) that protect tree trunks from accidental damage by passing equipment.”

COMMENT: This is greenwashing and disinformation. First, the need for “protection of the remaining trees” is only necessitated by the construction of this misguided project.

Second, the few trees with planking (wooden boards wrapped around trees) will most probably die due to soil compaction of their critical root zones since they are on the very edge of the work zone used by heavy construction equipment as shown in the photo below. Again, Parks asks us to not believe our eyes.

⁷³ This presentation has apparently been taken off the web, but a copy will be supplied on request.

Coalition to Stop Stream Destruction



The fact is that no trees would have to be cut or protected if this misguided project was not done. Parks asks that we not believe our eyes when the [video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>) shows wanton clearcutting of the riparian forest and piles of cut mature trees.

“Welded wire tree protection fencing is visible in the video, as well as tree protection “islands” where we preserved groups of mature trees within our limits of disturbance.”

COMMENT: This is greenwashing and disinformation. First, the need for “tree protection fencing” is only necessitated by the construction of this misguided project. The photograph above shows both planking (wooden boards wrapped around trees) and the welded wire tree protection fencing. However, many of these trees will die due to soil compaction of their critical root zones by the heavy construction equipment seen in the video⁷⁴

“It also showed haul roads that weave through the existing forest, finding paths free of existing trees so trees aren’t removed merely for equipment access.”

⁷⁴ [Video of the Glenallan stream “restoration”](https://www.youtube.com/watch?v=91O2bAdT8PY) (<https://www.youtube.com/watch?v=91O2bAdT8PY>)

Coalition to Stop Stream Destruction

COMMENT: This is false as documented with photographic evidence. Apparently, Parks uses a different definition of “weaving” than the rest of us. The photo below shows the arrow-straight haul road through the forest. Parks should define what they mean by “weaving.”



Again, we are asked to not believe our eyes. The video (screen shot below) also clearly shows a wide, straight haul road.

Coalition to Stop Stream Destruction



Perhaps Parks will define what *they* mean by a “weaving” road.

“Those haul roads are lined with mulch and wooden mats to protect the forest floor from compaction during construction.”

COMMENT: This is a red herring to deflect from the fact that this project should never have taken place. Plus, there are many potential detrimental impacts from the use of mulch.

Botanist John Parrish said, “If they leave it in place, it will probably be too deep for most preexisting perennial herbs to emerge, assuming they even survive the time period smothered under mulch and planks. If they remove it, they would have to do it manually with rakes otherwise they will compact the soils if they use motor vehicles to scrape it away.”⁷⁵

Gérard, F., et al. (2015)⁷⁶ say that, “the application of mulch can alter soil chemistry, particularly nutrient cycling and pH levels, which may negatively affect microbial communities and forest floor biodiversity. Certain types of mulch can increase soil acidity or alter nutrient dynamics, leading to long-term soil degradation.”

Jones, M. B., et al. (2017)⁷⁷ performed a study that “discusses how certain mulching practices in forest restoration can have unintended negative consequences, such as suppressing native vegetation by altering light availability and soil temperature. The thick layers of mulch can

⁷⁵ Personal communication, 1/15/2025.

⁷⁶ Gérard, F., et al. (2015). "Impact of mulching on forest soil microorganisms: A review of potential risks." *Forest Ecology and Management*, 357, 99-106.

⁷⁷ Jones, M. B., et al. (2017). "Evaluating the ecological impact of mulches in forest restoration projects." *Restoration Ecology*, 25(3), 433-441.

Coalition to Stop Stream Destruction

inhibit the growth of understory plants, particularly those that require more light or specific soil conditions, disrupting forest regeneration.”

Korb, J. E., et al. (2011)⁷⁸ discussed how mulch, “...can contribute to the spread of non-native species in forest ecosystems. The mulch may carry seeds of invasive plants, which, when decomposed or redistributed, can establish new invasive populations, further threatening the native biodiversity of the forest floor.”

“In the case of the Glenallan project, portions of our haul roads were selected to follow a relic asphalt road through the woods that will be carefully removed when the project is complete.”

