

**HB 942, Wetlands and Waterways Program – Authorizations for
Stream Restoration Projects**

ENT Committee Hearing on 3/3/2023

Corrections to Industry (and Other) Misinformation

Installment #1 (in Black and/or noted as “i1”) – sent 3/8/2023

Installment #2 (in Blue and/or noted as “i2”) – sent 3/13/2023

Installment #3 (in Red and/or noted as “i3”) – sent 3/23/2023

NOTE: because of the vast amount of misinformation, half-truths, and greenwashing put forth in both written and oral testimony, this document will be sent out in installments so as to provide Delegates at least some information before the ENT voting.

By

Kenneth Bawer

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Bill HB 942, Wetlands and Waterways Program – Authorizations for Stream Restoration Projects

<https://mgaleg.maryland.gov/2023RS/bills/hb/hb0942f.pdf>

COMMENTS ON “FISCAL AND POLICY NOTE”

THIS SECTION NOT COMPLETE

COMMENTS ON ORAL TESTIMONY

THIS SECTION NOT COMPLETE

Oral testimony recording link from March 3

https://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=ent&clip=ENV_3_3_2023_meeting_1&ys=2023rs from 1:43:50 to 3:43:00

Oral testimony in response to Delegate Stewart’s question about Hilderbrand’s research.

Recording at:

https://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=ent&clip=ENV_3_3_2023_meeting_1&ys=2023rs .

Below corrects an outright falsehood perpetrated by the industry during the 3/3/2023 ENT hearing. I reached out to Dr. Robert Hilderbrand for his comments on industry statements about his research.

Per Del. Stewart’s specific question during the testimony on HB 942, Stream Restorations about Robert Hilderbrand’s research, I contacted Bob (I do know him on a first name basis) and asked him to comment on the industry employees’ criticism that his study only looked at one type of stream restoration (which they mischaracterized as a specific type of “stream armoring”, and which is not even an MDE-recognized stream restoration technique) which did not represent the whole universe of practices that are used in stream restoration. In fact, the universe of stream restorations techniques is a very small universe, consisting of only 3 different techniques: Prevented Sediment (Natural Channel Design (NCD)), Hyporheic Exchange (wet channel Regenerative Stormwater Conveyance (RSC)), and Floodplain reconnection. In his response (see his note below), Bob states that he looked at both NCD and RSC which encompasses 66% of the “universe” of stream restoration techniques - hardly a tiny subset of techniques as was stated by the industry person. Furthermore, NCD is the most common technique used for stream restorations.

Bob refuted their assertion saying, “...many of the projects I looked at were not what I would consider armoring projects. However, they did armor specific areas of channel banks in order to prevent erosion,” which is done in virtually all NCD projects. His paper (Hilderbrand, Robert H., et. al.,

“Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf) says, “There simply were few ecological differences between restored and unrestored sites. In fact, the unrestored sections upstream were often ecologically better than the restored sections or those downstream of restorations.”

Bob says that his more recent paper found “that restorations usually end up with no better, and often worse, benthic macroinvertebrate responses [which is an industry-standard for measuring in-stream biology] than were the stream left alone.” This paper looks at mostly, but not exclusively, at NCD-type projects.

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My note to Robert Hilderbrand on 3/5/2023: “At about 3:09:45, Delegate Stewart referred to the Chesapeake Bay Journal from 2020 in which you are quoted about your research showing the lack of biological uplift. He asked the industry reps for their comments. The industry panelist was dismissive of your study as being specifically applicable only to a type of stream armoring where you have not reduced the level of flow [their words, and I'm not sure what that means], and that you were only looking at a subset of very specific practices that do not represent the whole universe of practices that are used in stream restoration. Would you be able to comment on that? They seem to be saying, for example, that you only looked at projects using e.g., Natural Channel Design, but not Regenerative Stormwater Conveyance or Floodplain Reconnection, or vice versa, whatever the case may be. Is that a valid criticism of that study. As I recall, the article and your comments were based on your paper, Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020.”

Robert Hilderbrand’s response on 3/6/2023:

“Hi Ken,

Feel free to pass this along to anyone.

My study looked at 2 types of restorations: natural channel design (NCD) in piedmont streams and both Regenerative Stormwater Conveyance (RSC) and NCD in the coastal plain. Technically, they are correct that I did not explore the entire universe of techniques, but RSC and NCD approaches represent the vast majority of restorations in the area to my knowledge. I'm not fluent in restoration engineer/practitioner speak so there may be differences in opinion here, but many of the projects I looked at were not what I would consider armoring projects. However, they did armor specific areas of channel banks in order to prevent erosion. I would like to know how their approach substantively differs from those that I and others have studied. I would also like to see strong evidence, and not just anecdotes, that their proposed method works in most of their restoration projects.

My more recent work (see attached final report) examined what we can realistically expect from a stream restoration given the landscape setting of each specific project. That is, we need to be realistic and cannot expect a restoration to produce a really high quality biotic response if it is in a highly urbanized watershed. My research corrected for the watershed impervious surface cover (ISC) to

forecast what we can realistically expect given the ISC levels. It turns out that most (not all, but most of them) restored streams achieved lower benthic invertebrate scores than unrestored streams having similar levels of ISC in their upstream catchment. It's a pretty technical research project, but the gist is that restorations usually end up with no better, and often worse, benthic macroinvertebrate responses than were the stream left alone. The projects were almost exclusively in Montgomery County and were mostly NCD-type projects for which the county had monitoring data. I looked at all restorations that had monitoring data in the county."

COMMENTS ON WRITTEN TESTIMONY

THIS SECTION NOT COMPLETE

(i2) West Montgomery County Citizens Association (WMCCA), by Kenneth Bawer
See attachment

(i3) Arundel Rivers Federation, by Elle Bassett

ARF: "Every time we have a large rain event, large amounts of stormwater runoff will rush down these pathways, carrying nutrient and sediment pollution to our waterways and further eroding the already degraded stream."

FACT: While this is a true statement, ARF ignores the fact that we must control this stormwater at its source. Failure to do so has resulted in stream restoration blowouts as documented by photographs in the West Montgomery County Citizen Association (WMCCA) written testimony (attached).

ARF: "Stream restoration is a tool that repairs stream habitat while also benefiting downstream water quality."

FACT: This is a false statement. First, stream restorations do not repair stream habitat since scientific research shows that they do not result in improvements to in-stream biology. ^{1 2 3 4}

¹ Hilderbrand, Robert H., et. al., "Quantifying the ecological uplift and effectiveness of differing stream "restoration" approaches in Maryland," Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

² 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)

³ 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)

⁴ 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/>)

Second, the benefit to downstream water quality is only temporary since stream restorations do not control the source of stream erosion - out-of-stream stormwater runoff. Therefore, stream restorations are being blown out rendering them useless. See photographs of disrupted stream restorations in the West Montgomery County Citizen Association (WMCCA) written testimony (attached).

ARF: "According to the Department of the Environment, the goals and objects for any stream restoration project include improving stream habitat, preventing erosion, restoring hydrology, reconnecting floodplains, reducing sediment and nutrient delivery downstream, improving water quality, removing invasives and replacing with riparian vegetation with natives, and re-establishing continuous stream channels.¹ (1 Maryland Department of the Environment. Stream Restoration.

https://mde.maryland.gov/programs/Water/Pages/Stream_Restoration.aspx)"

FACT: This is misleading since it misquotes the given web site. The implication of the misquote is that every stream restoration has those goals and objectives and that those goals and objectives are obtainable for every stream restoration. However, the web site actually says that, "The goals and objectives for any stream restoration project vary," and that the list is only possible, neither assured nor applicable to all projects. What is conveniently ignored is the scientific research that show that stream restorations do not result in improvement of in-stream biology.⁵

ARF: "We have seen instances of large-scale stream restoration often associated with mitigation work result in extensive tree clearing. While HB 942 had good intentions of trying to prevent those types of projects, it invertedly will make *all* stream restoration projects difficult to implement, including those projects that seek to provide improved habitat and downstream water quality improvements."

FACT: This is a false statement. Bill HB 942 will only make more difficult those stream restorations that propose to clear cut large areas of stream-side forests.

ARF: "Stream restoration is one of the most cost effective restoration tools we have to meet these targets and goals..."

FACT: This is a false statement with no evidence provided. First, while cost is always a legitimate concern, we are struck by the lack of data any used to bolster this assertion. One jurisdiction (Montgomery County DEP) admitted that they have never done fair cost comparisons, i.e., they have never asked for quotes on large numbers of out-of-stream projects in order to receive the cost benefits from "volume discounts" (i.e., economies of scale)⁶. In fact, on a statewide basis MDE data (per the 2022 FAP⁷) 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

⁵ Ibid (see the four footnotes immediately above)

⁶ Department of Environmental Protection presentation to Montgomery County Water Quality Assurance Group on 4/12/2021.

⁷ Watershed Protection and Restoration Program - Financial Assurance Plans, <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

(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 blown out and repair is extremely expensive.

Second, the benefit of a stream restoration is entirely a short-term, temporary decrease in the amount of stream bank erosion. ARF's own written testimony shows a photograph of a blown out stream restoration with a large section of exposed plastic geotextile fabric at Annapolis Landing in Riva, MD that had to be repaired. The WMCCA's written testimony (see attachment) and the Expert Panel Report⁸ both show photographs of stream restorations destroyed by rainstorms due to the failure to control stormwater from imperious surfaces such as roads and roofs. For example, the Lower Booze Creek stream restoration in Potomac originally cost \$700,000. After its completion, the Montgomery County Department of Environmental Protection web site states, "Storm damage occurred very soon after construction, initiating structural failures." The repair work cost an additional \$3.6 million.

ARF: "Maintaining tree habitat is already a goal of stream restoration design."

FACT: This is a misleading statement. The documented photographic evidence (see WMCCA testimony attached) clearly shows that the goal of maintaining tree habitat is being missed by a mile. The photographs show many stream restoration projects where large areas of stream-side forests have been clearcut.

ARF: "...it is important to note that some tree species will likely naturally change due to the desired change in hydrology from the project. For example, a tree that has grown with dry roots may not adjust well to the reconnected floodplain and wetland-like conditions of the now frequently flooded habitat around a stream restoration project. That tree will likely die and be replaced with a tree that prefers wet roots."

FACT: This is a false statement. The two faulty premises are that 1) the stream restoration must be done, and 2) that all stream restorations involve reconnecting floodplains.

First, stream restorations never have to be done if the cause of stream erosion is eliminated by controlling stormwater runoff outside of the streams themselves using green stormwater infrastructure such as rain gardens and bio-retentions.

Second, not all stream restorations involve flood plain reconnection since not all streams have flood plains. The other methods of stream restoration are Natural Channel Design and Regenerative Stormwater Conveyance, neither of which change the hydrology of a stream valley into a "now frequently flooded habitat."

⁸ "Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed," Approved by the Urban Stormwater Work Group of the Chesapeake Bay Program Date: June 18, 2019, Figure 1, https://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2019/07/Approved-Verification-Memo-061819.pdf

ARF: “Upland projects alone will not restore eroded streams and crediting should be based on scientifically proven outcomes.”

FACT: This is a false statement with no supporting evidence. However, there is scientific evidence by Fraley McNeal, et. al.⁹ that after controlling stormwater upland, stream banks will self-recover. But the industry doesn’t like passive, self-recovery solutions because there is no money to be made. We agree that crediting should be based on scientifically proven outcomes, and the science shows that stream restorations do not result in uplift of in-stream biology (see references above). We also believe that crediting should withheld when empirical evidence shows that stream restoration projects are blown out and become ineffective (see photographs from WMCCA testimony attached).

ARF: “Often times, there is not adequate space for upland work to be accomplished and maintenance of upland projects has proven to be a challenge.”

FACT: This is a false statement with no supporting evidence. Any required maintenance of upland projects, most of which are easily accessible from road-sides, is less challenging than maintenance of stream restoration projects which can be deep in natural stream valleys. In fact, the photographic evidence (see WMCCA written testimony attached) is that many stream restoration projects are simply not maintained after they are blown out.

ARF: “Upland projects are often more costly for less nutrient and sediment reduction benefits. This will further delay Maryland in reaching our restoration goals.”

FACT: This is a demonstrably false statement. This is a demonstrably false statement. On a statewide basis, MDE data (per the 2022 FAP¹⁰) shows that there are 33 different types of out-of-stream practices (such as rain gardens and bio-swales) that are cheaper to build (on a cost per impervious acre treated basis) than stream “restorations.” This is not even a comparison of the lifecycle cost, or total cost of ownership (TCO), which is the sum of construction, maintenance, repair, and replacement costs. Lifecycle cost comparisons would probably tip the scales even further in favor of upland practices due in part to the fact that stream restorations are being blown out and repair is extremely expensive as documented in WMCCA’s written testimony (attached). Also not analyzed by MDE is a quantification of the value of lost or gained ecosystem services (for example, trees have been shown to reduce air conditioning expense).

(i3) Maryland Department of Natural Resources (DNR) by Emily Wilson,

⁹ “The Self-Recovery of Stream Channel Stability in Urban Watersheds due to BMP Implementation,” by Lisa Fraley McNeal, Bill Stack, et. al., March 2021, Prepared by the Center for Watershed Protection, Inc.
https://cbtrust.org/wp-content/uploads/Self_Recovery_of_Stream_Channel_Stability_Final_Draft_03-23-21.pdf

¹⁰ Watershed Protection and Restoration Program - Financial Assurance Plans,
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

DNR: “DNR is currently working with MDE on the issues described within HB 942 through a study organized and led by MDE based on requirements from the last session. We are an active participant in this study, and believe it is a good avenue with diversified input to investigate and seek solutions to stream restoration needs and concerns expressed in HB 942.”

