1 PROJECT MANAGEMENT

1.1 Title of Plan and Approval

Quality Assurance/ Quality Control Protocol Virginia Save Our Streams Program

Rocky Bottom Benthic Macroinvertebrate Method January 2024

The Virginia Save Our Streams Program (VA SOS)

A program of the Izaak Walton League of	America
locat	
Approvals:	
Margaretta Domboaki	4/23/2024
Margaretta Dombroski, Save Our Streams Coordinator	Date
South	1/31/2024
Samantha Puckett, Clean Water Program Director	Date
H.	4/25/2024
Reid Downer, Virginia DEQ Quality Assurance Coordinator	Date
Meighan Wissuell	4/25/2024
Meighan Wisswell, DEQ Project Manager/Grant Administrator	Date

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1.2 Distribution List

The following groups and people will receive copies of the VA Save Our Streams (VA SOS) quality assurance plan for sampling rocky bottomed streams with the modified VA SOS method:

VA Save Our Stream Staff:

- Margaretta Dombroski, Coordinator
- Matthew Kierce, Coordinator
- Samantha Briggs, Clean Water Program Director
- Other appropriate personnel to be determined

VA Department of Environmental Quality Personnel:

- Quality Assurance Coordinator- Reid Downer
- Biological Monitoring Coordinator- Rick Browder
- Other appropriate personnel to be determined

VA Department of Wildlife Resources

• Shirl Dressler, Wildlife Permit Specialist

US Environmental Protection Agency

• Appropriate personnel to be determined Groups using VA SOS methods

VA SOS Regional Trainers

The quality assurance plan will also be provided to anyone requesting it, and will be made available on the VA SOS website (www.vasos.org).

1.3 Project/Task Organization

Virginia Save Our Streams Program Coordinator or Designee

- Provides training and follow-up testing to volunteers
- Trains additional regional trainers and quality assurance auditors
- Acts as quality assurance auditor when necessary
- Develops and maintains partnerships with groups and agencies across the state
- Assists in site selection
- Assist volunteers who have failed quality assurance procedures to correct problems
- Database manager Reviews all incoming data, assesses for inclusion in database, makes all
 updates to database, makes the data available through reports and on the Clean Water Hub
 (www.cleanwaterhub.org) and the Chesapeake Data Explorer (www.cmc.vims.edu)
- Maintains databases of trained, certified, regional trainers, and quality assurance auditors
- Ensures field sheets and training materials are up to date
- Identifies, analyzes, and stores incoming quality assurance samples
- Identifies incoming unknown specimens for volunteers
- Develops and maintains reference and testing collections

VA SOS Regional Trainers

• Locally trains and certifies volunteers

Maintains equipment needed to train volunteers

VA SOS Regional Coordinators

- Does initial review and updates of local data and sends it to VA SOS Coordinator or designee in a timely fashion
- Makes sure volunteers in their area are progressing to certification and doing their sampling in a timely manner
- May maintain database of local monitoring data and volunteer monitors
- May purchase and maintain approved sampling equipment for volunteer monitors
- May assist in site selection
- May develop and maintain reference and testing collections

VA SOS Quality Assurance Auditors

- Periodically goes into the field with volunteers to review their equipment, procedures, and macroinvertebrate identification
- Sends results of these observations to VA SOS Coordinator or designee in a timely fashion

VA SOS Volunteers

- Attends the proper training and passes the certification test
- Purchases and maintains approved sampling equipment
- Monitors adopted site(s) at least two times a year or assist in the monitoring of other VA SOS monitoring locations.
- Follows proper procedures for maintaining certification status

VA SOS Data Users

There are a wide variety of data users for this statewide program. These users include the Virginia Department of Environmental Quality (DEQ), the Virginia Department of Conservation and Recreation (DCR), the Chesapeake Bay Program, local Soil and Water Conservation Districts, localities, planning commissions, and universities. The VA SOS data is available to any interested party at vasos.org on the Clean Water Hub (www.cleanwaterhub.org), the CMC Data Explorer (www.cmc.vims.edu) or by request.

Virginia Save Our Streams recommends that all potential data users contact the VA SOS Coordinator to discuss the use of the volunteer collected data and the appropriate uses of this data.

1.4 Problem Definition/Background

1.4.1 Problem Statement

With the passage of the Clean Water Act in the early seventies, there has been a focus on cleaning up our nation's waterways. Great strides have been made in reducing point source pollution, or that pollution that enters the stream through a specific known source, such as a discharge pipe. Discharging parties must obtain permits and are regulated to prevent too much pollution from entering our waterways.

While our waterways have greatly improved since these efforts were implemented, there are still steps to be taken. In the last ten years, there has been a shift in thinking to include non-point source pollution in addition to the point sources. Non-point source pollution is hard to regulate, as it comes from a broad area rather than one easily located source. Non-point source pollution includes nutrient additions and

erosion from livestock in streams, runoff of fertilizer from agricultural fields and suburban lawns, and stormwater runoff carrying not just large pieces of litter but also all the oils and chemicals on our roadways and parking lots. It takes a broader monitoring plan to detect these types of pollution and to determine their origin.

This means that already overburdened state agencies must increase the monitoring they must do throughout the state. There are thousands of miles of streams in Virginia that must be monitored, and agencies have very limited resources with which to monitor all these streams. With current workloads and limited resources, it is not feasible that the majority of these streams are monitored on a regular basis. This is where the Virginia Save Our Streams Program helps.

1.4.2 Intended Usage of Data

The Virginia Save Our Streams Program has monitors across the state collecting large quantities of benthic macroinvertebrate data. The data collected under this quality assurance plan will be used in DEQ and DWR water quality assessment reports including the 305(b)/303(d) Integrated Report. It will be used to identify waters were agency scientists will conduct follow-up monitoring to identify if the water should be classified as impaired on the 303(d) report. VA SOS data will not be used to list streams on the 303(d) report. Instead, it can be used to identify pollution incidents when immediate agency response is required to mitigate the pollution event. VA SOS data may also be used in the development and implementation of Total Maximum Daily Load (TMDL) plans.

Data collected as part of VA SOS within the Chesapeake Watershed is also added to the Chesapeake Monitoring Cooperative's database (https://cmc.vims.edu) which is passed along to the Chesapeake Bay Program for use in their status and trends of stream health. In addition, the data collected by VA SOS volunteers can be used locally by Soil and Water Conservation Districts when looking at the effectiveness of implemented best management practices (BMPs). It can also help determine where future BMPs should be implemented. Localities can also use the volunteer data in evaluating current land use practices, to create an integrated water quality management approach to land use development, and to identify pristine conditions so that future developments do not degrade local streams.

1.5 Project/Task Description and Schedule

1.5.1 General Overview of Project

The VA SOS program is ongoing with new volunteer monitors and sample sites continuously occurring. As such training and certification sessions will be held as needed for VA SOS monitors. This training program will continue in perpetuity.

