Crooked, Stony and Pughs Run Community Engagement Meeting #2

Edinburg Public Library: December 16, 2024

Participants

Rob Arner (Landowner)
Justin Bridges (Georges)
Dana Gochenour (LFSWCD)
Michelle Robinson (FNFSR/landowner)
Keith Knupp (landowner)
Tyler Hinkle (Shenandoah County)
Nesha McRae (DEQ)
Mark Frondorf (Shenandoah Riverkeeper)
Karen Andersen (FOSR)
Laura Bennett (FNFSR)
Jeff Dalke (landowner)
Phil Daley (landowner)
Tara Wyrick (DEQ)

Summary

Nesha McRae (DEQ) welcomed participants and apologized for the delay since the last meeting. She explained a series of obstacles DEQ encountered when trying to create a model of the Stony Creek watershed and set sediment reduction targets for the stream. Verifying results took considerably more time than originally anticipated. The group began by reviewing updated land cover estimates for the watersheds. Nesha explained that the values for each of the watersheds had been updated following input on land use management at the last meeting, in addition to updates made to Stony Creek to ensure that estimates of streambank erosion contributions were correct. The group also discussed the types of permitted sources present in each watershed. A participant asked if Nesha made any comparisons between stream flow rates in the watersheds and streambank erosion, or other factors that might result in elevated erosion rates in Stony Creek. Nesha explained that DEQ does not have flow measurements for the watersheds, but she did compare channel depths and slopes in the watersheds. She also looked at erosion rates in other large streams. Nesha concluded that the Stony Creek watershed has steeper slopes and deeper channels than the other watersheds, making it more susceptible to erosion. In addition, it is a borderline impairment with a largely forested watershed, which may make bank erosion look like a comparatively large source in the watershed. A participant asked how sediment from pasture runoff is differentiated from sediment coming from streambank erosion. Nesha shared photos of streambank erosion, noting areas of exposed banks within the channel that are actively eroding. She explained that contributions are estimated, but not measured. Runoff from pasture is sediment transported across the land and then deposited into the stream channel. Another participant asked about other factors that could be accelerating streambank erosion in Stony Creek including climate change. It is possible that periods of drought followed by high flows during large storms could be making bank erosion worse. Climate change is a challenge to address in TMDL development since it represents a long-term change in weather patterns. Scientists are working on ways to incorporate it into TMDL models, but it's going to take some time. Nesha added that if we move through the TMDL process and learn that bank erosion in Stony Creek is being overestimated, those values can be adjusted.

The group moved on to discuss section 2 of the handout, reviewing the methodology used to set sediment reductions. Nesha explained the process used to develop AllForX Multipliers for each of the impaired watersheds by looking at the estimated existing sediment load compared to what the load would be if the watershed were all forested. These multipliers were then compared to those developed for a series of other healthy watersheds to create a regression between AllForX multipliers and VA Stream Condition Index scores (a measure of biological health). This regression was used to identify the AllForX multiplier that resulted in a predicted Stream Condition Index Score of 60. This multiplier value was then used to identify the reductions needed from each impaired watershed (e.g. if Crooked Run had an AllForX multiplier value of 12 and the target AllForX value was 5, then a 50% reduction in sediment would be needed in the watershed). Nesha noted where Stony Creek fell on the regression line, hovering right around a Stream Condition Index score of 60. Stony Creek is a borderline impairment, largely due to the extent of forest in the upper portion of the watershed, which is not impaired. Nesha noted that new structures data for 2013-2023 provided by Shenandoah County shows 259 new structures were constructed in Stony Creek in that 10-year period. Of these structures, 215 were single residences and 43 were commercial structures. Comparatively, Crooked Run had two new residences constructed in this time, and Pughs Run had 55 (54 residential). This suggests that Stony Creek is experiencing some growth and will continue to do so. With more development comes more impervious surface and more streambank erosion. This validates the approach currently being taken with the Stony Creek TMDL. This approach is conservative, with a set aside of sediment for future growth in the region in addition to a margin of safety to ensure that the targets are protective enough of local water quality. Nesha noted that much of the development occurring in Stony Creek falls below the threshold requiring stormwater management permits, making it difficult to track. A participant asked whether the model used for TMDL development considers soil compaction and soil types when simulating runoff across the land. Nesha responded that is considers soil types, hydrologic soil groups, slopes and other characteristics that impact infiltration rates. A participants asked if flow from Lake Laura and snow melt from the resort might be affecting stream health in Stony Creek. Nesha was unable to retrieve previous statistical analyses of spring and fall scores in Stony Creek due to connectivity issues but reviewed biological monitoring data showing lower spring scores compared to fall. A chart showing this comparison is provided below. Statistical analyses showed that average spring scores in Stony Creek are significantly lower than fall scores in the watershed. Participants thought that this difference in stream health could be due to impacts from snowmelt and elevated sediment runoff. Participants asked about years of drought and periods without much snowmelt, trying to pull out differences in seasonal trends in stream health. DEQ does not conduct biological monitoring at every site every year, so some periods of drought or high flows were not reflected in the data set that Nesha had to share (e.g. 2018). A participant noted that periods of extended drought could mean that sediment deposited in the stream bed during high flow events would take much longer to move downstream, leading to prolonged periods of excess sedimentation and poor stream health. A participant asked whether DEQ took measurements of dissolved oxygen when sampling benthic macroinvertebrates. Nesha responded that they did and that issues with dissolved oxygen or nutrients were not observed in the streams.

