

## **APPENDIX B**

**Canaan Valley Institute Report on prioritization for acid mine drainage remediation in the Casselman Watershed**



# Mini & Stewardship Grant Programs Final Report Format

[www.chesapeakebaytrust.org](http://www.chesapeakebaytrust.org) / 410-974-2941

To complete the final reporting for your grant, follow the format below to fulfill the requirements for your grant and assist the Trust in collecting important tracking information. Failure to submit final reports may impact future grants. *Any unused funds must be refunded to the Trust.*

## 1. Grantee Information

Organization Name: Youghiogheny River Watershed Organization  
Project Leader: Edgar Harman, President  
Grant Number: 8580

## 2. Summary of the Project

*Summarize the implementation of the project and describe how you achieved the grant deliverables. Describe any public involvement in the project that has occurred, including the specific roles of volunteers in project activities. Also, describe any outreach or educational activities (e.g. training, brochures, press releases, or public events) related to the project that has occurred. You may attach photos, digital images, newsletter articles, or press clippings to supplement your written description.*

YRWA contracted Canaan Valley Institute (CVI) to work collaboratively with MDE-Bureau of Mines (BOM) and DNR-Inland Fisheries (DNR) to conduct Sub-Watershed and Project Prioritization for acid mine drainage (AMD) remediation and brook trout restoration in the Casselman River Watershed. CVI created a Geographic Information System (GIS) using data from a 2004 assessment of the Casselman Watershed performed by BOM, as well as water quality data gathered by BOM from acid mine seeps in 2007, and brook trout distribution and habitat conditions gathered by DNR in 2007. CVI used sub-watersheds previously defined by BOM, which included the Main Stem of the Casselman (MSC), North Branch 1 (NBC1) and North Branch 2 (NBC2), South Branch 1 (SBC1) and South Branch 2 (SBC2). Ranking was done using a prioritization template. Each sub-watershed was assigned scores for each acid and biological indicator. Acid indicators included pH readings from hack and lab tests, stream miles impaired by pH during high and low flow, and sampling sites that did not meet pH standards at high and low flow. Biological indicators included indices for biotic integrity for fish and macro-invertebrates, and the presence of brook trout and habitat scores at sites sampled in 2007. Sub-watersheds were also given scores for the number of abandoned mine shafts. CVI created scores by counting the number of stream miles or sample points for each of the indicators within each sub-watershed. Scores were then multiplied by the relative importance of that particular indicator, to create a weighted score. To reflect the need for AMD remediation, poor pH values, pH samples taken at abandoned mine sites (hack and lab tests) were given greater weight among acid indicators. To reflect the potential for quick biological recovery upon remediation of AMD problems, good biological scores were given greater weight than poor biological scores. Sub-

watersheds with the highest total weighted scores were given a higher rank, or priority, for AMD restoration and brook trout restoration.

CVI developed an initial ranking of Sub-Watersheds for AMD remediation and brook trout restoration, and facilitated a meeting with BOM and DNR to review the rankings in September, 2007. Upon review of the initial sub-watershed rankings, project partners suggested that individual streams would provide a more appropriate scale for prioritizing among potential AMD remediation and brook trout restoration sites. To avoid potential difficulties and delays dealing with multiple private landowners, project partners also decided to include only those streams with headwaters on lands within the Savage River State Forest. Partners also emphasized the importance of finding sites that were easily accessible for depositing limestone fines or building limestone leach beds, or other low-cost, low-maintenance AMD remediation systems.

CVI re-compiled the data to prioritize among individual streams with headwaters in State Forest land. As illustrated in the attached map packet, these streams included Little Shade Run and Spiker Run on the main stem of the Casselman; Un-Named Tributary 1, Tarkiln Run, Un-Named Tributaries 2 and 4, Alexander Run and Un-Named Tributary 11 on the North Branch; Un-Named 12, Un-Named Tributaries 7, 8 and 10, Little Laurel Run, Un-Named Tributaries 5 and 6, and Big Laurel Run on the South Branch. CVI also added scores for the number of road crossings over each stream. These streams were then ranked following the same process as the sub-watershed ranking. And because some of the headwater streams merge before entering either the North or South Branch of the Casselman, CVI developed a separate prioritization template and ranking for tributary groups. Excell worksheets for tributary scores and tributary group scores are attached.

CVI facilitated a review of the revised tributary and tributary group ranking information with project partners and staff from the Savage River State Forest (SRSF) in October, 2007. These new ranking systems met with initial approval. Partners determined that the next step would be to visit potential access points to each stream to better determine access scores, and then to assess the feasibility of leach beds and limestone fine deposits at each access point.

In November, CVI, BOM and SRSF personnel visited potential access points on headwater streams in State Forest Land. The team eliminated the following streams due to access difficulties or lack of site suitability for remediation projects: Little Shade Run, Un-Named 1 (North Branch), Tarkiln Run and Un-Named 4 (a tributary of Tarkiln), Un-Named 12 (South Branch) and Little Laurel Run. On the remaining streams, the team made an initial suitability assessment for leach beds or limestone fine deposits.