The VA SOS volunteers monitor the benthic macroinvertebrate populations and the habitat of their adopted stream at least two times a year, fall and spring, using a method developed for the VA SOS program by Virginia Tech scientists (Engel 2000). This method is outlined in the Sampling Methods Requirements section of this document (Appendix O). The samples are analyzed in the field using a multimetric index developed as part of the Virginia Tech study. Additional information about the analysis can be found in the Analytical Methods Requirements section of this document. The field analysis gives a water quality score to let the volunteer know if the ecological conditions of the stream are acceptable or unacceptable.

VA SOS volunteers will record general site conditions and fill out a streamside visual assessment sheet.

Data is submitted and reviewed by regional coordinators and the VA SOS Coordinator or designee biannually. Data is compiled in a database that is kept current. Reports are made to interested parties whenever requested, and data is updated to the Clean Water Hub and the Chesapeake Data Explorer annually.

1.6 Quality Objectives and Criteria for Measurement Data

1.6.1 Data Precision, Accuracy, Measurement Range

The VA SOS modified method was developed and tested by scientists at Virginia Tech (Engel 2000) and further tested in 2006 in a study by Virginia Tech (Voshell, 2006) and Virginia Commonwealth University (Garey, 2006), to accurately represent the stream condition and compare favorably with the results VA Department of Environmental Quality professional biologists would find when sampling the same sites. The new method compared very favorably with agency findings, and was found to be a good method for volunteers to use to determine the condition of their streams (Engel 2000). Further evaluation in the 2006 studies compared the VA SOS modified method with the Virginia Department of Environmental Quality's Virginia Stream Condition Index (VSCI). The 2006 studies found that a change in the final VA SOS multi-metric scoring is needed to be more comparable to the VSCI. Specifically the addition of a "gray zone" for intermediate benthic conditions. These changes are reflected in this QAPP and the field sheets found in Appendix A. The 2006 studies can be found in the Appendices.

1.6.2 Data Representativeness

For the VA SOS program, representativeness depends largely upon site selection. Volunteers are requested to select sites that are representative of the stream and the conditions that are influencing the stream (see appendix M). However, volunteers are asked not to monitor below permitted discharges. In selecting a riffle, volunteers survey the stream section to determine the most appropriate and representative riffle. Also, generally more than one sample in the riffle is collected. Each sample is picked in its entirety and the results are composite into the final score.

1.6.3 Data Comparability

VA SOS ensures comparability requiring all volunteers to use the protocol designed by scientists at Virginia Tech. This protocol includes taxonomic keys to identify macroinvertebrates correctly. VA SOS also maintains several sets of reference collections for use by volunteers in the field.

During development of the protocol, comparisons were made with findings from VA Department of Environmental Quality professional biologists at the same sites. The new method compared very favorably with agency findings. The VA SOS multimetric rating is similar to that rating used by DEQ biologists.

1.6.4 Data Completeness

VA SOS does not apply rigorous completion standards to the volunteers collecting data. VA SOS expects each monitoring site to be monitored at least 2 times (in the spring and fall) during the course of a year. The completion of these monitoring events during the year is hampered by several factors: the need for the site (as identified by the monitor or regional coordinator) may have changed during the course of the year or the volunteer may have dropped from the program (the need for the change should be documented and kept with other site information). We do instruct volunteer monitors that monitoring over an extended period of time and during the same approximate times per year provides the most

useful data. Some more established volunteer groups may begin a rotating sampling program, capturing data at a site in the spring and fall of the calendar year and rotating to another site the following year.

1.7 Special Training Requirements/Certification

As the VA SOS program has a hierarchy of volunteers to help administer the program, different training and certification requirements may apply.

VA SOS Volunteer

Persons interested in becoming a VA SOS volunteer must attend at least one training session given by VA SOS staff or a certified regional trainer. This training session includes information about the program and basic watershed education, safety information, instruction in methods of collection and analysis, instruction in macroinvertebrate identification, and hands-on field experience with the methods (Appendix B). After this training event, the volunteer then has up to 24 months to practice the method and identification before becoming certified. This practice can be done alone, with other volunteers, or at other official training sessions. If it has been over 24 months since the volunteer last attended an official training session, they must attend another session before becoming certified. The volunteer cannot be certified during their initial training session. If a volunteer conducts aquatic insect studies as their profession, they may be able to skip the macroinvertebrate identification training session and just take the certification test.

The certification process includes an in-stream observation and a macroinvertebrate identification test. VA SOS staff or a regional trainer must administer the certification procedure. The in-stream observation consists of the volunteer completing an entire sampling session (collecting and processing an entire sample and completing the habitat assessment), while the person doing the certification fills out an observation report (Appendix C). This portion of the test is open book and can be completed as a team with other volunteers attempting certification. If a larger group is being trained, a trainer or VASOS staff may follow up with an online protocol test instead of filling out an observation report (Appendix C).

The identification portion of the process can be taken as a written test with a VA SOS staff or volunteer trainer (Appendix C). There are 24 lettered, unidentified vials containing preserved representatives of groups used in the VA SOS method. The volunteer must identify at least 21 vials correctly in order to pass. Volunteers have up to 90 minutes to complete this test. The identification portion of the process can also be taken online through IWLA's online quiz. Volunteers must identify 38/42 photos correctly or higher to pass the online macroinvertebrate identification quiz.

While this portion of the certification process is open book, it must be completed individually by each individual wishing to become certified.

Within two months of successfully completing both parts of the certification process, the volunteer receives a certificate indicating they are a VA SOS monitor. If the volunteer continues to pass further quality assurance measures (see Quality Control Requirements), (s)he will remain a certified volunteer. If the volunteer misses sampling for two consecutive calendar years, they will lose their certification status and must go through the certification process again.

Quality Assurance Auditor

Volunteers wishing to become quality assurance auditors must have been a certified volunteer for at least six months and have completed at least two monitoring events. During these two monitoring

events, the volunteer must have demonstrated their ability to follow the method by completely and accurately filling out the data forms for all monitoring events.

If the interested volunteer meets these requirements, they attend a training session with VASOS staff that teaches them how to conduct an audit of a volunteer. During this session, equipment needs and condition is covered, as are proper methods. How to complete the audit checklist used during the audit is covered (Appendix D).

The auditor must complete at least two audits every two years to remain an auditor, and must send the audit forms to the VASOS coordinator within three weeks of completion. Incoming audits are reviewed by the Coordinator or designee. If the audit form not be filled out properly, the Coordinator or designee works with the auditor to improve their auditing performance. Should the auditor continually fail to properly complete the forms on more than one occasion, they are required to attend another auditor training session or will lose their auditing status.

Regional Coordinator

As this is a local organization position, no additional training is required to be a regional coordinator. However, the VA SOS staff will remain in close contact with the regional coordinators and will act as a resource to these volunteers. In addition, the Coordinator or designee will remain in close contact with these volunteers to help them learn to assess the incoming data for completeness and how to respond to incomplete data forms.