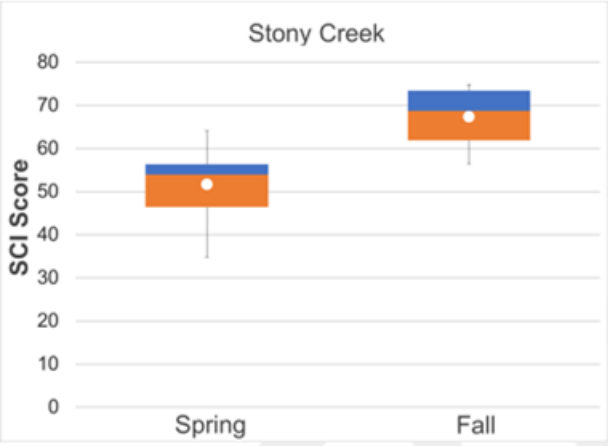

Figure 1. Stony Creek stream condition index scores (spring and fall). Whiskers indicate the range, boxes indicate the inter-quartile range, lines indicate the median, and white markers indicate the average.

A participant asked how estimates of streambank erosion could be better refined, and whether there are portions of the watershed that are largely responsible for the problem. Nesha explained that part of the implementation planning process can include stream walks and identification of problem areas that can be targeted with best management practices. This level of detail is not included in the TMDL study where the objective is to identify sources of impairment at the watershed scale along with the reductions needed to restore the stream. A participant asked how streambank erosion can be addressed on the ground. Nesha explained that this process can be expensive since it often requires assistance from an engineer. The streambanks need to be laid back in places where downcutting has occurred to allow the stream to access its floodplain and dissipate energy to reduce downstream erosion. Keeping the banks vegetated also helps to prevent scour, though often vegetation alone is not sufficient. A participant noted that the practice of beginning streambank restoration in the headwaters of a stream might not be appropriate in Stony Creek. The downstream portions of the creek where there has been more development are experiencing the greatest extent of erosion, while forested upstream areas are not actively eroding. The areas below Swover Creek and within the Town of Edinburg should be targeted for streambank restoration.

Participants discussed the challenges in pinpointing connections between precipitation levels and streambank erosion, noting that the streambanks in the headwaters of Stony Creek are not eroding despite similar weather conditions. The group discussed how streambank erosion issues can be transferred downstream as a stream becomes channelized and water moves faster through the channel scouring away at the banks. The group also discussed potential impacts from removal of the Woodstock dam on Little Stony Creek. It's unknown just how much sediment has accumulated behind the dam and how long it will take to move through the system once the dam is removed. Participants explained that there is still a lot left to work out in terms of a timeline for the project, funding and technical aspects. It's probably 3-5 years out given what still needs to be worked out. Participants agreed that streambank restoration should not be targeted in portions of the creek in close proximity to the dam at the beginning of the implementation process.