COMMENT: This is a half-truth. While the “relic asphalt road” may have run “through the woods” before construction started, the photo below shows that the woods have been clearcut and are now a stack of cut logs. Still, we are glad that the construction material will be “carefully removed” and hope that the large cut logs do not interfere with that process.



“Montgomery Parks prioritizes the conservation of existing trees based on a clear understanding of the pressures newly planted trees face from deer and NNIs. The Glenallan Tributary project includes an NNI

⁷⁸ Korb, J. E., et al. (2011). "Invasive plant management and the unintended consequences of mulch application in forest ecosystems." *Biological Invasions*, 13(3), 657-669.

Coalition to Stop Stream Destruction

management plan with efforts extending into the forest beyond our project limits to attempt to establish a healthier native vegetative community.”

COMMENTS: This is Orwellian disinformation. Parks would have us believe that to conserve existing trees, they must be cut down. If parks truly “prioritizes the conservation of existing trees,” then we would not have the video and photographs of log piles such as the ones above and below.



Coalition to Stop Stream Destruction



Furthermore, DEP has admitted, and we have seen, that it cannot control the growth of invasive post-stream “restoration” construction. This can be seen at any county stream “restoration” project such as the ones at Falls Reach and Breewood. These projects disturb large swathes of soil which is a major cause of invasive plant spread.

A 10/18/2021 Montgomery County DEP fact sheet about their Falls Reach, Potomac stream “restoration” states “Vegetative cover in the stream riparian area has successfully been reestablished....” However, a site visit on 10/24/2023 showed that four and a half years after project completion in March 2019, the forest floor was overrun with the non-native invasives Japanese Stiltgrass (*Microstegium vimineum*) and Hairy Jointgrass (*Arathroxon hispidus*).

Likewise, Montgomery Parks cannot control invasives on undisturbed parkland, much less on “restoration” sites. I was a Parks Weed Warrior for six years then a Weed Warrior Supervisor for eleven more years and witnessed uncontrolled invasives in wide areas of our parks. I

Coalition to Stop Stream Destruction

stopped volunteering when Parks threatened to “fire” me if I were to ever discuss the issue of stream “restorations.”

“The project will implement a robust planting plan well above regulatory requirements that consists of native tree, shrub, and herbaceous species, as well as live staking along the channel banks. Planting will happen late winter/early spring 2025 and include deer protection measures around tree and shrub plantings.”

COMMENT: This is greenwashing and a typical red herring that deflects from the fact that these stream “restorations” should not be done in the first place. Parks’ objective should be to save our forests, not replant them after Parks clearcuts them. Parks apparently operates in the Bizarro World where “Us do opposite of all Earthly things!”⁷⁹

No amount of planting can replace what was clearcut for this project. DC-area botanist John Parrish (formerly with the National Park Service Center for Urban Ecology, past vice president of the Maryland Native Plant Society, currently serving on the Boards of Conservation Montgomery and the Friends of Ten Mile Creek) has said, “While there is replanting of young saplings after stream “restorations, planting groups of trees on open ground to mitigate forest loss cannot replicate the loss of long-established forest soils, structure and biodiversity of forests destroyed.... It will take 100 years or more for a forest to develop soils and structure capable of sustaining a full complement of native plants and animals.”⁸⁰ Plus, it will take decades for young trees to sequester as much carbon as the large trees that were cut down.

“Our goal is for the restored riparian buffer to be more diverse and resilient than the degraded system that existed pre-construction, and for our planting efforts to enhance the pre-existing trees and native understory that is preserved throughout construction.”

COMMENT: This is greenwashing and a typical red herring that deflects from the fact that these stream “restorations” should not be done in the first place. Parks’ attitude seems to be, “We’ll cut down all the trees, but don’t worry because we will clean up all the wood chips.” No amount of planting can replace what was clearcut for this project. DC-area botanist John Parrish (formerly with the National Park Service Center for Urban Ecology, past vice president of the Maryland Native Plant Society, currently serving on the Boards of Conservation Montgomery and the Friends of Ten Mile Creek) has said that after the loss of long-established forest soils, structure and biodiversity, “It will take 100 years or more for a forest to develop soils and structure capable of sustaining a full complement of native plants and animals.”