In December, CVI met again with project partners to prioritize among potential project sites that had good access and were suitable for leach beds or fine deposits. The team determined that sites with documented AMD problems, but with brook trout present (albeit in small numbers) and good habitat scores should be given greatest priority. In such circumstances, AMD may be the only limiting factor to brook trout and the aquatic ecosystem in general. Minor investments in AMD remediation may allow brook trout populations and the aquatic ecosystem to rebound quickly. According to this criterion, Big Laurel Run, two un-named tributaries of Little Laurel Run, and Spiker Run were determined to be the highest priority sites. Another set of four

accessible sites were also suitable for remediation projects, but may not provide such quick benefits for brook trout and habitat restoration. This set includes an un-named tributary of the North Branch (Un-Named 11), Alexander Run, an Un-Named tributary of Tarkiln Run (Un-Named 2), and an unnamed tributary of the South Branch (Un-Named 8). A third worksheet on project ranks (11x17) is also included in the attached excel file.

In January, 2008, CVI presented these final prioritization results to a meeting of the Youghiogheny River Watershed Association. Several members of the Youghiogheny Chapter of Trout Unlimited were also present. A press release had been issued prior to the meeting, inviting the public to attend. The invitation was transmitted on local radio stations and was written in the local newspaper. Participant input has been incorporated into the data and final report. Subsequently, members of YRWA and staff from BOM and DNR have reviewed and approved the ranking worksheets, map packets and final report form.

### 3. Monitoring and Maintenance

*Describe any monitoring and maintenance that has taken place during the reporting period and/or procedures that are being used to evaluate the relative success of the project in achieving its goals and objectives. When will monitoring results become available?*

DNR conducted aquatic habitat and brook trout assessment during summer of 2007. This, plus earlier MBSS biological data and BOM water quality data provide pre-implementation baseline information. BOM will need to gather additional water quality and flow data in order to further develop specific AMD remediation project designs. Repeated, post-implementation data gathering by MBSS, BOM and DNR would illustrate project impacts on water quality, aquatic habitat and brook trout populations.

### 4. Project Evaluation

*Provide a written evaluation of the project. Describe your greatest success and the biggest challenge. What advice would you give someone considering a similar project?*

Most of the challenges in this project were related to development of a GIS and prioritization system. For example, BOM had developed a comprehensive water quality data set for a 2004 assessment of the Casselman, but much of this data had to be re-entered into a newer (Arc Map 9.2) GIS format for manipulation. Another challenge was to re-compile the data based on individual tributaries, instead of sub-watersheds. While time-consuming, these challenges were necessary steps in an iterative, collaborative process to develop a useful product.

Another challenge was to rank potential AMD remediation and brook trout restoration projects based on incomplete water quality, habitat and fish population data. While some new data was collected during the time frame of this project, more will need to be collected in order to finalize project designs and implementation plans, and more funding sources will need to be identified.

The biggest success of the project was building the partnership between state agencies, YRWA and CVI and funding entities such as the Chesapeake Bay Trust to prioritize potential AMD

remediation and brook trout restoration projects in the Casselman River Watershed, and build support for eventual implementation activities. BOM now hopes to lead an effort, with continued support from its partners, to develop and implement a watershed-based plan for pH on the Casselman River. This prioritization will be one element of that plan. BOM and partner organizations hope to also integrate and implement brook trout restoration activities along with the watershed-based planning work. Further planning and project design will require additional monitoring of water quality and flow characteristics, aquatic habitat and fish populations. These efforts will offer additional opportunities for volunteer and community involvement.

**5. Accounting of Expenditures**

List the accounting of expenditures, showing that awarded funds were spent as intended in the grant request as approved by the Trust. Receipts are not required but may be included if available.

**Itemized Budget:**

<b>STEWARDSHIP GRANT EXPENDITURE</b>	Expenditure
YRWA: contract with CVI for GIS/Prioritization (CBT Stewardship Grant)	\$7500
<b>MATCH FUNDING:</b>	
CVI: approximate match funding (EPA grant)	\$7500
MD DNR: In-Kind Match (biological sampling, data review, participation in prioritization meetings)	\$1900
MDE BOM: In-Kind Match (data review, participation in prioritization meetings and field evaluations)	\$600
<b>TOTAL PROJECT COST:</b>	<b>\$17,500</b>

Total Awarded (CBT): \$7500

Total Spent (CBT): \$7500

Is a refund due to CBT? NO Make refund checks payable to Chesapeake Bay Trust.

**6. Measuring Impact**

Please provide the following information to help the Trust track the impact of its grants. Provide only the information that applies to your grant proposal. An estimate is sufficient for the purposes of the report.

<b>Project Participants</b>	
Estimated number of presentation attendees (YRWA/TU)	20
Estimated number of agency participants (DNR-Fisheries & SRSF, MDE-BOM)	7
<b>Project Resources</b>	
Total matching cash funds (EPA):	\$7,500
Estimated value of match donations:	\$10,000

<b>Restoration Outcomes</b>	
Number of publications produced and distributed:	1
Number of presentations/ workshops given:	3
Number of AMD Remediation/Brook Trout Habitat Restoration Sites identified and prioritized for design and implementation	8
Estimated number of tributary stream miles potentially restored through implementation of AMD remediation and Brook Trout Habitat Restoration Projects	14

## 7. Additional Information and Submitting the Final Report

The Trust welcomes any additional information that you would like to include.



Please return this cover sheet and your final report to: Chesapeake Bay Trust, 60 West Street, Suite 405, Annapolis, MD 21401. Or, email an MS Word attachment to [postmaster@cbtrust.org](mailto:postmaster@cbtrust.org)

Report Prepared By: \_\_\_\_\_

Signature

Date

Todd Miller  
Canaan Valley Institute

For more information, visit [www.chesapeakebaytrust.org](http://www.chesapeakebaytrust.org) or call 410-974-2941.