Regional Trainers

A thorough understanding of benthic macroinvertebrate collection and identification methods and QA/QC procedures implemented by this project and their individual monitoring project. This can be achieved through prior knowledge and experience (as deemed appropriate by the VA SOS Coordinator) or by being a Certified Monitor for at least six months and completing two macroinvertebrate sampling events. During these two monitoring events, the volunteer must have demonstrated their ability to follow the method by completely and accurately filling out the data forms for all monitoring events. The potential trainer must also have observed at least two training sessions implemented by VA SOS staff or regional trainers. The initial training session a volunteer attended to become a monitor may count as one of these sessions. They should also help coordinate one training session before they can be certified as a trainer. In addition, the volunteer must feel comfortable talking in front of a group, and must remember that they are representing the VA SOS program while training volunteers so they must accurately and correctly represent the goals and opinions of the VA SOS program.

Should the volunteer meet these requirements, they must go through an additional training session administered by the VA SOS staff before training other volunteers. This training includes a discussion of what is involved in a training session. A checklist of these items will be given to each regional trainer during this training session (Appendix B). In addition, the training session will cover how to be an effective trainer, frequently asked questions, reference collections, and the certification process. The potential regional trainer must complete the macroinvertebrate identification portion of the certification process again, but must receive a 100% in order to become a trainer. (The same form will be used for both the certification process and the regional trainer process Appendix C).

Once the regional trainer successfully completes the training requirements, they will enter an observational period. VA SOS staff must observe the regional trainer's teaching abilities and demonstration of the protocol for review and comment on the trainer's performance. A training

observation report will be completed at that time and a copy will be returned to the trainer within three weeks of the training (Appendix E). The regional trainer must complete at least one training session and certify at least one volunteer per year in order to remain a trainer. In addition, the trainer must undergo an observation by VA SOS staff in person or by video once every two years.

1.8 Documents and Records

Volunteer Field Sheets

All volunteers complete a field sheet packet at each sampling event (Appendix A). The packet includes a front informational sheet, which includes date, location, sampling team, and some basic physical stream information. The second sheet contains raw macroinvertebrate counts, the third sheet has individual metric calculations, and the fourth sheet is a multimetric index calculation. The fifth sheet is a habitat assessment form.

The volunteer saves a copy of these forms and/or sends either hard copy or digital copy to their regional coordinator. The volunteer or the regional coordinator will submit their data electronically using the VA SOS Database (www.vasosdata.org). The volunteer or regional coordinator will save a hard copy or digital copy of each datasheet for 5 years.

Electronic data submissions will be reviewed by the Coordinator or designee and uploaded to the Clean Water Hub (https://www.cleanwaterhub.org/), where they are permanently saved. Back-up copies of the database are housed permanently elsewhere outside of the main VA SOS office.

Training and Certification Forms

A liability waiver and photo release form sheet should be completed at each training session, whether it is for volunteers, quality assurance auditor, or regional trainer training (Appendix F). Once a volunteer completes all of their certification requirements, the regional trainers or coordinators should complete a Monitor Report Form and send a digital copy of these sheets to the VA SOS office within three weeks of the training session, and retain a copy for themselves. The Coordinator or designee will maintain a permanent database of all volunteers. Back-up copies of this database are housed at the main VA SOS office. Digital copies of Monitor Report Forms will be kept on file in the VA SOS offices for a minimum of five years.

Quality Assurance Forms

A copy of forms filled out by the quality assurance auditor should be sent to the Coordinator or designee within three weeks of the audit (Appendix D). The pass/ fail status of each volunteer will be recorded in the database of volunteers. A copy of the audit will be sent to the volunteer(s) in question, and a copy will be kept on file for a minimum of five years at the VA SOS offices.

All samples preserved for quality assurance purposes (See Quality Control Requirements) must be properly labeled with a sample submittal form (Appendix D). This form will be kept with the sample at all times. After these samples have been identified, the laboratory record sheet (Appendix G) will be housed in the VA SOS records for a minimum of five years, and then recycled. The pass/fail status will be recorded in the database of volunteers, and a copy of this status will be sent to the volunteer(s) in question. Preserved samples will be archived for a minimum of two years, then the organisms will be used in reference collection development or donated to a school, college, or university.

The results of the quality assurance audit and identification check will be sent to the volunteer(s) in question within three months of the audited monitoring event.

Unknown Specimen Submittal

All unknown specimens needing identification by the Coordinator or designee should be photographed and emailed to VASOS staff. After identification, the form (Appendix H) will be completed by the Coordinator or designee. A copy of the form will be filed in the VA SOS offices for a minimum of five years, and a copy of the form and the photograph will be returned to the volunteer. Submitted data that is quality assured should not have more than 5 unknowns in the sample.

2 DATA GENERATION AND ACQUISTION

2.1 Sampling Design

Volunteers collect macroinvertebrate samples and complete habitat assessments twice a year, in the spring and the fall. While sampling can occur any time during a season, it is recommended that sampling occur between March 1^{st} – May 31^{st} and September 1^{st} – November 30^{th} , on a regular basis (Appendix J). Descriptive location information and latitude and longitude identify each monitoring site.

Most volunteers have a specific stream they wish to monitor. Often, this stream is located in close proximity to their home, or they spend time on the stream for recreational purposes. To promote continued interest and involvement in the VA SOS program, it is important that volunteers be allowed to monitor these locations. Some monitors do not have a specific spot in which they are interested, but rather wish to monitor somewhere in their watershed of interest. In such a case, VA SOS staff with representatives from DEQ and DCR, will use GIS maps and the Clean Water Hub, to assess where current volunteer and agency monitoring is occurring, and help the volunteer choose the most appropriate site. Site selection will also take in consideration potential uses of the data (background information, assess effectiveness of BMPS, monitor land use changes, etc). All sites must be located on public property, or the volunteer must obtain written permission if they choose to monitor private property. Sites are added to the program as often as new volunteers are trained. Sites may also be changed if the need for the monitoring site has changed. For example, if a volunteer chooses a site below a construction site to evaluate potential impacts, once the construction is complete, the volunteer may choose to abandon the site. See Appendix M for detailed site location directions.

Volunteers are not to conduct their normal sampling within one week of heavy rainfall (approximately more than 1 inch of rainfall in rural areas or ½ inch of rainfall in urban areas). Rather, they should sample the stream during its average conditions for that season, and can use the USGS stream gauge website as a guide (https://waterwatch.usgs.gov/?m=real&r=va).

DWR must be notified of streams that are to be sampled prior to the sampling events. As soon as volunteers know where and when they will be sampling, or at least 48 hours in advance, volunteers must notify DWR by emailing CollectionPermits@dwr.virginia.gov with the sampling date, station ID, and permit number (provided by VA SOS). Before monitoring at a new site, volunteers should confirm the location with VA SOS. VA SOS staff will confirm that the site is not in proximity to threatened or endangered species as listed on the DWR website at: https://vafwis.dgif.virginia.gov/fwis/.