FACT: We are also an active participant in the referenced study, required by 2022 HB869, and disagree with the above comment that this study “is a good avenue with diversified input to investigate and seek solutions to stream restoration needs and concerns expressed in HB 942”

Unfortunately, the HB 869 study is flawed from the start and will not result in an unbiased report. Any results, conclusions, and recommendations from the HB 869 2022 study will be potentially biased by MDE’s current mindset in favor of stream restorations and will be tightly controlled by MDE. Study participants were told during the 12/13/2022 meeting that participants will not be able to vote on any aspects of the final report and that the final report will be authored solely by MDE (per Kenneth Bawer, a participant in the study representing West Montgomery County Citizens Association). While MDE says that it may consider input from across the regulated community, MDE has stated that they are not bound to accept any recommendations from the study group members. Thus, MDE is free to “listen and ignore.” Another problem is that since MDE is apparently satisfied with current stream restoration construction techniques and the MS4 permit crediting schedule, this study is being controlled by a group arguably with a predisposition towards maintaining the status quo. The study is therefore flawed from its inception due to this potential conflict of interest. The only way to ensure that the results of a study are based solely on science would be to have a truly independent panel of scientist in fields such as fluvial geomorphology, ecology, botany, etc. who conduct a study based on the science, not based on considerations of the for-profit, engineering-based stream restoration industry or entrenched MDE thinking.

(i3) Maryland Department of Transportation (MDOT), by Mitch Balwin & Pilar Helm

MDOT: “Stream restoration projects are one of the most effective methods for SHA to mitigate highway runoff impacts and improve the surrounding environment.”

FACT: No evidence has been provided to support this assertion. This is a demonstrably false statement. The scientific evidence is that stream restorations do not result in biological

uplift.^{11 12 13 14} The WMCCA written testimony (included in this document) provides photographic evidence that stream restorations are being blown out and require expensive repairs due to the lack of out-of-stream stormwater control.

MDOT: “It also happens to be one of the most cost-effective ways for SHA to obtain and use stormwater management credits.”

FACT: No evidence has been provided to support this assertion. This is a demonstrably false statement. On a statewide basis, MDE data (per the 2022 FAP¹⁵) shows that there are 33 different types of out-of-stream practices (such as rain gardens and bio-swales) that are cheaper to build (on a cost per impervious acre treated basis) than stream “restorations.” This is not even a comparison of the lifecycle cost, or total cost of ownership (TCO), which is the sum of construction, maintenance, repair, and replacement costs. Lifecycle cost comparisons would probably tip the scales even further in favor of upland practices due in part to the fact that stream restorations are being blown out and repair is extremely expensive as documented in WMCCA’s written testimony (attached). Also not analyzed by MDE is a quantification of the value of lost or gained ecosystem services (for example, trees have been shown to reduce air conditioning expense).

MDOT: “SHA has a successful model of using land owned by a third party to restore streams to their more natural state.”

FACT: No evidence has been provided to support this assertion. To say that the result is to “restore streams to their more natural state” is demonstrably a false statement. WMCCA’s written testimony shows photographic evidence of clear-cut stream-side forests and rocks which are dumped into the streams by most of these projects. And, as stated above, stream “restorations” do not result in biological uplift, and they are being blown out and require expensive repairs due to the lack of out-of-stream stormwater control.

MDOT: “This practice allows SHA to acquire credits without the time consuming and expensive process of buying and maintaining more right-of-way.”

¹¹ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

¹² 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)

¹³ 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)

¹⁴ 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/>)

¹⁵ Watershed Protection and Restoration Program - Financial Assurance Plans, <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

FACT: No evidence has been provided to support the assertion that their practice is less time consuming and less expensive than alternative costs including total life cycle costs (total cost of ownership). In fact, MCDOT would not be required to buy and maintain more right-of-way. For example, MCDOT could request that the US Army Corps of Engineers allow upland, out-of-stream stormwater control projects as currently allowed by the Federal Mitigation Rule.¹⁶

MDOT: “This method is also proven to improve water quality and mitigate stormwater in areas that have greater needs.”

FACT: This is a false statement. As stated above, stream “restorations” do not result in biological uplift, and they are being blown out and require expensive repairs due to the lack of out-of-stream stormwater control.

(i3) Stormwater Partners Network of Montgomery County (SWPN), by Eliza Cava et. al.

SWPN: “...a fair number of stream restorations are undertaken precisely for infrastructure reasons, and then the MS4 credit generated is a by-product.”

FACT: This is a false statement. Stream restorations are never undertaken for infrastructure reasons. They are done either for MS4 permit credits, TMDL credits, or for mitigation projects. Projects done to protect sewer lines, bridge abutments, or roads for example are called infrastructure protection projects or infrastructure repair projects – these projects do not qualify for MS4 permit credit per MDE’s Accounting Guidance document: “...projects that are primarily designed to protect public infrastructure by bank armoring or rip rap do not qualify for a credit.”¹⁷

SWPN: “While in an ideal world every single stream restoration project would be intended and designed to achieve biological uplift, the reality is that it is very hard to ensure and demonstrate uplift in all cases, even when a stream restoration may be the most appropriate tool for a given site.”

FACT: This is a false and misleading statement. First, if MDE does not believe that biological uplift can be achieved by a specific project, MDE should not grant a permit for that project in the first place. In fact, stream restorations done for mitigation projects are required to demonstrate biological uplift as required by the Federal Mitigation Rule. Therefore, MDE should also require biological uplift for stream restorations done for the MS4 permit. A stream restoration is a stream restoration. To say that “it is very hard to ensure and demonstrate uplift in all cases” implies that uplift can be demonstrated in most or at least some cases.

¹⁶ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

¹⁷ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, page 69
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio n%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

Nothing could be further than the truth. The scientific reports find that stream “restorations” rarely result in biological uplift.^{18 19 20 21}

Second, stream “restoration” is never the most appropriate tool for a given site. There is ample documentation (see the included testimony from WMCCA) of the destruction caused by so-called stream “restorations” and the post-installation failure of these projects which fail to address the cause of stream erosion – stormwater fire-hosing into streams from impervious surfaces such as roofs and roads.

SWPN “...stream restorations are currently exempt from many aspects of the Forest Conservation Act. Some of our Network members believe this exemption should be reversed, while others feel that would create an unworkable burden for even highly needed stream restoration projects.”

FACT: This is a misleading statement. There is no such thing as “highly needed stream restorations projects.” What are truly highly needed are non-destructive, out-of-stream stormwater control projects. The exemptions from the Forest Conservation Act are shameful and result in the clear-cutting of stream-side forests as documented by photographs in the WMCCA written testimony.

(i2) American Council of Engineering Companies/MD (ACEC/MD), by Christopher Costello

ACEC: “Our concern and reason for opposing HB 942 is the bill’s duplication of existing Maryland Department of the Environment (MDE) efforts to protect and improve Maryland’s wetlands and waterways. Here are several examples duplicates exiting efforts [sic]:

Section 5-203.2 (A) duplicates the requirements in HB 869 from 2022, which also requires a review of restoration projects. This report is due in 2024;”

FACT: This is not true. Unfortunately, the HB 869 study is flawed from the start and will not result in an unbiased report. Any results, conclusions, and recommendations from the HB 869 2022 study will be potentially biased by MDE’s current mindset in favor of stream restorations and will be tightly controlled by MDE. Study participants were told during the 12/13/2022 meeting that participants will not be able to vote on any aspects of the final report and that the final report will be authored solely by MDE (per Kenneth Bawer, a participant in the study

¹⁸ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

¹⁹ 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)

²⁰ 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)

²¹ 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/>)

representing West Montgomery County Citizens Association). While MDE says that it may consider input from across the regulated community, MDE has stated that they are not bound to accept any recommendations from the study group members. Thus, MDE is free to “listen and ignore.” Another problem is that since MDE is apparently satisfied with current stream restoration construction techniques and the MS4 permit crediting structure, this study is being controlled by a group arguably with a predisposition towards maintaining the status quo. The study is therefore flawed from its inception due to this potential conflict of interest. The only way to ensure that the results of a study are based solely on science would be to have a truly independent panel of scientist in fields such as fluvial geomorphology, ecology, botany, etc. who conduct a study based on the science, not based on considerations of the for-profit, engineering-based stream restoration industry or entrenched MDE thinking.

ACEC: “Section 5-203.2 (B) (1) ignores the existing professional studies and reports from experts in every scientific field, as well as the extensive modeling and data collection that have provided the best possible scientific information for the needs of the Department.”

FACT: This is not true. First, HB 942 does not change the credit generation practices for stream restoration. Second, MDE relies in part on the Chesapeake Bay Program’s (CBP) Expert Panel Reports²² for its scientific information. The panel members as a whole did not have expertise in all the disciplines required to evaluate the total impact of stream restorations including, but not limited to, fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, habitat ecology, total environmental impact analysis, and ecosystem services analysis. Therefore, MDE does not have, nor use, “the best possible scientific information.”

The approval process for the CBP Expert Panel reports is clearly not objective. 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 vested interest in ensuring that the crediting calculations maximized their profits. This may have been a blatant 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.

ACEC: “Maryland’s current laws and regulations provide more than sufficient guidance and protection relative the stream restoration, such that enacting HB 492 will serve no additional benefit and may create problems for the Department.”

FACT: This is a false statement. This is clearly not the case given the photographic evidence provided in WMCCA’s written testimony of the destruction of our natural resources by stream restorations. To say that “enacting HB 492 will serve no additional benefit” is absurd, and to say that enacting HB 492 “may create problems for the Department” is sowing unsubstantiated FUD (fear, uncertainty, and doubt) in addition to sounding like a threat.

²² 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>

(i3) Baltimore County

Baltimore Co.: “Currently, project criteria and eligibility requirements for all water quality Best Management Practices (BMPs) that may be utilized for compliance with State-issued Municipal Separate Storm Sewer System (MS4) permits and local and State Total Maximum Daily Load (TMDL) implementation plans are developed and updated through the Chesapeake Bay Program (CBP).”

FACT: This is not a true statement. MDE has added BMPs to the list of MS4 permit-eligible practices independent of the CBP’s Expert Panel reports. The CBP Expert Panel reports are recommendations, not mandates.^{23 24}

Baltimore Co.: “The CBP determines crediting protocols by convening Expert Panels, comprised of scientists and representatives from local, state and federal governments, consulting firms and academic institutions, to digest best available science on each BMP.”

FACT: This is a misleading statement. The approval process for the CBP Expert Panel reports is clearly not objective. These reports were not created by an independent panel of scientists with no financial conflicts of interest. The CBP Expert Panel²⁵ included employees of for-profit engineering companies (which the above statement calls “consulting firms”) who are primarily engineers, not scientists, and who may have had a vested interest in ensuring that the crediting calculations maximized their profits. This may have been a blatant 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.

Baltimore Co.: “As local jurisdictions implement and permit stream restoration projects, biological uplift must be considered in concert with other important outcomes of such projects, including erosion and flood reduction and water quality improvement.”

FACT: This is a false statement. It implies that there must be a balance between biological and physical outcomes. For stream restorations done for MS4 permits, there is absolutely no requirement that biological uplift must be considered. This is precisely why HB 942 adds the requirement that biological uplift must be a stated goal of any stream restoration. In fact, stream restorations done for mitigation projects are already required to demonstrate biological uplift as required by the Federal Mitigation Rule²⁶. Therefore, MDE should also

²³ Per Lee Currey, Director, MDE Water and Science Administration, 3/22/2023 meeting with Sierra Club, Blue Water Baltimore, Chesapeake Legal Alliance, The Nature Conservancy, and others

²⁴ 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>

²⁵ 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>

²⁶ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

require biological uplift for stream restorations done for the MS4 permit. A stream restoration is a stream restoration.

Baltimore Co.: “Functional improvements in the hydrologic, hydraulic, geomorphologic and physiochemical components of a stream ecosystem are just as important as biological uplift.”

FACT: This is a false statement. Biological uplift is arguably the most important component of any attempted improvements to a stream ecosystem. In fact, biology is at the top of the commonly used “stream function pyramid” model²⁷. The absence of biology is the definition of a dead stream.

Baltimore Co.: “Unfortunately, in many streams in more highly developed watersheds, salt from road runoff, extreme temperatures, and a lack of source population may inhibit full restoration of biotic communities and habitat.”

FACT: We agree. This is exactly why stream restorations should not be done in these situations. Rather than further destroy streams in “highly developed watersheds”, salt from roads should be controlled by out-of-stream road-side stormwater control projects. Extreme temperatures should not be exacerbated by stream restorations which clear-cut stream-side forests. Once out-of-stream stressors such as road salt have been removed, the lack of a source population of in-stream organisms can be rectified by transplantation of those organisms from other locations.

Baltimore Co.: “Existing regulations include tree loss minimization, project monitoring, and public notice.”

FACT: This is a misleading statement. First, existing tree regulations are clearly inadequate since they allow the clear cutting of large areas of stream-side forests as documented in the WMCCA testimony (attached).

Second, MDE’s current monitoring plan requirements are wholly inadequate and are not even a firm requirement. Currently, no matter how many stream restorations a jurisdiction does for MS4 permit credits, only one stream restoration project is required to be monitored. Adding insult to injury, the monitoring results from that one project can be totally useless due to inadequate MDE regulations. For example, the one stream restoration project out of many that Montgomery County chose to monitor is called the Breewood project. Unfortunately, it is impossible to attribute the results of the Breewood stream restoration monitoring to the stream restoration project itself. This is because the instream monitoring station is downstream from not just the stream restoration but also other stormwater control practices including Green Streets projects such as bioretentions and pervious pavement. But even doing one stream restoration monitoring for an MS4 permit is not a firm requirement. MDE actually allows jurisdictions to completely opt out of that requirement by instead paying into a pool of money which is used to fund research.

Third, current public notice and public participation are wholly inadequate. The reason there has not been massive outcry about “restoration” projects is that the public notification

²⁷ <https://stream-mechanics.com/stream-functions-pyramid-framework/>

process is broken. See detailed comments in our response to the Chesapeake Watershed Restoration Professionals testimony below.