“Prior to construction, many areas of the site were unwalkable due to being overtaken with species such as bamboo (*Phyllostachys aurea* and *Pseudosasa japonica*), porcelain-berry (*Amur peppervine*), wineberry (*Rubus phoenicolasius*), Japanese knotweed (*Reynoutria japonica*), and other NNI species.”

⁷⁹ Greenberger, Robert; Pasko, Martin (2010). The Essential Superman Encyclopedia. Del Rey. pp. 28–29. ISBN 978-0-345-50108-0.

⁸⁰ Public Hearing Testimony to the Montgomery County Council, RE: Bill 25-22 Forest Conservation – Trees (Oct. 4, 2022 Public Hearing), by John Parrish

Coalition to Stop Stream Destruction

COMMENT: This is a red herring to deflect from the fact that this project should never have taken place. Any invasive removal could, and should, have been done by hand and possibly with spot herbicide treatment, not by scraping the forest floor bare with heavy equipment. This is a bogus attempt to justify the project.

Use of Rock for Stream Stabilization

“Your letter also references rock rubble being “dumped” into the stream as an example of a “failed” stream restoration.

COMMENT: No, our reference to rock rubble being dumped into the stream was to point out how environmentally destructive this project is. See the video⁸¹ screen shot below.



“The riprap shown in the video already existed on site as the result of a 1960’s WSSC infrastructure protection project (not a stream restoration) and is being replaced with more sustainable natural channel design techniques to protect the WSSC infrastructure.”

COMMENT: This statement contains both greenwashing and disinformation. It is greenwashing because Parks throws out a typical red herring to deflects from the fact that these stream “restorations” should not be done in the first place. This is a common ploy, the same one used by DEP, to disingenuously justify doing a stream “restoration.” It uses fearmongering to blur infrastructure, in this case sewer line, protection projects with the purpose of a stream “restoration.” Targeted spot hardening of sewer lines can be done in the immediate area of the erosion problem – this does not justify the hundreds or thousands of feet of some stream “restorations (1500 linear feet in the case of the Glenallan Tributary between Georgian Woods Place and Glenallan Avenue).

Parks is referring to the short section just upstream from Glenallan Avenue which may very well have been a previous “WSSC infrastructure [i.e., sewer line] protection project.” Regardless of the original purpose of the riprap (rock rubble), its disruption and planned

⁸¹ Video of the Glenallan stream “restoration”
<https://www.youtube.com/watch?v=91O2bAdT8PY&feature=youtu.be>

Coalition to Stop Stream Destruction

replacement by Parks proves that the only real solution to stream erosion is upland, out-of-stream stormwater control. Anything done in the stream itself will be washed out by future storms due to uncontrolled out-of-stream stormwater from developed areas.

Any in-stream technique is doomed to failure without controlling the stressor – the upland stormwater fire hosing into the stream. (See photographs of washed-out Montgomery County and other state-wide projects in the footnoted presentation.⁸²) Parks is using disinformation to claim that the natural channel design technique is sustainable. This is clearly not the case given these examples of the cost to repair failed stream “restorations” in Montgomery County:

- Lower Booze Creek, Potomac, MD: repair cost \$3.6M⁸³
- Grosvenor Luxmanor: repair cost scheduled for \$4.8M per MoCo DEP⁸⁴
- Old Farm Creek Tributary in North Bethesda: repair cost scheduled for \$800K per MoCo DEP⁸⁵

Disturbingly, in the past Parks expressed no concern about the cost of stream “restoration” repairs during a pre-construction public tour of the Long Branch project in Takoma Park in 2021 when we pointed out that taxpayer dollars must be spent to repair or replace failed projects after the typical industry one-year guarantee runs out. Parks was asked, but refused to tell us, the length of the vendor’s guarantee on that project.

Regarding why the “natural channel design technique” is used, Palmer et. al (2014)⁸⁶, states that “The combination of training materials, the profit factor, and Rosgen’s charismatic personality has contributed significantly to the heavy reliance on the NCD [natural channel design] approach by practitioners in the private sector.” They also said that “...the data we assembled (Table 2) suggest [these techniques] are often ineffective in stabilizing channels when stability is the primary goal.”⁸⁷

An unanswered question is: who is paying for the section of the project meant to protect WSSC sewer lines and who will pay for the repairs when it is again washed out? Is it WSSC, DEP, or Parks?