Should there be heavy rain, the sampling must be postponed allowing the stream to return to normal conditions.

If the volunteer is not going to be able to complete their sampling for a season, they should alert their regional coordinator or the VA SOS staff, and assist them in locating a substitute volunteer for that season.

2.2 Sampling Methods

Required equipment includes a mesh kick-seine with mesh size no greater than 1/32", a white sheet to place under the net, forceps, a plastic container in which to sort bugs, collection jars and alcohol for collecting unknown specimens, a magnifying glass, pencils, stream shoes, field sheets and a simple

calculator. Volunteers are responsible for purchasing and maintaining their own equipment. When funding allows, VA SOS may be able to provide equipment reimbursement for approved items. The VA SOS program provides volunteers with a list of needed equipment and approved vendors found on the IWLA (https://www.iwla.org/conservation/water/save-our-streams/biological-monitoring-equipment-and-forms) and VASOS websites (http://www.vasos.org/monitor-page/equipment-list/). In the instance when VASOS volunteers are monitoring to Family- or Genus-level, volunteers should use a 500 micron or similar mesh kick-seine instead.

Choosing where to sample within the stream

Volunteers select a riffle typical of the stream, that is, a shallow, fast-moving area with a depth of 3 to 12 inches (8 to 30 cm) and stones, which are cobble-sized (3 to 10 inches). Stone size is important since the macroinvertebrates surveyed prefer these stones for protection and food supply. In addition, the bubbling of water over the rocks provides needed oxygen for healthy growth.

How to Sample

Volunteers place the kick seine perpendicular to the flow of water immediately downstream of the 1 foot² area in the riffle they have selected to sample. The bottom, weighted edge of the net should fit tightly against the stream bottom. Volunteers use cleaned rocks from outside the sampling area to hold the net firmly to the bottom. This prevents insects from escaping under the net. Volunteers tilt the net back, so the water flowing through the net covers a large portion of the net, however, they are careful not to tilt the net so much that water flows over the top, allowing organisms to escape.

A volunteer quickly samples the targeted area for 20-90 seconds. A minimum net time of 12 seconds can be used with permission under approved circumstances. To sample, the monitor will lift and rub underwater all large rocks in the sample area to dislodge any clinging organisms. They will rub all exposed surfaces of rocks in the sampling area that are too large to lift. Rock rubbing will be done for 75% of the chosen net time They will then dig around in the small rocks and sediments on the streambed in order to dislodge any burrowing macroinvertebrates. Disturbing the substrate will be done for 25% of the chosen net time.

After sampling for 20-90 seconds, volunteers carefully rub off any rocks used to anchor the net. They then remove the seine with an upstream scooping motion, being careful not to allow water to escape over the top of the net, in order to keep all the macroinvertebrates in the net.

For more detailed information about how to sample, reference the VA SOS Volunteer Water Quality Monitoring Manual.

Processing the Sample

Volunteers place the net on a flat, light colored surface, such as a white sheet, table, or piece of plastic. This makes the organisms easier to see. Using forceps or their fingers, volunteers gently pick all the macroinvertebrates from the net and place them in a collecting container. Volunteers carefully look on both sides of any debris in the sample, as many insects will cling to any available litter. They look closely for very small organisms. It is important to thoroughly pick all the organisms from the net. Once all the organisms have been sorted off the net, the net is lifted and the underlying area is examined. Any organisms that have crawled through the net are collected. Again, it is important to collect all these organisms to have an accurate sample.

Once all the macroinvertebrates are removed from the seine and underlying sheet, the number of organisms in the sample is counted. If at least 200 organisms have not been collected, another net must

be collected from a different riffle spot in the same area. The organisms from the second net are added to the first. The length of sampling time can be adjusted depending on the number of organisms collected in the first, with the maximum sampling time per net being 90 seconds. The second and subsequent nets can have a minimum sampling time of 12 seconds. The second net and area beneath are again sorted in their entirety. Again, the organisms are counted, and a third net is collected if 200 organisms have not been obtained. This process is repeated until at least 200 organisms are found or 4 nets are collected, whichever is first. Each net collected must be sorted in its entirety, even if that leads to a sample of well over 200 organisms.

Once at least 200 organisms have been obtained or 4 nets have been collected, the organisms are separated into look-alike groups, using primarily body shape and number of legs and tails, as the same family or order can vary considerably in size and color. Volunteers use the tally sheet (Appendix A), the macroinvertebrate identification card (Appendix K), and other reference materials as to aid in the identification process. Volunteers record the number of individuals they find in each taxonomic group on the tally sheet. The tally sheet has one box set aside for "other aquatic macroinvertebrates". Volunteer should note the number and type (if known) of aquatic macroinvertebrate not included in the tally sheet. The number put in this box will be included in the total number of organisms found in the sample. Please do not use this box to document fish, salamanders or other aquatic or semi-aquatic organisms. When identification and recording are completed, samples are returned to the stream unless the quality assurance audit is occurring (See Quality Control Requirements). All equipment should be thoroughly rinsed at this time so as not to contaminate future samples.

For more detailed information about how to process the sample, reference the VA SOS Volunteer Water Quality Monitoring Manual.

Habitat Analysis

Volunteers complete a qualitative streamside visual analysis that assesses the general conditions in the stream (Appendix A) every time they conduct a biomonitoring session. Some parameters require volunteers to pick the most representative description for their sites, while other parameters require volunteers to determine percentages present at their site. Guidelines for completing the habitat analysis are available to the volunteers on the VA SOS website (www.vasos.org) or in the Save Our Stream's Monitor's Guide to Aquatic Macroinvertebrates (Kellogg 1994). These data are used to gain perspective on the macroinvertebrate data collected from the same site.

2.3 Sampling Handling and Custody

Unknown Specimens

Individual organisms that volunteers collect but cannot identify should either be preserved and sent to the VA SOS office for identification (see instructions below) or alternatively, a picture or video of the organism may be taken for identification.

If the organism is preserved, please place organism in a vial and fill with >90% rubbing alcohol (available at a local drugstore), label properly (Appendix H), and sent to the VA SOS office for identification or delivered to VA SOS employee at an appropriate time. The label should be written in permanent ink or pencil and placed inside the sample container. The volunteer is responsible for all costs associated with delivering the sample to the VA SOS office. The VA SOS program will return the identified sample to the volunteer for future reference.