Review of sediment reduction scenarios

The group reviewed four reduction scenarios for each impaired watershed. The first scenario focused the greatest reductions on the largest sources of sediment. The second scenario prescribed equal reductions for all sources. The third and fourth scenarios focused solely on reductions to agricultural and urban sources, respectively. Participants felts that the last two scenarios would not be fair or equitable since they singled out particular landowners. Nesha explained that these scenarios are shown to illustrate the role that each land use plays in the impairment, and that DEQ would not advise taking this approach. Participants were concerned that Scenario 1 in Crooked Run included too large of a reduction on cropland. The group felt that as a whole, most farmers are doing the right things to prevent erosion on their cropland, and that it would be hard to achieve a 60% reduction for this land use. Participants asked about participation levels in existing agricultural BMP cost share programs in the watersheds. Nesha reviewed data from the VA agricultural cost share program for the past 15 years with the group. Participation in Crooked Run has been much lower than in Pughs Run. There is far more livestock exclusion fencing in Stony Creek and Pughs Run than in Crooked Run. Participants wanted a better idea of how many farms have cattle with access to the stream. The TMDL study doesn't go down to this level of detail, but there is quite a bit of fencing that could still be installed in all the watersheds.

A participant asked how hayland is contributing so much sediment to the streams, noting that it is typically well vegetated. Another participant responded that erosion can occur when hayland is cut, and that sometimes producers put cattle on hayland to graze. Nesha added that while grass protects the soil from erosion, it does not do as good of a job at holding the soil in place as other types of vegetation. She offered to do a little more research into how loading rates are calculated for hay and share it with participants at the next meeting. A participant noted that there aren't really any good best management practices recommended for hay land beyond tree planting, suggesting we should be careful prescribing too high of reductions for hayland. The group discussed the high costs associated with streambank restoration and urban stormwater best management practices. A balanced approach needs to be taken where costs are factored in to the reductions prescribed to land uses but that also does not place too large of a burden on farmers.

The group returned to evaluation of scenario 1 for Crooked Run. Nesha tested for consensus on selecting scenario 1 but found that several participants could not support it. The group came up with a modified approach wherein Nesha would reduce the reduction for cropland and increase reductions for developed areas and streambank erosion and return to the group with an updated scenario for consideration. Consensus was reached on this approach for Crooked Run.

Participants moved on to evaluate scenarios for Pughs Run. Nesha explained that there is a little more wiggle room in this watershed since the reductions needed aren't as high. A participant suggested combining the developed pervious and impervious categories to make things easier to understand. Participants agreed that a similar hybrid approach to scenarios 1 and 2 could be taken in Pughs Run. Concerns was raised regarding limited opportunities for urban BMPs in Pughs Run. There are no larger centralized developments in the watershed, which could make urban BMP implementation difficult of the reductions are too high. They suggested increasing the reduction for streambank erosion and development and reducing the reduction called for on hayland. Consensus was also reached on this approach.

Participants agreed to meet for an additional 10 minutes to evaluate scenarios for Stony Creek. One participant suggested focusing solely on developed areas and streambank erosion in Stony Creek. Some participants felt that this would not be cost effective or possible. Interstate 81 was noted as a concern for the watershed. Participants agreed that greater reductions should be prescribed for developed areas in Stony Creek since development is increasing in the watershed and is clearly connected to streambank erosion, which is the largest sediment source in the watershed. Participants suggested increasing reductions for development and decreasing them for cropland and pasture. A participant asked whether Georges Chicken had any plans in place to expand their facility. They currently do not. The group reviewed current discharge rates and design flows for several permits in the Stony Creek watershed to see how existing conditions compared to permit limits. The Stony Creek Sanitary STP is discharging below its design flow. Participants agreed to the modified scenario in Stony Creek as well.

Nesha offered to prepare the revised scenarios and share them with the group at a final community engagement meeting. Participants discussed how to fund stream restoration projects going forward, using additional grant funds or through the existing agricultural BMP cost share program. Nesha noted that there have been some challenges getting sufficient funding for streambank restoration projects through this program. A representative from the Lord Fairfax Soil and Water Conservation District noted that they were currently working on securing funding for a couple of projects and would keep the group updated on how the process went.

Nesha thanked participants for attending and explained that the next meeting will most likely be held in early February. The meeting was then adjourned.