Baltimore Co.: "...changes to the criteria and crediting of BMPs should be undertaken in a scientifically rigorous manner. In the Chesapeake region, we are fortunate to have the CBP and the scientific community of many academic, research, and practicing organizations working on these very issues.

FACT: This is a misleading statement. First, HB 942 does not change the credit generation practices for stream restoration. Second, MDE relies in part on the Chesapeake Bay Program's (CBP) Expert Panel Reports²⁸ for its scientific information. However, the panel members as a whole did not have expertise in all the disciplines required to evaluate the total impact of stream restorations including, but not limited to, fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, habitat ecology, total environmental impact analysis, and ecosystem services analysis.

The approval process for the CBP Expert Panel reports is clearly not objective. 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 vested interest in ensuring that the crediting calculations maximized their profits. This may have been a blatant 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.

(i3) Baltimore Mayor's Office (BMO)

BMO: "All of the Maryland approved BMPs, including stream restorations, and their corresponding credits, are based on science...."

FACT: This is a demonstrably false statement. Current crediting of BMPs in the CBP Expert Panel reports is based more on engineering than on science. 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 vested interest in ensuring that the crediting calculations maximized their profits. This may have been a blatant 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.

In addition, the current impervious acre credits in the Expert Panel report are not scientifically defensible. As explained more fully in the comments on MDE's written testimony (below), the

²⁸ 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>

Expert Panel is so unsure of the results of their estimation calculations that they take what falls out of the bottom and randomly cut it by 50% “...to account for the presumed efficiency of stream restoration practices.”²⁹ So much for being based on science. As far as we know, there is no peer reviewed scientific literature to support using the Expert Panel recommendations.

BMO: “Only practices with natural design elements are creditable. These nature-cased elements aid in the restoration of the habitat in both the channel and floodplain, increasing the ecosystem services of the riparian area.”

FACT: This is a false statement. First, there is no such thing as “natural design elements” in any of MDE’s documents. There is, however, a stream restoration technique called Natural Channel Design even though it is a highly destructive practice. The other two types of stream restoration are called Regenerative Stormwater Conveyance and Floodplain Reconnect.

Second, there is no scientific evidence that stream restorations “aid in the restoration of the habitat in both the channel and floodplain, increasing the ecosystem services of the riparian area.” To the contrary, the scientific literature shows that stream restorations rarely, if ever, result in a stream’s biological uplift.^{30 31 32 33} Finally, we are not aware of any scientific research demonstrating that stream restorations result in “increasing the ecosystem services of the riparian area.” To the contrary, the documented photographic evidence (see WMCCA’s testimony attached) shows that many stream restorations clear-cut riparian forests and scrape the forest floor down to bare earth. The projects result not in an increase, but a total destruction of any previously existing ecosystem services.

BMO: “Most stream restoration projects include an evaluation of potential upland BMP installation.”

FACT: This is a false statement without any supporting evidence. This is neither an MDE requirement nor a standard practice.

BMO: “The opportunities [for upland BMP installation] are limited due to land ownership, access, and ability to intercept stormwater runoff.”

²⁹ 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. 8; <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

³⁰ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

³¹ 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)

³² 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)

³³ 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/>)

FACT: This is a false statement without any supporting evidence. We have never seen hard data to back up this claim.

BMO: “The types of upland BMPs that would be implemented for MS4 permit compliance (impervious surface restoration) would be designed for qualitative control (retaining the volume of the first inch of rainfall which is considered the most polluted); these BMPs would not be sufficient to provide quantitative control to reduce the continued degradation of the streams during 2 to 10-year storms.”

FACT: This is a false and misleading statement. First, MDE’s Accounting Guidance document gives bonus credit for controlling more than one inch of rainfall (up to three inches).³⁴ Second, the purpose of BMPs implemented for MS4 permit compliance has nothing to do with controlling stormwater volume (quantity). MS4 permit BMPs are only for qualitative (pollutant) control. However, there is scientific evidence to show that upland BMPs can reduce and eliminate stream degradation. Research by Fraley McNeal, et. al.³⁵ showed that after controlling stormwater upland, outside of streams, stream banks will self-recover. There is nothing to prevent a jurisdiction from “over-engineering” a BMP to control more stormwater volume.

BMO: “The inference of the destructive nature of stream restoration projects referred to in HB 942 is predominately related to the impacts of forests. ...[and] will result in the removal of some tree canopy during construction.”

FACT: The destructive nature of stream restoration projects is not an “inference” – it is a well-documented fact. See the photographs in the WMCCA testimony attached that show large areas of tree canopy that were clear-cut for numerous stream restoration projects throughout several Maryland jurisdictions.

BMO: “It is important to note, however, that addressing stream conditions such as scouring, stream bank erosion and undercutting, and connecting a more natural stream channel to its floodplain, helps to support a healthy forest environment.”

FACT: This is a false statement with no supporting evidence. First, stream restorations do not address “scouring, stream bank erosion and undercutting” since the root cause of stream erosion in developed areas – stormwater fire hosing into streams from impervious surfaces such as roads and roofs – has not been controlled. The result is that stream restoration projects are being destroyed after construction as documented in WMCCA’s attached testimony. Repairs to blown out stream restorations are very costly.

³⁴ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, November 2021,” p.28, 29
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

³⁵ “The Self-Recovery of Stream Channel Stability in Urban Watersheds due to BMP Implementation,” by Lisa Fraley McNeal, Bill Stack, et. al., March 2021, Prepared by the Center for Watershed Protection, Inc.
https://cbtrust.org/wp-content/uploads/Self_Recovery_of_Stream_Channel_Stability_Final_Draft_03-23-21.pdf

Second, it is demonstrably false that these projects result in “a more natural stream channel” – see the photographs in the WMCCA’s testimony attached showing tons of rock debris dumped along stream edges and into streams which block the movement of fish and other aquatic organisms.

Third, the implication that all streams have, or had, floodplains is false. Not all streams have floodplains, so it may not be advisable to create a floodplain where none existed before. This could lead to the destruction of existing non-floodplain ecosystems and their ecosystem services. For example, per Rod Simmons, City of Alexandria Natural Resources Manager, regarding a globally and state rare Acidic Seepage Swamp along the south bank of Taylor Run at Chinquapin Park in the City of Alexandria, “Despite some protection from encroachment, [a stream restoration using the technique called] natural channel design will destroy this ground-water controlled, non-alluvial wetland by creating an artificial floodplain were none naturally exists and using the non-alluvial wetland as an alluvial habitat to be washed out by overland flooding regimes.”³⁶

Finally, the statement that a stream restoration “helps to support a healthy forest environment” is completely fabricated. One has only to see the destruction caused by stream restorations as documented with photographic evidence in the attached WMCCA testimony to dispel this notion.

BMO: “The forest assessments and mitigation efforts for stream restoration projects follow the state’s forest conservation requirements and the MS4 Accounting Guidance document.”

FACT: We agree with this statement. That is precisely why HB 942 was introduced – to correct the deficiencies in existing law.

BMO: “...HB 942 would put in place punitive measures for any waterways and wetlands permit issued by MDE solely for stream restoration projects that are being done as part of an MS4 permit.”

FACT: This is a false statement. HB 942 does not include any punitive measures. This common-sense bill will protect our streams by reducing the causes of stream degradation and help improve stream restoration projects if they are done.

BMO: “Maryland’s MS4 Accounting Guidance document already states that before credits are granted, the restoration project will need to meet post-construction monitoring requirements, exhibit successful vegetative establishments, and have undergone initial maintenance.”

FACT: This statement is misleading. First, there is currently no requirement to demonstrate biological uplift during post-construction monitoring – HB 942 adds this. Second, MDE’s current monitoring plan requirements are wholly inadequate and are not even a firm requirement. Currently, no matter how many stream restorations a jurisdiction does for MS4 permit credits, only one stream restoration project is required to be monitored. Adding insult to injury, the monitoring results from that one project can be totally useless due to

³⁶ “Native Biodiversity Conservation and Restoration Challenges in Urbanized Areas,” Rod Simmons presentation to Pocahontas Chapter of the Virginia Native Plant Society, February 4, 2021.

inadequate MDE regulations. For example, the one stream restoration project out of many that Montgomery County chose to monitor is called the Breewood project. Unfortunately, it is impossible to attribute the results of the Breewood stream restoration monitoring to the stream restoration project itself. This is because the instream monitoring station is downstream from not just the stream restoration but also other stormwater control practices including Green Streets projects such as bioretentions and pervious pavement. But even doing one stream restoration monitoring for an MS4 permit is not a firm requirement. MDE actually allows jurisdictions to completely opt out of that requirement by instead paying into a pool of money which is used to fund research.

(i1) [Chesapeake Watershed Restoration Professionals \(CWRP\)](#), by Liam O’Meara

NOTE: CWRP is essentially a lobbying arm of the stream restoration industry including construction companies and mitigation bankers. Their web site does not list its members.

CWRP: “This bill is unnecessary in that the issues raised are already adequately addressed in current requirements.”

FACT: This is a demonstrably false statement given the documentation in the West Montgomery County Citizens Association’s (WMCCA) written testimony³⁷ and the Chesapeake Bay Program’s Expert Panel Report³⁸, Figure 1) that stream restorations are being blown-out by rainstorms due to uncontrolled or inadequately controlled out-of-stream runoff and 2) the scientific reports that stream restorations do not result in biological uplift. (See the comments below on MDE’s written testimony).

CWRP: “Furthermore, there is already a study underway as directed by HB896 [sic] of the 2022 legislative session to study how MDE reviews and permits ecological restoration projects.”

FACT: Unfortunately, the HB 869 study is flawed from the start and will not result in an unbiased report. Any results, conclusions, and recommendations from the HB 869 2022 study will be potentially biased by MDE’s current mindset in favor of stream restorations³⁹ and will

³⁷ See attachment below. Not yet posted to the Maryland General Assembly site at <https://mgaleg.maryland.gov/mgaweb/Legislation/Details/hb0942>

³⁸ “Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed,” Approved by the Urban Stormwater Work Group of the Chesapeake Bay Program Date: June 18, 2019 (https://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2019/07/Approved-Verification-Memo-061819.pdf)

³⁹ For example, Director Lee Currey of MDE’s WSA touted the benefits of the flood plain reconnection type of stream restoration (during a 2/21/2023 meeting with Delegate Boyce, Ken Bawer, Blue Water Baltimore, and Chesapeake Bay Foundation) while ignoring their obvious destructive nature. In addition, MDE ignored the common-sense recommendations of the Choose Clean Water Coalition that MS4 permits require a greater emphasis on out-of-stream stormwater control by “...requiring some minimum amount of green infrastructure to be undertaken by jurisdictions to comply with these newest permits,” that “...MDE cap the amount of credits a single jurisdiction can generate toward compliance with their [stream] restoration[s]...,” and that stream restorations “...demonstrate biological uplift as proposed by the Expert Panel Report,” per CCWC’s Jan. 20, 2021 letter to Mr. Raymond Bahr, MDE, WSA.

be tightly controlled by MDE. Study participants were told during the 12/13/2022 meeting that participants will not be able to vote on any aspects of the final report and that the final report will be authored solely by MDE (per Kenneth Bawer, a participant in the study representing West Montgomery County Citizens Association). While MDE says that it may consider input from across the regulated community, MDE has stated that they are not bound to accept any recommendations from the study group members. Thus, MDE is free to “listen and ignore.” Another problem is that since MDE is apparently satisfied with current stream restoration construction techniques and the MS4 permit crediting schedule, this study is being controlled by a group arguably with a predisposition towards maintaining the status quo. The study is therefore flawed from its inception due to this potential conflict of interest. The only way to ensure that the results of a study are based solely on science would be to have a truly independent panel of scientist in fields such as fluvial geomorphology, ecology, botany, etc. who conduct a study based on the science, not based on considerations of the for-profit, engineering-based stream restoration industry or entrenched MDE thinking.

CWRP: “On changing restoration criteria: The Chesapeake Bay Program has utilized expert scientific panels composed of the leading scientists and practitioners that study, collect data, and model current stream restoration and techniques. Through the work of these dedicated professionals, the credit generation practices for stream restoration have been refined several times through exhaustive research and the utilization of the most modern data available. This process is rigorously scientific and objective in nature, and it should be kept that way.”

FACT: This is a false and misleading statement. First, HB 942 does not change the credit generation practices for stream restoration. Second, the CBP’s approval process is neither “rigorously scientific” nor objective: it was not created by an independent panel of scientists with no financial conflicts of interest. The CBP Expert Panel included employees of the for-profit, engineering-based stream restoration industry who are primarily engineers, not scientists, and who may have had a vested interest in ensuring that the crediting calculations maximized their profits. This may have been a blatant 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.

Furthermore, the panel members as a whole did not have expertise in all the disciplines required to evaluate the total impact of stream restorations including, but not limited to, fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, habitat ecology, total environmental impact analysis, and ecosystem services analysis.

CWRP: “On disincentivizing stream restoration as a BMP: Any impervious acre credit to any BMPs must be scientifically defensible and be determined through the currently accepted process for determining pollution reduction. Current crediting of BMP’s has undergone extensive research and peer review.”

FACT: This is a misunderstanding of HB 942 since it does not require disincentivizing steam restoration via changes to impervious acre credits. Plus, as noted above, current crediting of BMPs was based on input from industry employees having a potential conflict of interest. In

addition, the current impervious acre credits are not scientifically defensible. As explained more fully in the comments on MDE's written testimony (below), the Expert Panel is so unsure of the results of their estimation calculations that they take what falls out of the bottom and randomly cut it by 50% "...to account for the presumed efficiency of stream restoration practices."⁴⁰ So much for being scientifically defensible. As far as we know, there is no peer reviewed scientific literature to support using the Expert Panel recommendations.

CWRP: "No BMP practice can simply be incentivized over others if they do not result in greater pollutant load reductions."