If the organism is photographed, take as many photographs as possible to document the number of legs/appendages (if any), the head and mouth features, the thorax and abdomen (top and bottom if possible), any tail features, and other distinguishing characteristics. In addition, a photo with another object (like a ruler) in the picture for scale purposes is helpful. If taking video shots of the organism is possible (e.g. smartphone), record the organism as it moves around the container. Send photos and video to the SOS Coordinator at vasos@iwla.org

2.4 Analytical Methods

Volunteers use a multimetric index based on six individual metrics to analyze their macroinvertebrate data. Scientists at Virginia Tech developed this index for the VA SOS volunteers (Engel 2000). Volunteers complete the index by following the steps in four tables found on pages three and four in the field sheet packet (Appendix A). The results of the multimetric index are calculated to determine if stream condition is acceptable or not. There is no real analytical procedure for analyzing the results of the streamside visual analysis. Rather, the results from this analysis are used to help the data users understand the scores obtained by the macroinvertebrate samples.

2.5 Quality Control

There are four quality control requirements that VA SOS maintains for its monitoring program.

Training and Certification

All Virginia SOS volunteers must attend an initial training session and complete a subsequent certification test. See the Training Requirements/Certification section for details on these quality assurance efforts. Upon the completion of these requirements a volunteer is considered a certified monitor. Certified monitors go through the rigors outlined in this quality assurance plan and provide data for the state water quality agencies. If a certified monitor does not collect and submit data to the VA SOS office during the two year period after their initial certification, they are considered inactive and must go through the training and certification process again. VA SOS monitors are those who routinely monitor their sites (at least twice a year) are considered active certified monitors and must maintain their quality assurance status by participating in the field and lab audits as outlined below.

Reference Collection

VA SOS staff and regional trainers and/or coordinators have a complete reference collection of macroinvertebrates for volunteers to use during the course of their sampling. VA SOS staff is responsible for maintaining these reference collections.

Field and Lab Audits

All certified monitors must undergo periodic quality assurance audits. VASOS staff and/or regional trainers and coordinators will conduct audits of 5% of monitoring events held each year, to be selected randomly. The quality assurance audits involve a field visit by a quality assurance auditor or VASOS staff. The auditor reviews all volunteer materials to check that the proper equipment is used and is functioning properly. In addition, the auditor watches the volunteers collect and process their sample. The auditor uses a checklist (Appendix D) to assure the volunteers are correctly completing their sampling event. The completed auditing forms are sent to VA SOS staff. The forms are reviewed by VA SOS staff. Should the volunteers fail their audit, the VA SOS staff will work with the volunteer to update their equipment and/or collection and processing methods. The volunteers must have each sampling event audited until they pass. Once a volunteer fails an audit, their certification is revoked until they

successfully complete an audit. Should the volunteer fail three audits in a row, they must attend a training session with an official trainer to refresh their sampling methods.

The auditor will identify and tally the volunteer-processed sample in the field once the volunteers' identification process is complete. The auditor will submit their field audit identification sheet (Appendix G) along with the data sheet of the group he or she just audited. Should the volunteer fail to correctly identify a significant portion of the sample (over 10%), their certified status will go on hiatus. The VA SOS staff will work closely with the volunteer to help them learn troublesome organisms. The volunteer must successfully complete the macroinvertebrate identification test (See Training and Certification) in order to re-instate their certified status. The volunteer must preserve their next sample after their certification status is re-instated for review by the Coordinator or designee. Should the volunteer fail that identification check, they must go through a training session with an official trainer and must once again go through the certification process in order to be a certified volunteer.

Method Evaluation

As requested, VA SOS staff will make VASOS data available for comparison with DEQ data taken in the same sampling sites for evaluation of VASOS methods.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

Each VA SOS volunteer will be responsible for maintaining their own equipment. Prior to each monitoring event, the volunteer should check their net for cleanliness and for any small rips or holes. A sewing repair kit should be included in each kit, and small holes and rips should be repaired prior to sampling. If the hole or rip is of substantial size (irreparable), the volunteer is responsible for obtaining a new net prior to sampling. The sheet for under the net should also be cleaned and repaired as needed prior to sampling.

In addition, each volunteer is responsible for keeping the rest of her equipment up to date, clean, and in good condition. The volunteer is responsible for repairing or replacing all necessary equipment. The volunteer is also responsible for having the proper field sheets with them, either by making copies or downloading them from the VA SOS website (www.vasos.org). The volunteer should have the most current, up to date field sheets available.

The Quality Assurance Officer will review all equipment and supplies during the field audit.

The VA SOS program will assist volunteers in keeping current, functioning supplies by providing volunteers recommendations as to where to purchase equipment on the IWLA (https://www.iwla.org/conservation/water/save-our-streams/biological-monitoring-equipment-and-forms) and VASOS websites (http://www.vasos.org/monitor-page/equipment-list/) The VA SOS program will keep all necessary documents current on the website, and will supply copy masters of these documents to those volunteers without Internet access.

2.7 Instrument Calibration and Frequency

No calibration is needed for macroinvertebrate collection/ processing equipment. However, the Quality Assurance Officer will review all equipment during their visit with the volunteer.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables

All equipment must meet specifications for VA SOS macroinvertebrate collection. Kick seines must be approximately 3 ft x 3 ft, and must have at mesh size no greater than 1/32". These nets can be purchased from an approved supplier or the VA SOS program. The sheet must be at least the same size as the net, if not larger, and may be obtained at a local supply store. All other supplies may be obtained from a local supply store or through catalogs, and are subject to review during the Quality Assurance Officer's regular visit.

The VA SOS program encourages its volunteers to be innovative in order to improve the collection and analytical process. However, all innovations must be reviewed by the VA SOS state office either in person, by mail, or through photographs prior to their use in data collection.

2.9 Data Acquisition Requirements

The VA SOS uses collection and analytical methods for benthic macroinvertebrates developed for the program by Virginia Tech scientists (Engel 2000). Google Maps and the Clean Water Hub are used for site selection and land use data. Google Maps is used to determine the latitude and longitude of a volunteer's site. Current stream conditions can be obtained at https://waterwatch.usgs.gov/?m=real&r=va. Forecasted rainfall intensity can be obtained either at www.wunderground.com or https://www.wpc.ncep.noaa.gov/qpf/day1-3.shtml. An almanac of previous rainfall levels can be obtained at www.wunderground.com.

Some VA SOS volunteers also collect chemical parameter data. When this information is reported to the VA SOS database manager, it is included in the master database under the memo field (not searchable). However, their chemical data is not covered by this QAPP. Those volunteers collecting chemical data should create and submit their own quality assurance plan for that monitoring.

2.10 Data Management

Field sheets (Appendix A) are filled out completely by the volunteers in the field. The volunteer should review their data sheets from each sampling event to make sure they are filled in as completely and accurately as possible. The volunteers have four weeks to submit their data hardcopy or electronically, keeping a copy of the data themselves.

Where available, field sheets are sent to the regional coordinators, who review the data for completeness. Should there be any data gaps, the regional coordinators contact the volunteers to fill in the missing information as much as possible. The regional coordinators must send their region's data to the VA SOS staff electronically (or hardcopy if necessary) within three weeks of obtaining all of that season's monitoring reports for their area. Again, the regional coordinators keep a copy of all data forms. Where no regional coordinator is available, the VA SOS Coordinator or designee acts as first reviewer of data.