⁸² Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

⁸³ Per DEP, <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Presentation.pdf>

⁸⁴ <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/grosvenor-presentation-wildwood-manor.pdf>

⁸⁵ <https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/restoration/oldfarm-creek-neilwood/WRE12-26%20Old%20Farm%20Creek%20Public%20Meeting%20Presentation%20Final.pdf>

⁸⁶ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269.

(<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

⁸⁷ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269.

(<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

Coalition to Stop Stream Destruction

“The use of placed rock with geotextile materials is a proven stream restoration practice to stabilize banks and prevent further erosion from uncontrolled urban runoff.”

Comment: This is disinformation. The published research⁸⁸ and photographic documentation of washed-out projects in Montgomery County and around the state⁸⁹ prove that this is false.

Parks fails to disclose from the public that the “geotextile materials” being used is actually plastic sheeting which will break down into microplastics. (See photographs from the Glenallan site in other comments below).

“In the video, you can observe individually selected, large rocks being precisely placed in the channel by skilled operators to protect the stream bed and banks while redirecting powerful storm flows into designated scour pools at the center of the channel, thus reducing bank stress.”

COMMENT: It is false that this project will “protect the stream bed and banks” by reducing bank stress.” While some rocks are precisely placed, others are dumped directly from dump trucks into the stream channel. Regardless of the precision of some rock placement or the random dumping of tons of rock rubble into the stream bed, the science and photographic documentation⁹⁰ show that these techniques are failing in Montgomery County and around the state. The photographs of failed projects below show that bank stress is not reduced – the “precisely placed” rocks have been dislodged and the banks behind them have been eroded.

⁸⁸ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024 (https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing) – see list of published papers.

⁸⁹ Ibid

⁹⁰ Ibid

Coalition to Stop Stream Destruction



(Above: Cabin John Creek, Bethesda)

Coalition to Stop Stream Destruction



(Above: Long Branch, Takoma Park)

Per Palmer et. al (2014)⁹¹, “Less than half of these projects showed improvements in channel stability compared with preresoration regardless of how stability was measured and even though many of the projects involved the use of large boulders or other materials to hold the banks in place.”

“The riffle grade control structures are constructed not of uniform dumped riprap, but of a carefully selected gradation of stone and sand, including native bed material. This material matrix was deliberately sized to withstand storm flows while providing oxygenating riffle habitat for ecological development.”

COMMENT: It is disinformation that this project will “withstand storm flows.” First of all, regardless of its detailed composition, the video shows rubble being dumped into the stream. Second, these projects do not work per the published science and documentation of washed-

⁹¹ Palmer, M. A., K. L. Hondula, and B. J. Koch, University of MD, 2014, “Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals,” Annu. Rev. Ecol. Evol. Syst. 2014. 45:247-269.
(<https://akottkam.github.io/publications/Palmerpublications/Palmer2014a.pdf>)

Coalition to Stop Stream Destruction

out projects in Montgomery County⁹² (see scientific references and photographs in a presentation⁹³).

Third, if this project was designed to “withstand storm flows,” for how many years is the vendor’s guarantee. Parks has refused to divulge this information for the Long Branch project.

Fourth, according to a 2021 paper by Dr. John Field⁹⁴, fluvial geomorphologist with Field Geology Services, for the City of Alexandria on the topic of raising a stream channel such as the Glenallan tributary,