FACT: This is a misunderstanding of HB 942 since it is not prescriptive about how MDE should incentivize out-of-stream (upland) alternative BMPs (project types). There are many ways to incentivize BMPs besides pollutant load reductions. The provision of additional incentives for upland stormwater control may require some out-of-the-box thinking. For example, DEP could award bonus credit for the rainfall depth treated for structural practices to greater than the current **three inch maximum⁴¹. Or, MDE could put an MS4 permit cap on the percentage of credits that can be achieved via stream restorations and a minimum percentage for out-of-stream stormwater control credits. MDE could incentive upland stormwater control by combining certain MS4 Permits, such as Montgomery County and Montgomery Parks. Currently, Montgomery Parks has no ability to do upland stormwater control at its source when the stormwater comes from outside their parks in the county itself. Combining MS4 permits for the county and parks would eliminate that finger pointing. Another idea: MDE could recommend laws requiring existing buildings to meet new-build stormwater control requirements upon property transfer (i.e., at the time of sale) which would be eligible for MS4 permit credits.**

This bill does not require, nor suggest, that credits for efficiencies be changed. However, MDE currently has a list of approved Green Infrastructure Practices that are eligible for a bonus "Green Stormwater Infrastructure Credit."⁴² Additional bonus credits could be awarded to all non-stream "restoration" practices to incentivize out-of-stream projects. **Alternatively, MDE could award LESS credits for non-GSI practices. Or, MDE could reduce the credits available for mitigation or MS4/TMDL purposes in proportion to the loss of forest and trees.**

It should be noted that the current credits for stream restoration are numbers developed with the help of industry employees with a potential conflict of interest as described above.

⁴⁰ 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. 8; <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

⁴¹ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, November 2021," p.28, 29 <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

⁴² Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, November 2021," p.28 <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

Another way to incentivize upland, out-of-stream, practices is to make the current key criteria that stream restoration projects must meet⁴³ more stringent.

For example, the “geomorphic evidence of active stream degradation” could be made an absolute requirement, and its proof could be mandated by actual long-term measurements of bank erosion instead of allowing use of the theoretical modeling methodology of BANCS/BEHI. The highly unreliable BANCS method to estimate stream bank erosion is not reproducible. The Expert Panel report says of the BANCS method that these theoretical calculation tools are “...susceptible to high variability when performed by different practitioners in the field.”⁴⁴ If a measurement cannot be reproduced by different people using the same methodology, it is scientifically useless.

Also, the current key criteria could prohibit stream restorations in use Class IV: Recreational Trout Waters and Use Class IV-P: Recreational Trout Waters and Public Water Supply⁴⁵ streams.

To incentivize upland, out-of-stream practices, MDE could require that the maximum amount (maximum extent practicable (MEP)) of out-of-stream practices be built before a stream restoration could be considered for any given sub-watershed.

CWRP: “On defining geographic limits for restoration: The Maryland Department of the Environment (MDE) and the US Army Corp of Engineers (USACE) currently require resource impacts to be mitigated within an 8-digit Hydrologic Unit Code (HUC) Watershed. This is consistent with how resource impacts and associated mitigation are managed across the entire US.”

FACT: Per the written testimony of the Stormwater Partners Network, “This clause [of HB 942] is clearly meant to apply to mitigation banks.... These types of mitigation banks are permitted by the U.S. Army Corps of Engineers, in partnership with MDE. Under the Mitigation Rule,³ the Army Corps is already directed to prioritize mitigation within the same watershed where impacts occur, but has great latitude to define the scale of watershed to be used as well as to use their best judgment if they find in-watershed mitigation to be impractical. ... The bill’s sponsors could consider requiring that the Department and the Army Corps require that the applicant mitigate their impacts in the same HUC-12 or, at largest, HUC-10 sub-watersheds where the impacts occur.”

CWRP: “On requiring biological uplift: Currently, the MDE and USACE require that stream restoration projects result in ecological uplift through use of the Stream Functions Pyramid. Biological improvement is Step 5 of the Pyramid.”

⁴³ Ibid, Appendix H, p. 69.

⁴⁴ 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>

⁴⁵ Maryland's Designated Uses for Surface Waters, https://mde.maryland.gov/programs/Water/TMDL/WaterQualityStandards/Pages/wqs_designated_uses.aspx

FACT: This is purposely misleading statement that industry employees make repeatedly. While stream restorations done for mitigation projects are required to demonstrate biological improvement, those done for MS4 permits are NOT required to demonstrate biological uplift. MDE should also require biological uplift for stream restorations done for the MS4 permit since a stream restoration is a stream restoration.

CWRP: “Consequently, the existing process requires that practitioners create the conditions [emphasis added] for biological uplift to occur as regional environmental conditions allow.

FACT: This is a misleading statement. Only stream restorations done for mitigation projects are required to show biological uplift. However, the existing MS4 permit process does NOT require that practitioners even create the conditions for biological uplift to occur, nor does it require that biological uplift actually occurs for MS4 permit credit to be granted. Again, if mitigation stream restoration projects require biological uplift, then so should MS4 permit projects as well as other TMDL projects.

CWRP: “It is not practical to require biological uplift of in-stream biology as there are limiting factors that cannot be controlled on the stream restoration sites. These ubiquitous negative externalities include road salt pollution, offsite barriers to wildlife migration, extreme temperatures, and general poor water quality.”

FACT: This is a false statement. The Federal Mitigation Rule⁴⁶ already requires that stream restorations done for mitigation projects require biological uplift of in-stream biology. Since there have already been numerous stream restoration mitigation projects, the assertion is demonstrably false.

In addition, the Expert Panel report states that “Stream restoration is a carefully designed intervention to improve the hydrologic, hydraulic, geomorphic, water quality, and biological condition of degraded urban streams, and must not be implemented for the sole purpose of nutrient or sediment reduction.”⁴⁷ Therefore, a stream restoration cannot proceed if biological uplift is not possible.

CWRP: “It is absolutely the goal of stream practitioners to improve biological function through in-stream habitat creation, but it may take decades, if ever, for recolonization to occur of imperiled populations of aquatic dependent wildlife.”

FACT: This is a misleading statement. Currently, per MDE the only goal of stream restorations done for MS4 permits is to prevent stream-bank erosion. The purpose of HB 942 is to add the

⁴⁶ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

⁴⁷ 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,” page 17; <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

goal of biological uplift. If mitigation stream restoration projects currently require biological uplift, then so should MS4 permit projects as well as other TMDL projects. In addition, this bill has nothing to do with recolonization of imperiled populations.

CWRP: “On minimization of tree impacts: A requirement already exists for stream restoration projects to achieve no-net-loss of forest cover and to minimize tree impacts to the extent possible.”

FACT: This is a misleading statement. In practice, any no-net-loss requirement currently results in the clear-cutting of mature stream-side forests, as well documented in the WMCCA written testimony, and replacing them with young saplings that will take decades to achieve the pre-construction forest cover. Thus, during the decades it takes for young tree growth to reach the no-net loss cover target, we have lost decades worth of mature forest habitat and carbon sequestration which exacerbates global warming, perhaps permanently. Plus, “no-net-loss of forest cover” only refers to trees and ignores the loss of the forest as an interdependent community of understory shrubs, wildflowers, and animals which will take even longer recover, if ever.

Photographic evidence in the WMCCA written testimony also shows the complete lack of critical root zone protection in many projects which will lead to eventual death of “spared” trees.

CWRP: “The implementation of mulch and mat roads through the woods to gain access to the stream corridor are specifically designed to protect the critical root zones of trees.”

FACT: This is a misleading statement. There is ample photographic evidence in the WMCCA testimony that not all projects use mulch and mat roads. Many projects run heavy equipment directly on bare forest floor soil. Plus, photographs of the Solitaire Court project in Gaithersburg show trees with vertical wood scape protectors tied to tree trunks – a clear indication that heavy construction equipment is close enough for someone to be concerned about scraping the tree trunks. The tens of feet of critical root zone protection is non-existent.

CWRP: “Additionally, the forest impacts of restoration are almost always temporary, but the protection of the restored riparian corridor is permanent.”

FACT: This is a false statement. It takes decades or hundreds of years for clear-cut forests to recover, if they ever do. Plus, the science shows that biological uplift is rarely, if ever, achieved. It is also demonstrably false that stream restorations are permanent. The WMCCA written testimony provides photographic evidence that stream restorations are being blown out and require expensive repairs due to the lack of out-of-stream stormwater control. The Lower Booze Creek stream restoration in Potomac originally cost \$700,000. After its completion, the Montgomery County Department of Environmental Protection web site states, “Storm damage occurred very soon after construction, initiating structural failures.” The repair work cost an additional \$3.6 million. Since stream restoration companies typically only guarantee their work for one year, when they are destroyed after that it is the taxpayers who pick up the bill.

CWRP: “On delaying credit certifications by 10 years: A full decade of monitoring before any credits are issued would render ecological restoration completely unworkable for the purposes of the

Chesapeake Bay Program and severely limit what restoration work is even possible in the State of Maryland.”

FACT: We agree, as does the bill’s sponsor, and suggest that credits be released according to a timed schedule determined by MDE.

CWRP: “On public notice: Currently, public hearings can be requested and are granted. We absolute do not oppose public hearings, but they are expensive and if they are required for every project, this will add significant expense and time for any applicant, the majority of whom are local governments, non-profits, and government agencies. Furthermore, the planning and implementation of public hearings are time consuming for state agencies and would require more staff to manage.”

FACT: This is a false statement. Zoom meetings cost a trivial amount of money and a small amount of time. While it is true that public hearing can be requested, the problem is that most residents are rarely aware of these projects and therefore don’t request public hearings. The reason there has not been massive outcry about “restoration” projects is that the public notification process is broken.

While bill HR 942 is not prescriptive, one would hope that MDE would be begin by requiring that more than immediate property owners or communities be notified about projects since restoration sites are often in natural areas used by entire jurisdictions. Plus, the impact of projects can be felt far outside the immediate community as evidenced by the fact that stream restorations are meant to impact the Bay. Communities should also be notified of projects proposed for private property since the impact of projects is never confined solely within private property boundaries.

One could envision that MDE and local jurisdictions could be required to notify all interested parties who have requested, via a web site for electronic sign-up, to be notified via email of requests for stream restoration project permits. Such web sites could allow interested parties to be notified of all projects statewide, or just for selected jurisdictions. Note that the USACE already has a web site to sign-up for permit requests at <https://www.nab.usace.army.mil/Missions/Regulatory/Public-Notices> . MDE has a site where notices are posted at <https://mde.maryland.gov/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/publicinformation.aspx>, but it is almost impossible to find with a common sense web search and it doesn’t link to any of the detailed project proposal information (it does provide an email address to request more information, but why not cut out the middle man?). Furthermore, all public comments should be responded to and all public comments as well as department and permittee responses could be posted on the web site without the need for a public information act request by the public. Currently, these comments all go into a black hole.

If there are any vendor (permittee) modifications to their proposals, either required by MDE, the USACE or for any other reason (except for trivial changes such as fixing typographic errors), the modified proposal could be posted and interested parties could be notified. Non-trivial changes could trigger another round of public hearings and comments. Additional rounds of public hearings and comments could be held as additional, non-trivial modifications

to proposals are made. Expediting any review process only serves to limit government oversight and citizen review, input, and comment. Quality proposals should not require modifications post submittal.

The public could be kept informed of the status of each permit via postings to the web site. This site could show all the steps in the process leading up to a final determination (i.e. permit approval or denial or withdrawal by the applicant) and where in this process each permit currently resides. The web site should allow the public to register for a tracking account which would push update notifications to the registrant. This could be patterned after the MD General Assembly website (<https://mgaleg.maryland.gov/mgawebiste/>) where one can register to be notified of progress on a bill of interest.

CWRP: “This would slow, not just stream restoration projects, but the review, approval, and enforcement of all projects that require MDE approvals. This does not just include housing and commercial development but importance public works projects such as schools, transportation improvements, and affordable housing.”

FACT: This is both a false and a self-serving statement by a for-profit industry. This is a bill about stream restorations. HB 942 has absolutely nothing to do with housing and commercial development or schools, transportation improvements, and affordable housing. Expediting any review process only serves to limit government oversight and citizen review, input, and comment. If the concern is that the speed of permitting for stream restorations could be slowed by necessary oversight, the US Army Corps of Engineers has the authority to authorize out-of-stream projects for mitigation per the Federal Mitigation Rule.⁴⁸

CWRP: “For transparency and efficiency CWRP recommends the adoption of a permit tracking system similar to the Virginia Department of Environmental Quality’s Permitting and Evaluation Platform.

FACT: The Virginia site (<https://portal.deq.virginia.gov/peep-search>) is only for businesses, not for use by the general public. Per this site, “This system is intended solely for users conducting business with DEQ for the purposes of fulfilling obligations under a permit, regulation, statute or other DEQ program. Those who need to review DEQ records for other purposes may submit a request under the Freedom of Information Act.” This is hardly a model of transparency.

(i2) Ecosystem Investment Partners (EIP), by Nicholas Dilks

EIP: “Impervious acre crediting methodologies used to meet the TMDL already make scientific benefit comparisons between upland BMPs versus stream restoration, and there is strong evidence that while both provide benefit, stream restoration is far more cost effective.”

⁴⁸ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

FACT: This is a false statement that “Impervious acre crediting methodologies used to meet the TMDL already make scientific benefit comparisons between upland BMPs versus stream restoration.” First, the CBP Expert Panel crediting methodologies use engineering methodologies filled with assumptions not scientific analyses. Missing from the crediting methodologies are comparisons of the total impact of stream restorations versus upland, out-of-stream projects including, but not limited to fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, identification and habitat expertise, total environmental impact analysis, and ecosystem services analysis. This type of analysis has never been done.⁴⁹

Second, the statement that both upland BMPs and stream restorations “provide benefit” is demonstrably false given the photographs showing the destruction caused by stream restorations in WMCCA’s written testimony (see attachment). In the case of stream restorations, the cure is far worse than the disease. In addition, the scientific evidence is that stream restorations do not result in biological uplift.^{50 51 52 53}

Third, there is no “strong evidence that while both provide benefit, stream restoration is far more cost effective.” In the case of stream restorations, the benefit is entirely a short-term, temporary decrease in the amount of stream bank erosion. The WMCCA’s written testimony (see attachment) and the Expert Panel Report⁵⁴ both show photographs of stream restorations destroyed by rainstorms due to the failure to control stormwater from impervious surfaces. For example, the Lower Booze Creek stream restoration in Potomac originally cost \$700,000. After its completion, the Montgomery County Department of Environmental Protection web site states, “Storm damage occurred very soon after construction, initiating structural failures.” The repair work cost an additional \$3.6 million.