The VA SOS Coordinator or designee reviews all data coming to the state office. Should there still be missing or incorrect information, the Coordinator or designee works with the volunteers, regional coordinator, and maps if necessary to fill in the gaps. VA SOS staff has final say over whether the data is complete enough to be entered in the state database by VA SOS staff. The VA SOS Coordinator or designee also maintains a database of all volunteers and their certification status, so can appropriately mark data as certified or not. The database will contain all data from all years. Hardcopy forms will be filed and kept by monitors and regional coordinators for a minimum of five years from its collection. After this time, the data forms will be recycled.

Monitoring data will be delivered in electronic database form to the Department of Environmental Quality every other year, or when requested. The database is reviewed and manipulated as needed by the DEQ Quality Assurance Coordinator, who works closely with the VA SOS Coordinator or designee to correct any problems found in the database.

Other organizations requesting the data are responsible for reviewing the database in accordance with their data needs.

The VA SOS staff will also keep data available for easy review by all interested parties on the Clean Water Hub and in the CMC Data Explorer. The data on the website will have gone through reviews by the VA SOS Coordinator or designee, and will be updated biannually. Data request needs that cannot be met by the internet data retrieval site should be made in writing. Data will be label with the following: "This data is intended for uses outlined in our most recent Letter of Agreement with state and federal natural resource agencies."

3 ASSESSMENT AND OVERSIGHT

3.1 Assessment/Oversight and Response Actions

A quality assurance auditor will review the field performance and equipment of all certified volunteers as outlined in the Quality Control Requirements section. In addition, the volunteer's identification skills will be reviewed by VA SOS staff through preserved samples in conjunction with a monitor's quality assurance audit (see Quality Control Requirements). Corrective actions, if necessary, will be taken and are discussed in detail in the Quality Control Requirements section.

All field sheets will be reviewed for completeness and anomalies by the collecting volunteer, regional coordinator, and VA SOS Coordinator or designee. Should any problems be detected, the involved parties will work together to fix the problem and assure future field sheets will be complete and meet quality assurance standards. Should the problem be irreparable, the VA SOS Coordinator or designee may decide not to include the data in the statewide public database.

3.2 Reports and Management

The data collected by the VA SOS volunteers will be available to anyone interested on the Clean Water Hub (www.cleanwaterhub.org) and the CMC Data Explorer (www.cmc.vims.edu) The websites are updated biannually, and contains highlights of the data from each site. Those parties interested in seeing the full data from any site can request such from the VA SOS program but can also see the full results on either of the data portals listed above. A full report will be made to the requesting group within three weeks of said request. Full data sets will not include the name of the certified monitor, but may include the organization name (such as Streamwatch or Friends of the Maury River).

Reports, in terms of the full database from the last five years, are made to the VA DEQ every other year or when requested. Should other information, such as information about passage of quality assurance audits and identification passage, be required, it will be delivered upon request. Data collected when a volunteer has failed to pass a quality assurance check will be marked as uncertified when submitted to the DEQ.

As the database of volunteer data will be marked appropriately with certification status, the "raw" results of the quality assurance tests will not be available unless requested, and specific names will only be provided to the Department of Environmental Quality and other appropriate agencies, and to the regional coordinators. The names of volunteers having quality assurance troubles will not be made public to any other interested parties. However, statistics such as percentage passed in each watershed or overall will be available by request and on the VA SOS website.

4 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements

All data sheets are reviewed by the collecting volunteer, the regional coordinator where appropriate, and the VA SOS Coordinator or designee. In addition, the DEQ Data Liaison reviews the database once every other year. The decision to accept or reject data is made by the VA SOS Coordinator or designee.

Data entry is checked for errors as it is entered. Data will be entered into a spreadsheet set up to calculate metrics and final scores. Should the scores in the spreadsheet be different from those calculated by the volunteers, the data will be reviewed for accurate entry. Habitat assessments are mainly ranges of scores, and these will be reviewed at the time of entry.

4.2 Verification and Validation Methods

The data will be reviewed for any inaccuracies and gaps and will be updated as described in the Data Management Section. Data will be updated as available. The VA SOS Coordinator or designee makes the final decision as to whether or not the data is complete and accurate enough to include in the database.

All quality assurance data will also be reviewed and recorded by the Coordinator or designee, as described in the Quality Control Requirements section. Any problems will be dealt with as described in that section by the VA SOS staff.

All data reported to users will have undergone all reviews and will have passed all completeness and accuracy tests prior to reporting.

4.3 Reconciliation with User Requirements

Precision and Accuracy

The precision and accuracy of the VA SOS monitoring program is evaluated during the quality assurance audits and at the time the method is evaluated. If a volunteer fails the quality assurance audits, they must go through corrective action as outlined in Section 2.5, Quality Control Requirements.

Representativeness

The representativeness of the sample will be evaluated during data entry and during the field portion of the quality assurance audits. VA SOS will evaluate the site sampled during data entry (or data review) to make sure the site is representative of the conditions in the area. During the data review, VA SOS staff will also make sure that more than 200 organisms were selected and that the riffle was sampled for the appropriate amount of time and the appropriate number of times. The quality assurance auditor will make sure the volunteer chooses the most appropriate riffle in the course of the field audit and that the riffle is sampled for the appropriate length of time and number of times. If either course indicates the site location is not representative or the riffle was not sampled in a representative manner corrective actions as outline in Section 2.5, Quality Control Requirements, will be taken.

Comparability

Adherence to the VA SOS protocol will be evaluated periodically as outlined in the quality assurance audit section. At the same time the ability to correctly identify the macroinvertebrates will be

determined through the field audit. If the volunteer does not successfully complete either element, corrective actions as identified in Section 2.5, Quality Control Requirements will be taken.

The VA SOS Method will also be evaluated upon request by the Department of Environmental Quality to ensure comparability. During the method evaluation process, if the VA SOS method does not correlate with the DEQ order level ID method 90% of the time, the VA SOS method will not be considered comparable and will undergo scientific evaluation and validation to make any necessary changes to the actual collection method or the metrics that are calculated.

Completeness

VA SOS will continue to encourage its volunteers to conduct sampling at their sites at least 2 times a year. This will be considered a complete sample set. No corrective action will be taken if a volunteer fails to monitor their site 2 times during a year, but the data may not be considered as useful by VA SOS or data users.

5 REFERENCES

Chesapeake Data Explorer. www.cmc.vims.edu.

Clean Water Hub. www.cleanwaterhub.org.

Engel, S.R. 2000. The effectiveness of using volunteers for biological monitoring of streams. Masters Thesis, Department of Entomology, Virginia Polytechnic Institute and State University.