- “There is no guarantee that the imported fill’s pollutant levels will not match or exceed those of the natural bank soils, which the City claims to be the source of pollutants reaching Chesapeake Bay.”
- “The fill will completely bury and kill the existing ...aquatic ecosystem of macroinvertebrates, amphibians, and fish....”
- “Due to the cutting of mature trees, “the City’s ability to achieve its goal of preserving and enhancing aquatic and riparian ecology... will have already been lost for decades, and perhaps permanently.”
- “The City also will fail to achieve its goal of reducing sediment flows into Potomac River and Chesapeake Bay. ...channel incision and widening have occurred in response to the extensive development in the watershed and to establish a new equilibrium condition. Adding fill to the channel runs directly against this natural response to urbanization: After decades of naturally reducing its gradient through incision, the filled-in, elevated streambed will produce a steeper channel that will increase (not decrease) the stream’s capacity to carry sediment. The stream’s erosive energy will be rejuvenated and, as a result, Taylor Run will move sediment more efficiently towards Chesapeake Bay.”
- “Further, the fill will replace the material that has taken decades to erode away, making sediment available to wash downstream again. As the proposed design does not address the excess runoff responsible for the incision and widening, the fill’s long-term fate will ultimately be the same: The stream will once again work toward a configuration in equilibrium with the urbanized watershed, eroding the added material until channel stability is reached. This exact scenario has already played out in Strawberry Run, which was “restored” several years ago through a similar “Natural Channel Design” project. Simply put, sediment should not be added to the stream if the goal is to reduce the amount of sediment being carried to the Bay.”

From a 2020 paper by Field⁹⁵ for an Arlington County stream “restoration”:

- “Why, then, is the sediment that has taken decades to wash downstream now being replaced with imported fill? The long-term fate of the fill will invariably be similar to

⁹² Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

⁹³ Ibid

⁹⁴ Field, John, 2021, “Analysis of the Stream “Restoration” Design for Taylor Run in Alexandria, VA”

⁹⁵ Field, John, 2020, “Analysis of the Stream Restoration Design of Donaldson Run Tributary B in Arlington, VA”

Coalition to Stop Stream Destruction

previous soils eroded away given that implementation of the project will have no effect on the high volume of runoff emanating from the urbanized watershed. Simply changing the form (i.e., width, slope, and sinuosity) of the channel as proposed in the restoration design does not change the process at the root of the problem.”

- “The addition of fill, therefore, achieves exactly the opposite result of the project’s goal to reduce downstream sediment transport towards Chesapeake Bay.”
- “In addition, the fill added to the existing channel will be far more erodible compared to the cohesive native soil, so is more likely to be removed in years rather than decades.”
- “Put simply, why add sediment to reduce sediment, especially if the project goals are less likely to be achieved?”

Also, per Field (2020)⁹⁶,

- “The numerous boulder step structures are justified as “grade controls” (i.e., to prevent downcutting of the channel) and habitat features.”
- “The large rock, although not explicitly stated, is essentially being used to armor or lock the proposed design channel in place in direct contradiction to the basic tenets of Natural Channel Design (Rosgen, 2011). As a result, the use of large rock in the design is a tacit acknowledgement that the proposed project cannot function as a geomorphically “stable” channel. By creating a static rather than a stable channel with the freedom to adjust its position over time, several potential problems are likely to arise if the project is implemented as designed.”

Per Field (2021)⁹⁷,

- “Boulder steps naturally form on steep mountain streams but their use in Taylor Run, where the “restored” stream is to be filled with fine sediment, will accelerate failure of the project (as described in Section 4.1 above) and prevent attainment of the City’s goals”
- “When water flows hit the point of contact between large, hard boulders and the fine, erodible sediment surrounding them, the stream will preferentially and aggressively scour the finer sediments in the bed or banks of the channel in a manner akin to the scouring that creates deep pools around bridge abutments and piers (Raudkivi and Ettema, 1983). As the boulder steps will sit on “footer” boulders set beneath the channel bed (Web citation 3, Design drawing DET-01), undermining of the structures is less likely (yet still possible) than the “outflanking” of the structures – that is lateral erosion around the boulder steps. Such outflanking occurred in the channel constructed as part of the previous Strawberry Run “restoration” (Figure 8) and at a project on Donaldson Run in Arlington County (Figure 11).”
- “The repeated failure of boulder structures, when implemented in fine-grained bank sediments and streambeds, extends beyond these two local examples (Miller and

⁹⁶ Ibid

⁹⁷ Field, John, 2021, “Analysis of the Stream “Restoration” Design for Taylor Run in Alexandria, VA”

Coalition to Stop Stream Destruction

Kochel, 2010) and indicates they will be problematic if used on Taylor Run. Given the preferential scouring that occurs around boulders, the boulder-step structures on Taylor Run will provide numerous locations where the “restored” stream structure will begin to unravel, and ultimately will propel the widespread failure described in Section 4.1 above. Consequently, the ability to sustain the project’s desired end state will be greatly compromised, not enhanced, by using boulders to create step-like features.”