⁴⁹ Per Dr. Sujay Kaushal, University of Maryland, on 2/16/2022 during Montgomery County Department of Environmental Protection Webinar series, <https://mygreenmontgomery.org/2021/public-invited-to-stream-restoration-webinar-series/>

⁵⁰ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

⁵¹ 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)

⁵² 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)

⁵³ 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/>)

⁵⁴ “Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed,” Approved by the Urban Stormwater Work Group of the Chesapeake Bay Program Date: June 18, 2019, Figure 1, https://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2019/07/Approved-Verification-Memo-061819.pdf

Fourth, the statement that “stream restoration is far more cost effective” is false. While cost is always a legitimate concern, we are struck by the lack of data used to bolster this assertion. One jurisdiction (Montgomery County DEP) admitted that they have never done fair cost comparisons, i.e., they have never asked for quotes on large numbers of upland projects in order to receive the cost benefits from “volume discounts” (i.e., economies of scale)⁵⁵. In fact, on a statewide basis MDE data (per the 2022 FAP⁵⁶) shows that there are 33 different types of out-of-stream projects (such as green roofs, rain gardens, and bio-swales) that are cheaper to build (cheaper 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 practices due in part to the fact that stream restorations are being blown out and repair is extremely expensive. Having said that, we certainly recognize a need to identify supplemental sources of funding for jurisdictions.

(i2) Environmental Policy Innovation Center (EPIC), by Timothy Male

Note: Although EPIC is a non-profit, apparently their staff is paid, at least in part, by advocating for and advancing “the permitting and financing of ecological restoration” projects per their web site.

EPIC: “For decades, nature-based projects and green infrastructure like stream restoration faced an uphill challenge across the country.”

FACT: This is a false characterization of steam restorations. Stream restoration is not a “nature-based” project. Stream restorations typically clearcut mature stream-side forests. Young trees are replanted but these take decades or longer, if ever, to approximate what was destroyed. The complex web of interactions between fauna, flora, geology, and hydrology in natural areas cannot be recreated by engineering projects using bulldozers, trucked-in rock rubble, and some replanted saplings.

Stream restorations are not considered “green infrastructure” by government or industry. According to MDE’s Accounting Guidance document⁵⁷, only upland out-of-stream practices are considered Green Stormwater Infrastructure (GSI). Stream restorations are not GSI.

⁵⁵ Department of Environmental Protection presentation to Montgomery County Water Quality Assurance Group on 4/12/2021.

⁵⁶ Watershed Protection and Restoration Program - Financial Assurance Plans, <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

⁵⁷ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, Table 19 on page 29 <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

EPIC: “Despite extensive science showing these approaches are a cost-effective strategy to create extensive public health and environmental benefits...”

FACT: This is a false characterization of stream restorations. First, science has nothing to do with cost-effectiveness. Cost is determined by how much profit a stream restoration company wants to make when it sells a product or service. Second, there is absolutely no evidence that stream restorations create public health benefits.

Third, on a statewide basis MDE data (per the 2022 FAP⁵⁸) shows that there are 33 different types of out-of-stream practices (such as green roofs, rain gardens, and bio-swales) that are cheaper to build (cheaper cost per impervious acre treated) than stream “restorations.” This does not even include a comparison of the lifecycle cost, or total cost of ownership (TCO), which is the sum of construction, maintenance, repair, and replacement costs. Also not analyzed by MDE is a quantification of the value of lost or gained ecosystem 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 practices due in part to the fact that stream restorations are being blown out and repair is extremely expensive as documented in WMCCA’s written testimony (attached).

Third, there is no evidence that stream restorations result in environmental benefits. The fact is that stream restorations destroy large areas of riparian forests, destroy wildlife habitat (see photographic evidence in WMCCA’s written testimony), and rarely, if ever, result in biological uplift of in-stream biology^{59 60 61 62}.

EPIC: “I understand the motivation behind this legislation. I know that you have experience with a few stream restoration projects (Montgomery County) that a small number of residents don’t like, primarily because necessary stream restoration work harms trees immediately adjacent to streams.”

FACT: This is a demonstrably false statement. Clearly, the writer does not understand the motivation behind this legislation, which is to a desire by individuals with no financial interests to enhance and protect the environment. On the other hand, we do clearly understand the motivation of the billion-dollar stream restoration industry which is to maximize their profits regardless of the environmental harm done by their projects and in

⁵⁸ Watershed Protection and Restoration Program - Financial Assurance Plans, <https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/WPRPFinancialAssurancePlans.aspx>

⁵⁹ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

⁶⁰Jepsen, 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)

⁶¹ 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)

⁶² 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/>)

spite of the scientific evidence that stream restorations do not work, either physically or biologically.

To say that “stream restoration work harms trees immediately adjacent to streams” is an understatement and is typical of industry greenwashing. We only have to believe our eyes. Please see the photographs of projects showing wide clearcut areas on both sides of streams in WMCCA’s written testimony (attached).

It is demonstrably false that there are only a few residents who are only in Montgomery County that oppose the destruction caused by stream restorations. The Montgomery Coalition to Stop Stream Destruction sent a letter to County Executive Marc Elrich on February 17, 2021 that was signed by 20 organizations and 141 individuals opposing the destruction caused by stream restorations. A group in Columbia collected 272 signatures (and counting) in opposition to a proposed stream restoration project, and the Sierra Club campaign resulted in 451 letters being sent in opposition to the proposed Columbia stream restoration - hardly just a “small number of residents” opposing these projects. Plus, the opposition went way beyond harm to trees. The opposition was to the total environmental destruction that the project would cause without even fixing the root cause of the stream erosion – uncontrolled out-of-stream stormwater.

Second, this not just a Montgomery County issue. The WMCCA written testimony (attached) provided photographic documentation of just a sampling of destructive stream restoration projects across the state including in Chevy Chase, Gaithersburg, Rockville, Potomac, Columbia, Takoma Park, Prince Georges County, Baltimore County, Charles County, Carroll County, and Anne Arundel County. This was far from an exhaustive list.

EPIC: “Some tree removal is needed because dirt needs to be shifted to fill the enormous erosion canyons that have accumulated across streams through our state and region and country.”

FACT: This is a false statement and exhibits a fundamental misunderstanding of scientific and cause-and-effect principles. First, while there are eroded sections of some streams, it is over-the-top hyperbole to call them all “enormous canyons.” Second, there is never a need to fill any gullies since there is evidence by Fraley McNeal, et. al.⁶³ that after controlling stormwater upland, outside of streams, stream banks will self-recover. But the industry does not like passive, self-recovery solutions because there is no money to be made.

Third, the dirt is usually not “shifted”, it is typically fill dirt trucked in from outside the project site with no specification of the character or origin of the fill to be used. “The fill will completely bury and kill the existing rich aquatic ecosystem of macroinvertebrates, amphibians, and fish”⁶⁴ that exists. Plus, there is typically no guarantee that the imported fill’s pollutant levels will not match or exceed those of the natural stream banks. This is important

⁶³ “The Self-Recovery of Stream Channel Stability in Urban Watersheds due to BMP Implementation,” by Lisa Fraley McNeal, Bill Stack, et. al., March 2021, Prepared by the Center for Watershed Protection, Inc. https://cbtrust.org/wp-content/uploads/Self_Recovery_of_Stream_Channel_Stability_Final_Draft_03-23-21.pdf

⁶⁴ Field, John, “Analysis of the Stream “Restoration” Design for Taylor Run in Alexandria, VA,” <https://media.alexandriava.gov/docs-archives/tes/stormwater/1taylorryunfieldanalysisofstreamrestorationdesignfieldmarch2021.pdf>

since the science of fluvial geomorphology says that the imported fill dirt will eventually be eroded out by future storms as described below.

Per Dr. John Field⁶⁵ of [Field Geology Services](#), an expert recognized by the Maryland Stream Restoration Association, "...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, [the stream] 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. [If a] 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. ...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."⁶⁶

EPIC: Those short-term aesthetic effects on trees near walking trails or public areas are real, but so is the damage that eroded, degraded streams cause to the Chesapeake Bay.

FACT: This is a false statement. First, there is no "short-term aesthetic effect" on trees that are cut down – a dead tree is a permanent effect. Second, as already described, stream "restorations" inflict much more than "short-term aesthetic effects." The clear cutting of hundreds or thousands of trees, shrubs, and other plants in a forest is much more than a "short-term aesthetic effect." It will take decades or longer for the forest to recover, if ever.

EPIC: "Once streams start eroding like this, the damage just keeps getting worse. If you don't fix them, these damaged streams will keep dumping sediment, and phosphorus and nitrogen into the Bay."

FACT: This is a false statement and shows a lack of understanding of the physical principles of fluvial geomorphology. As noted above, per Dr. John Field, "...channel incision and widening have occurred in response to the extensive development in the watershed and to establish a new equilibrium condition."⁶⁷ Thus the damage does NOT just keeps getting worse once the new equilibrium is reached or until further deepening of the channel through incision is no longer possible due to reaching hardpan or other erosion-resisting rock.

⁶⁵ "Dr. John Field has over 35 years of professional experience working on rivers in 15 states and 12 other countries worldwide. He has assessed over 1,000 miles of river and restored more than 35 miles of stream, often utilizing large wood to improve river function and aquatic habitat." From

<https://marylandstreamrestorationassociation.org/event-4932213>

⁶⁶ Field, John, "Analysis of the Stream "Restoration" Design for Taylor Run in Alexandria, VA,"

<https://media.alexandriava.gov/docs->

<archives/tes/stormwater/1taylorryunfieldanalysisofstreamrestorationdesignfieldmarch2021.pdf>

⁶⁷ Field, John, "Analysis of the Stream "Restoration" Design for Taylor Run in Alexandria, VA,"

<https://media.alexandriava.gov/docs->

<archives/tes/stormwater/1taylorryunfieldanalysisofstreamrestorationdesignfieldmarch2021.pdf>

EPIC: “Stream restoration is effective in reversing that damage and restorations prevent it from returning, keeping thousands of tons of sediment and nutrients out of the Bay for decades to come.”

FACT: This is a false statement as documented in the WMCCA written testimony showing examples of blown-out stream “restoration” projects around the region. These are very temporary, not permanent projects.

EPIC: “However, the legislation would direct you (in subsection (B)(2)(1)) to change the numbers on other projects’ nutrition labels to give them more credit. It literally says, “the Department shall provide(ing) more credits.” [sic]

FACT: This is a misunderstanding of HB 942 since it is not prescriptive about how MDE should incentivize out-of-stream (upland) alternative BMPs (project types). There are many ways to incentivize BMPs besides pollutant load reductions. The provision of additional incentives for upland stormwater control may require some out-of-the-box thinking. For example, MDE could award bonus credit for the rainfall depth treated for structural practices for greater than the current **three inch maximum⁶⁸. Or, MDE could put an MS4 permit cap on the percentage of credits that can be achieved via stream restorations and a minimum percentage for out-of-stream stormwater control credits. MDE could incentive upland stormwater control by combining certain MS4 Permits, such as Montgomery County and Montgomery Parks. Currently, Montgomery Parks correctly says that it has no ability to do upland stormwater control at its source when the stormwater comes from outside their parks in the county itself. Combining MS4 permits for the county and parks would eliminate that excuse. Another idea: MDE could recommend laws requiring existing buildings to meet new-build stormwater control requirements upon property transfer (i.e., at the time of sale) which would be eligible for MS4 permit credits.**

This bill does not require, nor suggest, that credits for efficiencies be changed. However, MDE currently has a list of approved Green Infrastructure Practices that are eligible for a bonus “Green Stormwater Infrastructure Credit.”⁶⁹ Additional bonus credits could be awarded to all out-of-stream “restoration” practices to incentivize out-of-stream projects.

It should be noted that the current credits for stream restoration are numbers developed with the help of industry employees (on CBP Expert Panels) with potential conflicts of interest as described above.

EPIC: “This legislation will take away a cost-effective, national nature-based solution as a solution to improving the Bay and making local streams and their ecosystems more resilient to climate change.”

FACT: This is a false statement. There are 33 other solutions approved by MDE that are more “cost-effective” as explained above. Stream restorations are not a nature-based solution as explained above. Stream restorations do not make “local streams and their ecosystems more

⁶⁸ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, November 2021,” p.28, 29
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio n%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

⁶⁹ Ibid, p.28

resilient to climate change.” These projects destroy natural areas and do not fix the source of stream degradation – the lack of out-of-stream stormwater control.

EPIC: “The solution isn’t to take away this [stream restoration] tool; the solution is to help more of the public understand the size and scale of the solution that you and others are wisely funding to keep them safe from climate change and to restore the Chesapeake Bay.”

FACT: This is a false statement. The author implies that the problem with stream restorations is simply the lack of public understanding. In fact, it is public understanding of the destructive nature and ineffectiveness of these projects, despite industry greenwashing, that led to this bill’s proposed revisions to stream restoration practices and the requirement to incentivize greater out-of-stream stormwater control.

EPIC: “Voluntary opportunities for public notice and other mechanisms to share information about the projects with the public and to seek feedback on them already exist and are regularly used.”

FACT: This is a false statement. First, public notice should not be done on a voluntary basis. Second the sharing of information by MDE and industry construction companies is wholly inadequate and therefore little feedback is provided by residents who will be impacted by these projects. The reason there has not been massive outcry about “restoration” projects is that the public notification process is broken. See our comments on CWRP’s written testimony on public notice.