Voshell, J.R. 2006. Validation of the Modified Virginia Save Our Streams Protocol. Department of Entomology, Virginia Polytechnic Institute and State University

Garey, A. 2006. Comparison of Virginia Save Our Streams and Virginia Stream Condition Index Scores in Streams of the Eastern Piedmont of Virginia. Department of Biology, Virginia Commonwealth University

Kellogg, L. 1994. Monitor's guide to aquatic macroinvertebrates. The Izaak Walton League of America, Gaithersburg, Maryland.

<u>Save Our Streams Equipment List. www.iwla.org/conservation/water/save-our-streams/biological-monitoring-equipment-and-forms.</u>

Virginia Save Our Streams Equipment List. www.vasos.org/monitor-page/equipment-list/

6 APPENDIX

Appendix A: Macroinvertebrate and Habitat Field Sheets

Also available for download at www.vasos.org







Biological Monitoring Data Form for Rocky Bottom Method

Name of Stream:		Sta	ation ID:		
Name of Certified Mo	nitor(s):				
roup/Organization:Number of Participants:					
atitude:Longitude:					
County/State:					
Survey Date:	Start Time:			End Time:	
Description of Site Lo	cation:				
ROCKY BOTTOM S	AMPLING				
the time rubbing rocks sampling period to ens sampling period in sec	, take up to four samples s, 25% of the time disturb sure you collect at least 2 conds and place a check r t reach 200 organisms, thre	oing th 200 ma mark n	e streambe acroinverte ext to the	ed). Adjust the lea ebrates. Write the net mesh size use	ngth of the e length of each ed
Net1	Net 2Net 3		Net 4	Net Mesh Size:	1/32" 1/50"
Today: Yesterday:	CIONS (check all that approximately Covercast ☐ Sunny ☐ Overcast ☐ Sunny ☐ Overcast ☐ Sunny ☐ Overcast ☐	Interr	nittent Rain	Steady Rain	Heavy Rain ☐ Snow
Water Temperature: _		C°	Avg. Stre	am Width	ft.
Flow Rate:	(high, norma	l, low)	Avg. Stre	am Depth	in.
OTHER COMMENT	s				
BIOLOGICAL MONITOR	ING DATA FORM FOR ROC	KY BO	TTOM STRI	EAMS	1

AAinvolutohunto	Tallo.	2	Manualmunukahunta	TAIL	7t
INIGCI OIIIVEI LEDI GLE	lally	Count	Macioniver	ially	Coult
Worms OS			Common Netspinning Caddisflies		
Flat Worms			Most Caddisflies (not Common Netspinning)		
Leeches			Beetles		
Crayfish					
Sowbugs			Midges		
Scuds			Black Flies		
Stoneflies			True Flies		
Mayfiles			Gilled Snails		
			Lunged Snails		
Dragonflies and Damselflies			Clams		
Alderflies, Fishflies, and Hellgrammites			Other benthic macroinvertebrates		
			Total number of organisms in the sample (include "other" category)		
BIOLOGICAL MONITORING	BIOLOGICAL MONITORING DATA FORM FOR ROCKY BOTTOM STREAMS	/ STREAMS			2

MACROINVERTEBRATE COUNT

INDIVIDUAL METRICS

	Organism Groups	Number of Organisms		Total Number of Organisms in the Sample		Percent (This is your value for this metric.)
Metric 1	Mayflies + Stoneflies + Most Caddisflies (not Common Netspinning)		÷		Multiply by 100	%
Metric 2	Common Netspinning Caddisflies		-		Multiply by 100	%
Metric 3	Lunged Snails		÷		Multiply by 100	%
Metric 4	Beetles		-		Multiply by 100	%

Metric 5: Tolerant

Organism Groups Number of Organisms

Black Flies	
Clams	
Dragonflies and Damselflies	
Flatworms	
Leeches	
Lunged Snails	
Midges	
Scuds	
Sowbugs	
Worms	
Total Tolerant	
÷	
Total number of organisms	
in sample	
Multiply by 100	
Percent (This is your value for Metric 5.)	%
(This is your value for wiethes)	

Metric 6: Non-Insect

Organism Groups Number of Organisms

Clams	
Crayfish	
Flatworms	
Gilled Snails	
Leeches	
Lunged Snails	
Scuds	
Sowbugs	
Worms	
Total Non-Insect	
÷	
Total number of organisms in sample	
Multiply by 100	
Percent (This is your value for Metric 6.)	%

MULTIMETRIC INDEX (STREAM HEALTH SCORE)

	Metric Organism	Your Metric Value	2	1	o
Metric 1	Mayflies + Stoneflies + Most Caddisflies (not Common Netspinning)		Greater than 32.2	16.1 - 32.2	Less than 16.1
Metric 2	Common Netspinning Caddisflies		Less than 19.7	19.7 - 34.5	Greater than 34.5
Metric 3	Lunged Snails		Less than 0.3	0.3 - 1.5	Greater than 1.5
Metric 4	Beetles		Greater than 6.4	3.2 - 6.4	Less than 3.2
Metric 5	Tolerant		Less than 46.7	46.7 - 61.5	Greater than 61.5
Metric 6	Non-Insects		Less than 5.4	5.4 - 20.8	Greater than 20.8
			Total # of 2s:	Total # of 1s:	Total # of Os:
			Multiply by 2:	Multiply by 1:	Multiply by 0:
		SUBTOTALS			

Add the three subtotals to get the Save Our Streams Multimetric Index Score:	
Acceptable Ecological Condition (9 - 12)	
Ecological conditions cannot be determined at this time/Grayzone (8)	
Unacceptable Ecological Condition (0 - 7)	

STREAM CONDITIONS

Fish water quality indicators:	Barriers to fish movement:	Surface water appearance:	Streambed deposit (bottom):
scattered individuals scattered schools trout (pollution sensitive) bass (somewhat sensitive) catfish (pollution tolerant) carp (pollution tolerant)	beaver dams man-made dams waterfalls (>1 ft.) none other	clear clear, but tea colored colored sheen (oily) foamy milky muddy black grey other	grey orange/red yellow black brown silt sand other
Odor: musky oil sewage other none	Stability of streambed (bed sinks beneath your feet in): no spots a few spots many spots	Algae color: light green dark green brown coated matted on stream bed hairy	Algae located: everywhere in spots % covered
Stream channel shade: full (more than 75%) high (50% - 74%) moderate (25% - 49%) slight (1% - 24%) none	THE PROPERTY OF THE PROPERTY O		
Indicate whether the following moderate (M), slight (S), or not the control of th	Urban uses (parkin Sanitary landfill Active constructio Mining (type:	the quality of your stream. ng lots, highways, etc.) n n	Agriculture (type:) Trash dump Fields Livestock pasture Other
COMMENTS: Describe the potential future threats to the potential future threats to the potential future threats to your region to the VA SOS Coordinator at vasos please contact the VA SOS Coordinator.	e stream's health.	nline at www.vasos.org. If you have any q	uestions about this protocol, please