Although Fields’ analyses were for streams in Northern Virginia, hopefully Parks agrees that the same physics of fluvial geomorphology apply in Montgomery County as in Arlington County and the City of Alexandria.

Documented photographic evidence in Montgomery County and other parts of the state⁹⁸ prove that these projects do not “withstand storm flows” and are being washed out. Taxpayer dollars must then be spent to repair or replace them because the typical industry stream “restoration” guarantee is only for one year.

Examples of the cost to repair failed stream “restorations” in Montgomery County include:

- Lower Booze Creek, Potomac, MD: repair cost \$3.6M⁹⁹
- Grosvenor Luxmanor: repair cost scheduled for \$4.8M per MoCo DEP¹⁰⁰
- Old Farm Creek Tributary in North Bethesda: repair cost scheduled for \$800K per MoCo DEP¹⁰¹

“Riffles are not lined with any plastic or geotextile underneath to ensure groundwater interaction along the stream channel.”

COMMENT: This is disinformation meant to imply that *no* plastic sheeting is being used at all. Parks is trying to obfuscate our previous comment that was meant to simply point out that plastic sheeting was being used in this project, not exactly where it was being placed along its entire 1500 foot length. The following photographs taken on 11/16/2024 clearly shows that black plastic fabric (circled in red) is being used in this project.

⁹⁸ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

⁹⁹ Per DEP, <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Presentation.pdf>

¹⁰⁰ <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/grosvenor-presentation-wildwood-manor.pdf>

¹⁰¹ <https://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/restoration/oldfarm-creek-neilwood/WRE12-26%20Old%20Farm%20Creek%20Public%20Meeting%20Presentation%20Final.pdf>

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The following on site photograph shows a roll of the plastic material that is being used. It is labeled GT180, 180" x 300':

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This product, SKAPS GT-180, is a needle-punched nonwoven geotextile made of 100% virgin polypropylene per the web site <https://skaps.com/products/geotextile-resources/skaps-gt180/>

Like other projects in the county and around the state, as this project is washed out and the plastic is exposed to air and light, it will degrade into microplastics. See photos of stream “restoration” failures that exposed plastic fabric¹⁰² including the photos below from Snakeden Branch in Potomac and Annapolis Landing in Anne Arundel County, and a photo which is a proposed mitigation site for the I-495 and I-270 widening.

¹⁰² in the presentation

https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing

Coalition to Stop Stream Destruction



(Above: exposed plastic fabric at Snakeden Branch, Potomac)

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(Above: stream “restoration” failure in Annapolis Landing, Anne Arundel County; photo by Arundel Rivers Federation, Testimony on HB 942 on March 3, 2023)

Coalition to Stop Stream Destruction



(Above: from 9/2/2022 on a tributary to Great Seneca Creek in the area south of Suffolk Terrance)

“These practices have been thoughtfully designed to both withstand the unnatural storm flows caused by urban runoff while mimicking elements of an unaltered aquatic ecosystem to promote ecological function.”

COMMENT: This is demonstrably false. First, photographic documentation from around the state show that these practices are being washed out by urban runoff. Please refer to photographs¹⁰³ of failed stream “restorations” in Montgomery County and other jurisdictions.

Second, refer to the quotes from papers from fluvial geomorphologist John Field about the instability of such practices.

¹⁰³ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024
(https://drive.google.com/file/d/1dos8SmOF5_evul8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

Coalition to Stop Stream Destruction

Third, the published science¹⁰⁴ which analyzed over 700 stream “restorations” concludes that these projects do not work to either stabilize streams, improve water quality, or improve ecological function. Montgomery County DEP has admitted that none of their past 56 projects starting in 1992 have improved stream ecology.