EPIC: “5. The bill is based on an incorrect picture of what is ‘natural’ for most of Maryland’s streams and creeks. The closed canopy, bare forest floor stream corridors that I believe proponents of this legislation hope to prevent from being restored aren’t natural in Maryland or the region because America’s pre-colonial population of 400 million beaver would have kept a huge percentage of Maryland’s streams in a natural condition of constant change and opening of canopies. We don’t have room to make space for the way beavers maintain natural stream corridors. Beavers couldn’t fix the deeply incised, eroded stream canyons that 100 years of their absence—and lots of extra runoff from parking lots—has produced.”

FACT: This is a misleading statement and represents a misunderstanding of this bill. First, this bill has nothing to do with beavers. We would like to see peer-reviewed scientific papers that substantiate EPIC’s claims about beavers. Second, the presence or absence of beavers has nothing to do with the cause of erosion in our streams. We do agree that the cause of stream erosion was “lots of extra runoff from parking lots” in addition to other impervious surfaces such as roads and roofs in developed areas as well as runoff from agricultural fields.

EPIC: “But the idea that the temporary loss of small areas of forest trees along restored streams is unusual or unnatural ignores our ecological history.”

FACT: We would like to see peer-reviewed scientific papers that substantiate EPIC’s claim. What is unusual and unnatural are the typical activities that take place during a stream restoration such as chain sawing large mature trees, clearcutting mature stream-side forests, and dumping rocks into streams to make dams that fish and other aquatic animals cannot cross.

EPIC: “My own city of Takoma Park has seen at least two fantastic stream restorations, both of which fixed severe and rapid erosion problems.

FACT: This is a false statement. Any perception that these stream restorations “fixed severe and rapid erosion problems” will be short-lived. The WMCCA’s written testimony (see attachment) and the Expert Panel Report both show photographs of stream restorations destroyed by rainstorms due to the failure to control stormwater from imperious surfaces. For example, the Lower Booze Creek stream restoration in Potomac originally cost \$700,000. After its completion, the Montgomery County Department of Environmental Protection web site states, “Storm damage occurred very soon after construction, initiating structural failures.” The repair work cost an additional \$3.6 million.

EPIC: “A Capital Parks and Planning Project on Sligo Creek removed many trees along deeply eroding banks and built a cascading series of rock ledges for hundreds of feet along the stream to prevent future damage from reemerging, while enhancing the pedestrian trail and replacing a bridge.”

FACT: This is a false and misleading statement. As mentioned above, it has been proven that such work does not “prevent future damage from reemerging” since the root cause of the damage - upland stormwater fire-hosing into streams - has not been controlled.

The fact that part of the entire project resulted in “enhancing the pedestrian trail and replacing a bridge” had nothing to do with a stream restoration. Trail and bridge work is independent of any steam restoration work. Trail and bridge work does not qualify for MS4 permit credit.

EPIC: “A city-funded stream restoration that removed trees in an area named ‘Circle Woods’ similarly fixed an eroding stream in a residential area, earning the city valuable credit to meet its stormwater permit obligations.

FACT: this is a false and misleading statement. First, see the before and after photos below of the Takoma Branch restoration in Circle Woods in Takoma Park.



(From DPW, City of Takoma Park)

It can be seen that the natural character of the forest has been wiped out, including the course woody debris like the fallen tree on the left that woodpeckers and other animals

depend on. Plus, the disturbed soil opens up areas like this to non-native invasive plants. The “before” photo shows that the water is clear enough to see submerged substrate. The water in the “after” photo is brown and opaque, indicating soil erosion that the stream restoration was supposed to stop.

While any stream restoration project will earn the city “valuable credit to meet its stormwater permit obligations,” there are dozens of other non-destructive projects that would have allowed the city to meet its MS4 stormwater permit without destroying natural areas.

EPIC: “Both projects have been huge successes and are now beautiful community amenities, even though the backhoes and bulldozers and equipment were an inconvenience and eyesore for a while.

FACT: The author apparently has a perverse definition of success and beauty which apparently includes a destroyed stream-side forested area, brown running water carrying sediment, and rocks dumped into the stream as seen in the “after” photo above.

EPIC: “As a serving City Councilmember during the time the city’s project was planned and built, I received not a single public comment opposed to the project. Can you imagine that, in Takoma Park?

FACT: Yes, we can image that. Most residents are never aware of these projects. One reason there has not been massive outcry about these “restoration” projects is that the public notification process is broken. This is one area that HB 942 aims to correct.

(i1) Maryland Association of Counties (MACo), by Dominic Butchko

MACo: “This bill would impose stringent barriers on stream restoration projects, effectively hampering one of counties’ most effective tools for stormwater management.”

FACT: This is not a true statement – it is not supported by the documented photographic evidence in the West Montgomery County Citizens Association’s written testimony that stream restorations are being blown-out by rainstorms due to uncontrolled or inadequately controlled out-of-stream runoff. (See the WMCCA comments on MDE’s written testimony).

“There’s also an absurdity at the heart of the argument that rules are inherently destructive. ...to claim that any reforms are ‘a step toward unfreedom is like claiming that road signs, stop lights, and speed limits are steps toward the elimination of driving.’”⁷⁰

MACo: “Stream restoration has been a widely approved practice to meet state and federal requirements under municipal separate storm sewer system (MS4) permits.

FACT: This is a misleading statement. While stream restorations are widely approved, that does not refute the fact that the approval process is flawed due to Expert Panel conflicts of interest and that stream restorations are a failed practice, both physically and biologically. To

⁷⁰ “Big Business’s push to equate the free market with freedom,” by Bethany McLean, Washington Post, Book World section, quoting Naomi Oreskes and Erik Conway from “THE BIG MYTH, How American Business Taught Us to Loathe Government and Love the Free Market”, March 12, 2023.

use an analogy, the promoters of DDT would say that its use was a widely approved practice. (See our comments on MDE’s written testimony).

MACo: “The Chesapeake Bay Program has accepted stream restoration projects as a best management practice (BMP) for years and already has a rigorous and scientifically based approval process for updating its BMP.”

FACT: This is a false statement. CBP’s approval process is not scientifically based and is not created by an independent panel of scientists with no financial conflicts of interest. The current CBP Expert Panels includes employees of the stream restoration industry who, by definition, have a potential conflict of interest. (See our comments on MDE’s written testimony).

MACo echoes the concerns and opposition of the Maryland Municipal Stormwater Association (MAMSA) – whose members represent nearly all counties and are the subject matter experts in stormwater and stream restoration.

FACT: This is a false statement. MAMSA’s membership is primarily people with engineering backgrounds. They clearly are not experts in all the disciplines involved in evaluating the total impact of stream restorations including, but not limited to fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, identification and habitat expertise, total environmental impact analysis, and ecosystem services analysis.

(i1) Maryland Municipal Stormwater Association (MAMSA), by Lisa Ochsenhirt

MAMSA: The Chesapeake Bay Program has a BMP approval process that involves having a panel of experts undertake a rigorous scientific examination of a proposed BMP. There is no basis for revising the requirements for stream restoration given the level of review that has already occurred.

FACT: This is a false statement. CBP’s approval process is not scientifically based and is not created by an independent panel of scientists with no financial conflicts of interest. The CBP Expert Panels include employees of the stream restoration industry. The panel members as a whole do not have expertise in all the disciplines involved in evaluating the total impact of stream restorations including, but not limited to fluvial geomorphology, geology, hydrology, riparian ecology, wetland ecology, stream ecology, population ecology and dynamics, botany, ornithology, herpetology, ichthyology, identification and habitat expertise, total environmental impact analysis, and ecosystem services analysis.

There is a basis for revising the requirements for stream restoration given 1) the documented photographic evidence in the West Montgomery County Citizens Association’s written testimony and the Chesapeake Bay Program’s Expert Panel Report, including Figure 1⁷¹, that

⁷¹ “Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed,” Approved by the Urban Stormwater Work Group of the Chesapeake Bay Program Date: June 18, 2019 (https://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2019/07/Approved-Verification-Memo-061819.pdf)

stream restorations are being blown-out by rainstorms due to uncontrolled or inadequately controlled out-of-stream runoff and 2) the scientific reports that stream restorations do not result in biological uplift^{72 73 74 75}. (See the WMCCA comments on MDE’s written testimony).

(i1) Maryland Department of the Environment (MDE), by Gabrielle Leah

MDE: “Ongoing House Bill 869 Study and MDE Stream Restoration Analysis: Currently MDE’s Wetlands and Waterways Protection Program is undertaking a study on ecological restoration permitting as mandated by HB 869 Permitting for Ecological Restoration Projects - Required Study enacted during the 2022 legislative session, which is due to be completed on or before June 1, 2024. The parameters of the study required by HB 869 overlap with many of the proposed requirements under HB 942. The current participants in the study represent a diverse group of community and environmental organizations, restoration practitioners, academia/research, and other government agencies. The Department is concerned that this legislation predetermines a review and permitting framework for stream restoration projects which will not allow for a thorough and meaningful completion of the HB 869 study and does not consider input from across the regulated community.”

FACT: Unfortunately, the HB 869 study will not result in an independent report. Any results, conclusions, and recommendations from the HB 869 2022 study will be potentially biased by MDE and tightly controlled by MDE. Study participants were told during the 12/13/2022 meeting that participants will not be able to vote on any aspects of the final report and that the final report will be authored solely by MDE (per Ken Bawer, a participant in the study representing West Montgomery County Citizens Association). While MDE says that it may consider input from across the regulated community, MDE has stated that they are not bound to accept any recommendations of the study group members. Thus, MDE is free to “listen and ignore.” Another problem is that MDE was apparently satisfied with current stream restoration construction techniques and MS4 permit crediting schemes prior to this study, so this study is being controlled by a group with a predisposition to maintain the status quo. The study is arguably flawed from its inception due to this potential conflict of interest. The only way to ensure that the results of the study are based solely on science would be to have a truly independent panel of scientist in fields such as fluvial geomorphology, ecology, botany,

⁷² Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

⁷³ 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)

⁷⁴ 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)

⁷⁵ 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/>)

etc. conduct a study based on the science, not based on considerations of the for-profit stream restoration industry or entrenched MDE thinking.

MDE: “In addition, MDE is charged with protecting Maryland’s waterways from loss and degradation as well as meeting Chesapeake Bay restoration and TMDL goals. As part of these responsibilities, MDE has undertaken many initiatives related to stream restoration to analyze Maryland’s progress towards these goals and ensure our resources (including riparian forests) are protected.”

FACT: Empirical observation clearly shows that MDE is clearly not protecting riparian forests. See WMCCA’s written testimony which includes a [video link](#) and numerous photos showing the damage done to riparian forests in natural areas by stream “restorations” around the state.

MDE: “Mitigation Banking: HB 942 would have serious negative consequences for mitigation banking in Maryland. As written, HB 942 significantly discourages mitigation banking and may incentivize permittee-responsible mitigation, including largely unsuccessful “postage stamp” sized mitigation projects.”

FACT: There is no evidence provided to support the assertion that “HB 942 HB 942 significantly discourages mitigation banking and may incentivize permittee-responsible mitigation.”

FACT: There is no evidence provided to support the assertion of “largely unsuccessful “postage stamp” sized mitigation projects.” The Mitigation Rule⁷⁶ states, “The studies that we have reviewed have shown that mitigation banks have experienced many of the same problems as permittee-responsible mitigation.” The fact is that stream restorations done for any purpose, including mitigation banking, are unsuccessful because they destroy large areas of riparian forests, destroy wildlife habitat, and rarely, if ever, result in biological uplift of in-stream biology^{77 78 79 80}.

MDE: “The 2008 Federal Mitigation Rule sets a preference for mitigation banks and the current mitigation program....”

⁷⁶ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

⁷⁷ Hilderbrand, Robert H., et. al., “Quantifying the ecological uplift and effectiveness of differing stream “restoration” approaches in Maryland,” Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

⁷⁸Jepsen, 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)

⁷⁹ 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)

⁸⁰ 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/>)

FACT: This is not true. The Federal Mitigation Rule⁸¹ states, “There are three mechanisms for providing compensatory mitigation: permittee-responsible compensatory mitigation, mitigation banks and in-lieu fee mitigation. Permittee-responsible mitigation is the most traditional form of compensation and continues to represent the majority of compensation acreage provided each year.” Furthermore, the Fed Mitigation Rules states that “economic factors should not supersede ecological considerations.”

MDE: “TMDL/MS4 Crediting: TMDL credits are determined by protocols approved by the Chesapeake Bay Program (CBP) in order to align MDE’s crediting process with the Chesapeake Bay Phase 6 Model. It would not be possible for MDE alone to alter them. Any changes to the ISR accounting and MS4 Equivalent Impervious Acre (EIA) calculations will require an update to the 2021 Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for National Pollutant Discharge Elimination System Stormwater Permits (“2021 Accounting Document”).”

FACT: MDE misreads what is in HB 942. This bill does not request, nor require, any changes to TMDL credits nor any changes to the ISR accounting and MS4 Equivalent Impervious Acre (EIA) calculations.

It is false to say that, “It would not be possible for MDE alone to alter [TMDL credits]. Per MDE, the CBP Expert Panel reports are only recommendations that MDE is not bound to follow. In fact, MDE has modified these recommendations in the past based on their scientific analyses.”⁸²

However, MDE does control which practices are allowed within its Accounting Guidance⁸³ document. For example, while HB 942 does not suggest this, MDE could completely disallow the practice of stream restorations to be used for MS4 permit crediting.

MDE: “Alteration of the accounting and credit calculations would require a major permit modification for all 10 issued MS4 Phase I permits, which must be approved by the U.S. Environmental Protection Agency and go through the state required public notice process.”

FACT: This bill does not request, nor require, any changes to TMDL credits nor any changes to the ISR accounting and MS4 Equivalent Impervious Acre (EIA) calculations. However, if MDE deems it prudent to do so, there is no need for permit modifications for the 10 issued MS4 Phase I permits. The new accounting and credit calculations, once approved by EPA and going

⁸¹ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”)

(https://www.epa.gov/sites/default/files/2015-03/documents/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf)

⁸² Per Lee Currey, Director, MDE Water and Science Administration, 3/22/2023 meeting with Sierra Club, Blue Water Baltimore, Chesapeake Legal Alliance, The Nature Conservancy, and others.

⁸³ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits

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

through the public notice process, could apply to the new permits after the current permits expire.

MDE: “Biological Uplift Goal: While stream restoration projects are designed to address acute bank stability and instream habitat impacts, impacts to biology cannot be remediated through stream restoration alone as upland pollution also contributes to biological impacts.”

FACT: This is misleading and inaccurate. First, MDE says that stream restorations done for MS4 permits do not require that biological uplift be achieved. But this conflicts with the Expert Panel report which states that “Stream restoration is a carefully designed intervention to improve the hydrologic, hydraulic, geomorphic, water quality, and biological condition of degraded urban streams, and must not be implemented for the sole purpose of nutrient or sediment reduction.”⁸⁴ Therefore, according to the Expert Panel report, a stream restoration cannot proceed if biological uplift is not possible.

However, stream restorations built as mitigation projects are required to remediate impacts to biology and demonstrate biological uplift. Another misleading implication of MDE’s statement is that stream restorations are an important and essential component of remediating impacts to biology along with upland pollution (read: stormwater) control. This is the “we must use all the tools in our toolbox” argument that is not supported by scientific evidence. The science says that that stream restorations do not result in biological uplift (see the 4 references above from Hilderbrand et. al., Jepsen et. al., Palmer et. al., and Pedersen, et. al.).

Having said that, the missing scientific link is that no one has studied the results of the impact of relatively complete upland stormwater control, in the absence of a stream restoration, on in-stream biological uplift. However, one part of the equation has been examined: what happens to the eroded banks of a stream when relatively complete upland stormwater control is done in the absence of a stream restoration? Upland, out-of-stream stormwater control would remove the primary cause of active stream bank erosion and thus eliminate the need for stream restorations. There is scientific evidence by Fraley McNeal, et. al.⁸⁵ that after controlling stormwater upland, stream banks will self-recover. But the industry doesn’t like passive, self-recovery solutions because there is no money to be made.

MDE: “Biological uplift is the goal of a holistic watershed management approach which utilizes a suite of best management practices (BMPs) (including stream restoration where necessary and approved) to address a multitude of pollutants that impact biology.”

FACT: This is misleading. Although MDE states that biological uplift is someone’s goal, biological uplift is apparently not one of MDE’s goals. MDE curiously does not require

⁸⁴ 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,” page 17; <https://chesapeakestormwater.net/wp-content/uploads/2022/07/9928-1.pdf>

⁸⁵ “The Self-Recovery of Stream Channel Stability in Urban Watersheds due to BMP Implementation,” by Lisa Fraley McNeal, Bill Stack, et. al., March 2021, Prepared by the Center for Watershed Protection, Inc. https://cbtrust.org/wp-content/uploads/Self_Recovery_of_Stream_Channel_Stability_Final_Draft_03-23-21.pdf

biological uplift to be demonstrated for MS4 permit credit. That is why HB 942 makes this a requirement for all stream restoration projects. And as stated above, another misleading implication of MDE's statement is that stream restorations are an important and essential practice to achieve biological uplift along with upland pollution (read: stormwater) control. This is the "we must use all the tools in our toolbox" argument that is not supported by scientific evidence.

MDE: "Monitoring: Under the proposed legislation, stream restoration projects must be monitored for a period of 10 years (prior to release of any credits) to verify achievement of stated goals."

FACT: Delegate Terrasa stated that she would offer an amendment which would defer to MDE in setting a credit release schedule.

MDE: "It will require a considerable undertaking for MDE to develop monitoring plan requirements to assess biological uplift goals (which may not be attainable) for individual projects independent of the monitoring and verification procedures that already exist."

FACT: MDE misunderstands the bill's requirements. Bill HB 942 does not require monitoring which is independent of the monitoring and verification procedures that already exist. Rather, this bill simply requires that more projects be subjected to the currently existing type of monitoring and verification procedures. This bill does not require MDE to recreate the wheel. MDE's current monitoring plan requirements are wholly inadequate and are not even a firm requirement. Currently, no matter how many stream restorations a jurisdiction does for MS4 permit credits, only one stream restoration project is required to be monitored. Adding insult to injury, the monitoring results from that one project can be totally useless **due to inadequate MDE regulations. For example, the one stream restoration project out of many that Montgomery County chose to monitor is called the Breewood project. Unfortunately, it is impossible to attribute the results of the Breewood stream restoration monitoring to the stream restoration project itself. This is because the instream monitoring station is downstream from not just the stream restoration but also other stormwater control practices including Green Streets projects such as bioretentions and pervious pavement.**

But even doing one stream restoration monitoring for an MS4 permit is not a firm requirement. MDE actually allows jurisdictions to completely opt out of that requirement by instead paying into a pool of money which is used to fund research.

MDE: "As stated above MDE believes that biological uplift is not a realistic goal for every stream restoration project."

FACT: If MDE does not believe that biological uplift can be achieved by a specific project, MDE should not grant a permit for that project in the first place. In fact, stream restorations done for mitigation projects are required to demonstrate biological uplift as required by the Federal Mitigation Rule.⁸⁶ Therefore, MDE should also require biological uplift for stream restorations done for the MS4 permit. A stream restoration is a stream restoration.

⁸⁶ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation

The ultimate purpose of stream restoration projects done for MS4 permits is to promote biological uplift in the Bay (i.e., to increase aquatic vegetation and fish, crab, and oyster stocks). Incomprehensibly, MDE's MS4 permits do not also require local biological uplift to be demonstrated at the actual project site which can be very far from the Bay. Aside from checking the MS4 permit box, there is no point to the destruction caused by a "restoration" project which only enhances a stream's physical attributes (i.e., decreases erosion) if the end result does not also provide biological uplift at the project site. We should not have to sacrifice our local natural areas, even if they are not in pre-colonial condition, on the altar of saving the Bay. As Hilary Harp Falk, president and CEO of the Chesapeake Bay Foundation said, "A lot of times we evoke the Bay of 400 years ago, before colonialism. So much has changed during that time. The Bay watershed is now home to almost 19 million people. We're in the age of climate change. That means we are not going back to that Bay."⁸⁷ That also means we are not going back to streams of 400 years ago.

MDE: "Best Available Science: The 2021 Accounting Document directs jurisdictions to use protocols from the 2014 Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects ("Expert Panel") to calculate Stream Restoration credit, which incorporates the most recent science on crediting and verification methods and is written by a panel of local scientists, practitioners, and watershed managers."

FACT: This is a demonstrably false statement about the Expert Panel report⁸⁸. First, these reports are not based on science, they are based on engineering principles. In fact, the crediting methods are based on irreproducible techniques. The crediting scheme is based on gross estimates of how effective stream restorations are in reducing erosion, and the report recommends using calculations which are estimates on top of estimates. This including using the highly unreliable BANCs method to estimate stream bank erosion which is not reproducible. The Expert Panel report says of the BANCs method 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 useless.

On top of that, the Expert Panel is so unsure of the results of their estimation calculations that they take what falls out of the bottom and cut it by 50%. So much for having confidence in their work. There is no peer reviewed scientific literature to support using the Expert Panel recommendations.

To make matters worse, the Expert Panel included stream restoration industry employees who may have had a vested interest in ensuring that the crediting calculations maximized

for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the "Mitigation Rules or Federal Mitigation Rules")

⁸⁷ "Chesapeake Bay Foundation leader calls for shifts in Bay cleanup," by Timothy B. Wheeler, Chesapeake Bay Journal, March 6, 2023, https://www.bayjournal.com/news/people/chesapeake-bay-foundation-leader-calls-for-shifts-in-bay-cleanup/article_2be65c64-b5f1-11ed-b3db-87b767f0a295.html

⁸⁸ 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>

their profits. This may have been a blatant 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.

MDE: “As MDE defers to the Expert Panel report, credit for MS4 EIA and TMDL progress as well as the reductions reported to the CBP for Bay TMDL progress already consider the best available science with regards to stream morphology, geology, biology, hydrology, ecology, watershed management, and wildlife corridors.”

FACT: This is a misleading statement. Although MDE and the Expert Panel reports may consider the best science, they certainly do not follow the science. As stated above, the science shows that stream restorations don’t result in biological uplift.

MDE: “Upland Alternatives: MDE is required under HB 942 to incentivize upland alternatives (deemed to be “less destructive to the environment”) to stream restoration through the crediting mechanisms for TMDL, MS4 targets, mitigation goals, or other restoration goals. Credits for non-stream restoration practices are consistent with efficiencies from the CBP and match the credit provided in the Chesapeake Bay Phase 6 Model.

In order to provide additional incentives, MDE will have to develop additional unapproved BMPs, or be provided with (or conduct) studies demonstrating nutrient and sediment reductions that are greater than those already established by the current literature.”

FACT: These are false statements. This bill does not prescribe how MDE incentivizes upland alternatives. MDE will not, in fact, have to develop any additional BMPs. There are already dozens of upland BMPs in MDE’s Accounting Guidance⁸⁹ document that can be used for upland stormwater control such as green roofs and rain gardens. The more upland BMPs that are installed by a jurisdiction, the more credits will be garnered.

The provision of addition incentives for upland stormwater control may require some out of the box thinking. For example, DEP could increase credit for the rainfall depth treated for structural practices to greater than the current **three inch maximum⁹⁰. Or, MDE could put an MS4 permit cap on the percentage of credits that can be achieved via stream restoration and a minimum for upland stormwater control credits. MDE could recommend laws requiring existing buildings to meet new-build stormwater control requirements upon property transfer (buying/selling). MDE could incentive upland stormwater control by combining certain MS4 Permits, such as Montgomery County and Montgomery Parks. Currently, Montgomery Parks points out that they have no ability to do upland stormwater control at its source when the stormwater comes from outside their parks in the county itself.**

⁸⁹ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

⁹⁰ Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, November 2021,” p.28, 29
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determinatio%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf>

This bill does not require, nor suggest, that credits for efficiencies be changed, but it should be noted that the current credits for stream restoration are bogus numbers developed with the help of industry employees with a potential conflict of interest as described above.

MDE: “In addition, compensatory mitigation to offset impacts to stream impacts cannot be offset through upland projects under federal requirements.”

FACT: This is a false statement. The Federal Mitigation Rule⁹¹ does allow stream impacts to be offset through upland projects. It states that the district engineer may determine “that out-of-kind compensatory mitigation will better serve the aquatic resource needs of the watershed.”

⁹¹ Federal Register, Thursday, April 10, 2008, Part II, Department of Defense, Department of the Army, Corps of Engineers: 33 CFR Parts 325 and 332; Environmental Protection Agency: 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (aka Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008 / Rules and Regulations) (referred to as the “Mitigation Rules or Federal Mitigation Rules”) (https://www.epa.gov/sites/default/files/2015-03/documents/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf)

(i2) Attachment: Written Testimony for West Montgomery County Citizens Association (WMCCA), by Kenneth Bawer

WEST MONTGOMERY COUNTY CITIZENS ASSOCIATION

P.O. Box 59335 • Potomac, Maryland 20854

Founded 1947

Committee: House Environment and Transportation Committee

Testimony on: Bill Number HB 942 “Wetlands and Waterways Program - Authorizations for Stream Restoration Projects”

Position: Favorable

Hearing Date: March 3, 2023

The West Montgomery County Citizens Association (WMCCA) supports HB 942 “Wetlands and Waterways Program - Authorizations for Stream Restoration Projects.”

WMCCA welcomes the opportunity to provide written testimony on this bill. It will strengthen Maryland’s commitment to cleaning up the Chesapeake Bay while at the same time recognizing the need to safeguard local natural resources. The focus of this testimony is to make Delegates aware of the damage done by stream “restorations.” Bill HB 942 promotes more effective and beneficial stream restoration projects and incentivizes alternatives to stream restorations using less destructive out-of-stream stormwater control methods such as rain gardens, bioswales, green roofs, permeable paving, and conservation landscaping to replace turf grass.

This testimony includes a video link and numerous photographs of the unconscionable damage done to our natural areas by numerous stream restoration projects. Please take a few minutes to watch this video of the [Solitaire Court stream restoration](#) in Gaithersburg that was completed in May of 2022. Without exception, everyone who sees this video is appalled by the destruction of what once was a lovely stretch of wooded stream. What you see are typical activities that take place during a stream restoration such as chain sawing large mature trees, clearcutting mature stream-side forests, and dumping rocks into streams to make dams that fish and other aquatic animals cannot cross. The narrator describes the results that we can see with our own eyes: a landscape that is “...clearcut, demolished, torn out, stripped to bare dirt, leaving no trace of life. A desert landscape. ...The canopy gone, leaving the entire corridor open to hot, baking sun and drying winds.” One viewer said, “I do not understand how this is legal.” Another person asked, “Why do they call it restoration?”

Stream “Restorations” Don’t Restore Streams

Stream restorations typically clear-cut mature stream-side forests. Young trees are replanted, but these will take decades or longer to approximate what was destroyed. The complex web of interactions

between fauna, flora, geology, and hydrology in natural areas can't be recreated by engineering projects using bulldozers, trucked-in rock rubble, and some replanted saplings.

The following photographs show examples of stream restorations that have been done in several jurisdictions around the state and illustrate the need for stream restoration reform. The photo below is a stream restoration at Nature Forward (formerly Audubon Naturalist Society) in Chevy Chase.

This was once a fully wooded area. It shows the heavy construction equipment being used. Visible are the plastic sheets used and large boulders dumped in the stream channel.



(Above: Nature Forward, Chevy Chase; <https://conservationblog.anshome.org/tag/stream-restoration/>)

The next photo at this same site shows a series of rock dams built with rock rubble that has been dumped into the stream channel. Now there is no way for aquatic creatures to move up and down this stream.