Unfortunately, Parks has never posted any results of their stream “restorations” to back up their assertions. Thus, there is no scientific basis for the assertion that stream “restorations” “promote ecological function.”

Fourth, the typical industry stream “restoration” guarantee is only for one year because they know the susceptibility of these projects to being washed out by storm events. After the guarantee period is over, taxpayer dollars must then be spent to repair or replace these damaged projects.

“Stream restoration plays a critical role in mitigating the impacts of urban development on our waterways,”

COMMENT: This is disinformation. It is the standard claim of the \$25 billion stream restoration industrial complex and those who are either ignorant of the science or simply choose to ignore the science. Parks, MoCo DEP, the permitting agencies (MDE and USACE), and the industry would like us to believe that the damage done at a site of urban development is balanced (or zeroed-out) by a “restoration” at a site such as the Glenallan Tributary – a zero-sum game. The problem is that the science and empirical evidence shows that so-called stream “restorations” do not actually work. (See scientific references and photographs of failed projects in Montgomery County and other jurisdictions in footnoted presentation¹⁰⁵). What actually happens is environmental damage at both the development site *and* environmental damage at the mitigation site. The result is a net decrease in natural areas, forests, and wildlife habitat.

To put it a different way, two wrongs don’t make a right.

“but it is only one of the many tools Parks uses to improve water quality and habitat. Other tools include impervious removals, storm drain daylighting, outfall restoration, soil deconsolidation, riparian enhancements, headcut (areas of severe vertical erosion) stabilization, stormwater retrofits of existing untreated impervious surfaces (micro-bioretenion practices, bio-swale conversions, landscape infiltration, etc.), native plantings, micro-topography restoration, and other techniques to capture and treat runoff while enhancing ecological systems.”

COMMENTS: It is encouraging that Parks is aware of the range of non-destructive stormwater control practices. But stream “restoration” is the one tool that should not be in their toolkit since it is the only destructive stormwater control practice in their list. It should be abandoned

¹⁰⁴ Listed in Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

¹⁰⁵ Bawer, K., 2024, “Stormwater Control & Stream Restoration: What Works and What Does Not,” presentation for Rockville Science Day: April 21, 2024

(https://drive.google.com/file/d/1dos8SmOF5_evuI8Y_CWuUMVNHZoVP1Sf/view?usp=sharing)

Coalition to Stop Stream Destruction

in favor of all the other tools which are out-of-stream, non-destructive stormwater control projects that control stormwater runoff before it can firehose into streams.

“Our team of experts - which includes biologists, engineers, ecologists, arborists, urban foresters, and environmental construction specialists - works hard to ensure that these projects are designed and implemented thoughtfully, with careful consideration of both their impacts and benefits.”

COMMENTS: While there might have been a “careful consideration of both their impacts and benefits,” the facts on the ground speak for themselves – stream “restorations” are destroying our stream valleys. Parks’ comment is quite Orwellian given what is shown in the video of the Glenallan project¹⁰⁶ - it is all destruction. We are being asked reject the evidence of our eyes. This is the very definition of greenwashing and disinformation.

[illegible]

For background information, here are a few links:

- Video of Gaithersburg Solitaire Court stream “restoration”:
<https://www.youtube.com/watch?v=NvTvPnG6Qs8>
- Video of the Glenallan stream “restoration”
<https://www.youtube.com/watch?v=91O2bAdT8PY&feature=youtu.be>
- Link to presentation that gives some background information on stormwater control and the damage done by stream “restorations” for stormwater control. It includes references to scientific papers:
https://drive.google.com/file/d/1dos8SmOF5_evul8Y_CWuUMVNHZoVP1Sf/view?usp=sharing
- Link to comments on Maryland Department of Transportation’s State Highway Administration’s draft MS4 permit that includes generic comments on stream “restorations”:
<https://drive.google.com/file/d/1cncF1E32jrxdpqd5ghzZ2AsJjWt5P0O/view?usp=sharing>
- Link to comments on Chesapeake Bay Program update (“Beyond 2025”) to Chesapeake Bay Watershed Agreement:
<https://drive.google.com/file/d/1dBBEVLkvRCCKOlaw4RRDOU0B35exnS64/view?usp=sharing>
- Link to March 2024 letter that debunks Montgomery County Department of Environmental Protection’s false claims [about stream “restorations”](#):
<https://drive.google.com/file/d/1-e85ZiQfYBrySjswPgk61dnJlxTwYmMw/view?usp=sharing>