(Above: Nature Forward, Chevy Chase; <https://conservationblog.anshome.org/tag/stream-restoration/>)

The aerial photo of a stream restoration at the Asbury Methodist Village in Gaithersburg shows how rock rip rap has been dumped at intervals into the stream to create a series of dams. These dams prevent the migration of fish and other aquatic organisms. You can get an idea of scale compared to the large trees at the bottom.



(Above: Asbury Methodist Village, Gaithersburg, <https://www.youtube.com/watch?v=hGZN-L0Qrj0>)

The next photo is an example of the utter destruction caused by a stream restoration in the City of Rockville in the upper Watts Branch. This project was completed in 2018. The riparian, or stream-side, forest buffer has been completely destroyed and scraped down to bare soil. Before it was clearcut, the trees along this stream provided shade which lowered the water temperature required by some sensitive aquatic organisms.



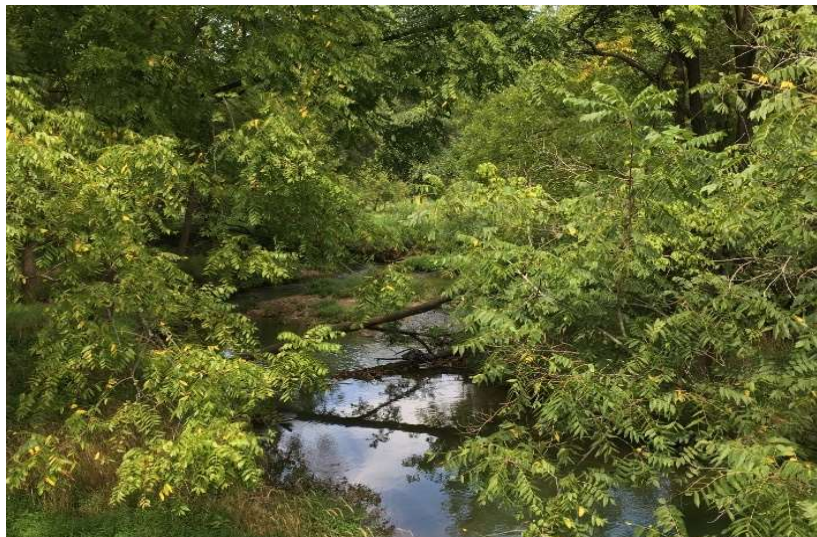
(Above: Stream "restoration" in Upper Watts Branch, Rockville; photo by City of Rockville)

What happens to the stream during these construction projects? Below is the Falls Reach project in Potomac, MD. The entire stream was forced to run through this black pipe during construction. How hot do you think that water gets? No longer can frogs, turtles, and other animals access the water. And it gets worse. According to a U.S. Department of Agriculture National Engineering Handbook called “Stream Restoration Design”, “Aquatic life would be either be prevented from passing the project or pulverized by the pumps.”⁹² So not just fish but frogs, crayfish, northern water snakes, baby snapping turtles, spotted turtles, etc. are at risk.



(Above: Falls Reach Stream Restoration Project; photo by K. Bawer, 3/19/2019)

The pre-construction photo of Whetstone Run in Blohm Park, Gaithersburg shows a riparian, or stream-side, forest that was quite dense and lush.



(Above: before construction, Whetstone Run in Blohm Park, Gaithersburg; by K. Bawer, 5/03/2021)

⁹² “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

The post-construction photo below, taken at the exact same location, shows the total destruction of the stream-side forest. The original stream channel was filled and a whole new stream channel was dug. The original, natural stream never had this kind of artificial meander pattern, or sinuosity, that was created by the heavy machinery. Some of the paltry replanting is barely evident.



(Above: after construction: Whetstone Run in Blohm Park, Gaithersburg; by K. Bawer on 5/03/2021)

This is another view of the Whetstone Run project just to show that there were, in fact, lots of mature trees cut down.



(Above: Whetstone Run , Gaithersburg from <https://www.youtube.com/watch?v=1XLXRNmN9L8&t=61s>)

To show how the original, pre-construction stream was moved, a trace of the original stream channel location in green is overlaid with a trace of the new stream channel in red. The image is quite shocking.



(Above: photo for “before” green trace from <https://earthexplorer.usgs.gov/>, photo for “after” red trace from Google Maps)

The next several photographs show different views of a destructive stream restoration in Columbia.



(Above: Columbia stream restoration in Longfellow neighborhood; by S. Boies, 1/8/2021)



(Above: Columbia stream restoration in Longfellow neighborhood; by S. Boies, 4/6/2021)



(Above: Columbia stream restoration; by S. Boies)

Next is the Solitaire Court stream restoration in Gaithersburg (the location of the video link on page 1). Before construction, none of the houses below were visible through the narrow strip of forest. At the pre-construction walk-through, the city program manager was asked what will happen to little animals like frogs, turtles and salamanders. That person responded with a straight face, “Oh, they’ll just move away and come back after the construction.”



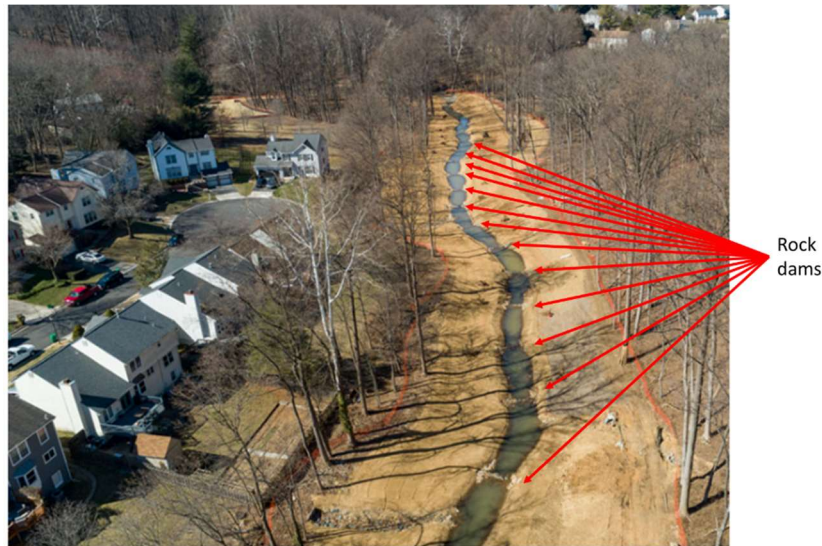
(Above: Solitaire Court stream restoration in Gaithersburg; photo by K. Bawer, 10/23/2021)

In another photograph, the former forest can be seen reduced to a giant pile of logs.



(Above: Solitaire Court stream restoration in Gaithersburg; photo by R. Portonova, 12/3/2021)

In another view of the Solitaire Court project, the arrows point to some of the rock dams created by dumping rocks into the stream. These will totally block fish and other aquatic organisms. Plus, the stream will drastically heat up now that a large number of the shade trees were cut. Note that the critical root zones of the trees (the area around the base of a tree containing most of a tree's roots that are critical for its survival) near the orange construction fences (on both sides of the clear-cut area) were not protected, so many of these edge trees will die due to soil compaction.



(Above: Solitaire Court project in Gaithersburg; <https://www.gaithersburgmd.gov/government/projects-in-the-city/solitaire-court-stream-restoration-project>)

Below is another view of the Solitaire Court project from further downstream. Again, this was a fully wooded forest. All of the trees on the left with the vertical wood scape protectors (the red arrow points to one) will probably die because their critical root zones have been severely compacted. And the line of big trees on the right at the edge of the clear cut will also likely die due to soil compaction.



(Above: Solitaire Court stream restoration in Gaithersburg; photo by R. Portanova, 2/7/2022)

The following photos are “before” and “after” pictures of the Takoma Branch project in Takoma Park.



(Above: before construction, Takoma Branch, Takoma Park; photo by DPW, City of Takoma Park)

After construction, it can be seen that the natural character of the forest was wiped out including removal of woody debris such as the fallen trees that woodpeckers and other animals depend on.



(Above: after construction, Takoma Branch, Takoma Park; photo by DPW, City of Takoma Park)

Below is the Briers Mill Run in Prince Georges County after restoration. Before this project, the area was a natural strip park with lots of trees and understory plants – a great place for kids to explore and animals to live. Not so much anymore. This is now merely an engineered drainage ditch.



(Above: Briers Mill Run, Prince Georges County;
<https://www.facebook.com/PGCCWP/posts/1299726287063844>)

Next is the Scotts Level Branch stream restoration in Baltimore County. The county web site says that they are concerned about providing essential habitat and vegetative buffers for streams. Why then are they destroying what they already have?



Scotts Level Branch Stream Restoration Project

(Scotts Level Branch stream restoration, Baltimore County; from
<https://www.youtube.com/watch?v=ix42pr9t3ts>)

The following photo shows the pre-restoration St. Charles Parkway stream in Charles County. This was a fine-looking stream valley until the riparian forest was clearcut.



(Above, St. Charles Parkway stream restoration, Charles County; from <https://www.charlescountymd.gov/our-county/infrastructure-capital-services/npdes-project/st-charles-parkway#ad-image-0>)

What remained was a pile of logs, some of which are shown in the photo below.



(Above, St. Charles Parkway stream restoration, Charles County, from <https://www.charlescountymd.gov/our-county/infrastructure-capital-services/npdes-project/st-charles-parkway#ad-image-0>)

Two other views of the St. Charles Parkway stream restoration are shown below.



(Above, St. Charles Parkway stream restoration, Charles County; from <https://www.charlescountymd.gov/our-county/infrastructure-capital-services/npdes-project/st-charles-parkway#ad-image-0>)



(Above, St. Charles Parkway stream restoration, Charles County; from <https://www.charlescountymd.gov/our-county/infrastructure-capital-services/npdes-project/st-charles-parkway#ad-image-0>)

The Mayberry Stream Restoration in Carroll County was completed in spring of 2022. Heavy construction equipment destroyed a wide swath right through the forest. Note how the trees on the edges have no protection. This photo shows a bulldozer running over trees' critical root zones and compacting the soil. Many trees along both sides of the project will probably die due to soil compaction.



(Above: *Mayberry Stream Restoration in Carroll County*; from <https://www.carrollcountymd.gov/media/16472/mayberry-stream-restoration.pdf>)

The next photo is the post-construction Bacon Ridge stream restoration in Anne Arundel County. They cut down about 400 trees for this project!



(Above: *Bacon Ridge stream restoration, Anne Arundel County*; by K. Bawer, 7/14/2021)

The next picture is a failed Cabin Branch stream restoration in Montgomery County showing how uncontrolled stormwater has eroded out the stream bank behind the rock armor-plating rendering it useless. This is an example of why stream restorations are only a temporary fix to stream bank erosion.



(Above: Cabin Branch Stream in Cabin John Regional Park, Montgomery County; by K. Bawer, 3/19/2021)

The photo below shows blown-out armor plating along Long Branch in Takoma Park. Notice the huge size of these boulders compared to the people.



(Above: Long Branch, Takoma Park; photo by K. Bawer, 10/2/2021)

The next photo is Snakeden Branch in Potomac. The blown-out area can be seen on the right bank. The water has gone over and behind the rock wall and has continued to erode the stream bank behind it. Also visible is exposed plastic geotextile fabric which will break down and add to the micro plastics problem.



(Above: Snakeden Branch, Potomac; by K. Bawer, 11/23/2021)

Below is a photo of an unnamed tributary to Great Seneca Creek in Gaithersburg. Note the disrupted rock structure exposing plastic fabric. Stormwater has continued to erode the stream bank behind the rocks despite the stabilization attempt.



(Above: unnamed tributary to Great Seneca Creek, Gaithersburg; by K. Bawer, Fall, 2022)

The Lower Booze Creek stream restoration in Potomac originally cost \$700,000. After its completion, the Montgomery County Department of Environmental Protection web site states, “Storm damage occurred very soon after construction, initiating structural failures.” This photo shows some of the damage to the original stream restoration project at one location.



Lower Booze Creek - Erosion downstream of imbricated wall structure from original stream restoration.

(Above: Lower Booze Creek, Potomac; photo from <https://www.montgomerycountymd.gov/water/Resources/Files/restoration/streams/Lower-Booze-Creek-Restoration-Repair-Fact-Sheet.pdf>)

The repair work cost an additional \$3.6 million. Since stream restoration companies typically only guarantee their work for one year, when they are destroyed after that it is the taxpayers who pick up the bill. The photo below was after the repair work at one location which was formerly fully wooded.



(Above: repair of the restoration in Lower Booze Creek, Potomac; photo by K. Bawer, 12/4/2021)

On top of all that, the scientific literature^{93 94 95 96} says that these projects rarely, if ever, result in improved in-stream biology.

In summary, the current problems with stream restorations are clearly visible if only we will acknowledge what can be seen with our own eyes. These photographs provide irrefutable evidence that stream restorations don't actually restore streams, that projects get blown-out because upland stormwater has not been adequately controlled, and that stream restorations are, in fact, devastating to both the stream itself and the local environment where they are constructed. Bill HB 942 would incentivize less destructive out-of-stream alternative stormwater control methods while promoting more effective and beneficial stream restoration projects. This bill will help us achieve another Rachael Carson moment for environmental protection in Maryland.

We urge the Committee's FAVORABLE report on HB 942.

Kenneth Bawer
Board Member, West Montgomery County Citizens Association
kbawer@msn.com

⁹³ Hilderbrand, Robert H., et. al., "Quantifying the ecological uplift and effectiveness of differing stream "restoration" approaches in Maryland," Final Report Submitted to the Chesapeake Bay Trust for Grant #13141, 2020 (https://cbtrust.org/wp-content/uploads/Hilderbrand-et-al_Quantifying-the-Ecological-Uplift.pdf)

⁹⁴ 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)

⁹⁵ 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)

⁹⁶ 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/>)