¹⁰⁶ Video of the Glenallan stream “restoration” near Brookside Gardens at <https://www.youtube.com/watch?v=91O2bAdT8PY>

Coalition to Stop Stream Destruction

Appendix 8: Proposed bill to encourage stormwater control on private property

A common false claim is that there is not enough upland space for out-of-stream stormwater control projects. While this may be true of public lands in a particular area, there is a tremendous amount of stormwater runoff from private property.

While there are laws requiring stormwater management for new development, there are no similar laws for existing private development which is a major source of urban and suburban stormwater runoff.

Below is a proposed bill to encourage stormwater control on existing private property.

Urban and Suburban Stormwater Management for Existing Private Development (Urban Stormwater Management Act)

FOR the purpose of requiring that a certain amount of a jurisdiction's Municipal Separate Storm Sewer System (MS4) Permit credits be obtained by managing stormwater using upland (out-of-stream) practices on existing private development to accelerate restoration of the Chesapeake and Atlantic Coastal Bays and their watersheds.

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

THERE IS A RECOGNIZED NEED TO ACCELERATE RESTORATION OF THE CHESAPEAKE AND ATLANTIC COASTAL BAYS AND THEIR WATERSHEDS BY THE USE OF PRACTICES that:

- Are constructed outside of natural areas such as stream valleys
- Are constructed for existing private development
- Are cost effective
- Can address the root cause of stream erosion outside of streams
- Are approved by Maryland Department of the Environment (MDE) for MS4 permit credits
- Provide a range of co-benefits such as recharging groundwater, reducing urban flooding, reducing heat islands, increasing property values, providing urban green spaces, and protecting natural areas, and
- Are located in and provide benefits to overburdened or underserved communities.

Upon the renewal of their next MS4 Permit, the MS4 Permit holder shall:

- Obtain at least 10% (for example) of their MS4 Permit credits from projects using MDE-approved out-of-stream (upland) practices (as found in the MDE document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated (2021), <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/F>

Coalition to Stop Stream Destruction

[inal%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf](#)) for existing private development, both residential and commercial.

- Ensure that these projects constructed for private development meet or exceed current local code requirements for new development stormwater management and also meet or exceed MS4 permit requirements.
- Ensure that these projects to be constructed on private property are voluntarily approved by the owner and are constructed at no cost to the private property owner.
- Ensure that a public outreach program is documented, publicly available, and executed by the jurisdiction to identify willing private property owner participants including an explanation that there will be no cost to the private property owner.
- Ensure that at least half of the projects are located in and provide benefits to overburdened or underserved communities.
- Ensure that if the 10% MS4 permit credit target is not reached after exhausting the identified pool of voluntary private property participants, the jurisdiction shall document as part of their next MS4 Permit application how the jurisdiction will enhance its outreach efforts for the next MS4 permit to identify more willing private properties owners.
- Ensure that inspection requirements meet MS4 permit requirements and the same local code requirements as for new development stormwater management.
- Ensure that if inspections cannot be performed due to the requirement for additional inspectors, that a request for deferral is submitted to MDE. MDE may approve the request until such time as staffing will be adequate as documented by the jurisdiction's next Financial Assurance Plan.
- Ensure that maintenance requirements meet MS4 permit requirements.

Fiscal impact (expenditures and revenue):

- State Effect: No expenditures by the state. No additional effort by MDE to certify a jurisdiction's MS4 permit.
- Local Effect: There would be no additional, and possibly lower, expenditures for meeting the MS4 permit construction costs if more of these upland cost-effective projects are used. (Reference: average state-wide costs per 2022 MDE Annual Report on Financial Assurance Plans and the Watershed Protection and Restoration Program, <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>)

Inspection requirements could warrant an increase in the number of inspectors, but the cost savings of these upland project types compared to stream restorations could pay for the additional hires.