BIOLOGICAL MONITORING DATA FORM FOR ROCKY BOTTOM STREAMS

Appendix B: Training Session Checklist

Training Agenda: Initial VA SOS Training

- 1. Introduce self and the VA SOS program
 - a. Describe the VA Division of the Izaak Walton League of America
 - b. Provide Background information and describe the VA SOS method
- 2. Explain what a watershed is
 - a. Describe point source vs. non-point source pollution
- 3. Explain difference between chemical and biological monitoring
- 4. Explain macroinvertebrates
- 5. Types of pollution
 - a. Toxic
 - b. Sediment
 - c. Nutrients
 - d. Bacteria Health hazard not readily identifiable with macroinvertebrate biomonitoring
- 6. Safety Stress especially with children
 - a. Monitor with a group
 - b. Wash hands gastro-intestinal problems
 - c. Cuts and scrapes use peroxide
 - d. Sample in pairs
 - e. Watch for glass
- 7. Discuss critters and their identification individually
- 8. Discuss the importance of uniformity of method QA/QC issues
- 9. Demonstrate metric calculation and multimetric calculation
- 10. Demonstrate and describe method
 - a. Inspect net
 - b. Pick riffle
 - c. Approach from downstream
 - d. Anchor net rocks from outside sample area
 - e. Rub cobbles & dig substrates 1 ft², 20 sec
 - f. Wash anchors
 - g. Scoop forward
 - h. Release vertebrates
 - i. Careful to table
 - j. Sort and ID ALL
 - k. Count need 200
 - I. Additional nets if necessary
 - m. Max 4 nets
 - n. Max 90 secs/net, min 12 secs/net (after first net)

- 11. Demonstrate Books, Resources, Discuss Partners
 - a. DEQ
 - b. DCR
 - c. DWR
 - d. Dept. of Forestry
 - e. SWCDs & NRCS
 - f. IWLA Chapters
 - g. Local Colleges
 - h. Regional Trainers
 - i. VA SOS staff
- 12. Cooperate with state and local decision makers
- 13. Why do we need to monitor?
- 14. What happens to the data & how to choose sites (contact DEQ so don't duplicate efforts)
- 15. Establish monitoring councils & join watershed roundtables encourage diverse participation. Everyone has a skill to contribute even if they don't want to be a "front line monitor"
- 16. What volunteers should do next
 - a. Get certified
 - b. Monitor & report data to VA SOS
 - c. Become a Regional Trainer or Quality Assurance Auditor

Appendix C: Certification Tests







VA SOS Macroinvertebrate Identification Practical Exercise

I rainer Name:	Iraining Date:				
Monitor Name:	itor Name:Score:				
Using the macroinvertebrate groupings found on your tally sheet and bug identification card, identify the organisms in the lettered vials. You may use whatever printed resources you wish. However, you may not discuss the organisms with a friend during this procedure. You must get at least 21 out of 24 correct to pass. Depending upon the specimen set, some macroinvertebrate groupings may repeat or others may not be used.					
Α.	M.				
В.	N.				
C.	0.				
D.	P.				
E.	Q.				
F.	R.				
G.	S.				
Н.	т.				
I.	U.				
J.	V.				
к.	W.				
L.	x.				







VA SOS Rocky Bottom Protocol Observation Checklist

Trainer Name:					
Monitor Name:					
This form has been designed for reviewing the field collection skills of monitors in the Virginia Save Our Streams Program. This form is only to be filled out by official Virginia Save Our Streams Program trainers. A minimum score of eleven must be received in order to pass.					
1. Monitor chose the most appropriate riffle?		Y	N		
2. Monitor disturbed sample area prior to monitoring?		Y	N		
3. Monitor anchored net firmly to stream bottom and checke	d bottom of net for holes or gaps?	Υ	N		
4. Anchor rocks were collected from outside the sampling arbefore being used?	rea and washed outside the net	Y	N		
5. Monitor positioned net to collect maximum flow?		Y	N		
6. Monitor collected organisms only for the specified length	of time?	Y	N		
7. Monitor dug into substrates under rocks during specified t	time?	Y	N		
8. Monitor allowed water to flow over top of net?		Y	N		
9. Monitor cleaned anchor rocks when removing them from	the net?	Y	N		
10. Monitor correctly scooped net from water, preventing was sample from falling off the bottom?	ater from flowing over the top and	Y	N		
11. Monitor quickly picked all organisms from the net and sh	neet?	Υ	N		
12. Monitor showed adequate field identification skills?		Υ	N		
13. Monitor correctly filled out field sheets?		Υ	N		

Izaak Walton League of America Virginia Save Our Streams Online Rocky Bottom Protocol Quality Assurance Test

The following quiz is designed to help you determine your understanding of the Virginia Save Our Streams Modified Method Protocol. You may refer to your written materials, but you may not ask a fellow monitor for help. You must receive a score of 16 out of 18 to pass.

1.		Name (First and Last):		
2.		Date Trained:		
3.	э.	Name two conditions that make it unsafe to monitor at a particular site or at a particular time:		
	ο.			
		Answers can include: water is above the knee, water is rushing too fast, banks are too steep or slippery, thunderstorm with lightning, it is posted that the stream is unsafe for human contact or it looks or smells very polluted (sewage smell, etc)		
4.		What is a riffle?the area where water bubbles over rocks that are cobble-sized (2-12 inches)		
5.		Why is the riffle important to benthic macroinvertebrates?		
		Answers can include: dissolved oxygen is high there, provides hiding places from predators, access to food sources for some macroinvertebrates		
6.		When sampling one or more riffles, you should always work from		
		_downstream toupstream		
7.		Why?So you don't disturb your sampling site before you sample and possibly get an inaccurate result		
		Before sampling, the bottom of the net is secured using cobbles from Inside the sampling area Outside the sampling area		
9.		When using the Virginia Save Our Streams modified method (rocky bottom) protocol,		

which do you do first?

a. b.	=	ling area in front of the net. the sampling area with your fingers or a plastic rake.	
10.	•	ould you spend collecting your first net at a site you have never you are unsure of the water quality?	
a.	20 seconds	you are unbare or the mater quality.	
b.	45 seconds		
c.	90 seconds		
d.	Any amount of time be	etween 20 seconds and 90 seconds	
11.	How many organisms	do you need to collect to calculate a water quality rating?	
	100 organisms		
	200 organisms		
	300 organisms		
d.	It doesn't matter how	many are collected	
12.	How many nets or samples are you allowed to take to reach the total number of organisms needed for a water quality rating?		
a.	One		
	Three -		
	Four		
a.	As many as you need t	o reach the number of organisms needed	
13.	collecting your first san number of organisms of team with too many o	with your stream, you can adjust the amount of time you spend mple to reduce the number of nets you need to get the minimum needed for a water quality rating while not overwhelming your rganisms to count. Your first net can be anywhere from a minimum to a maximum of 90 seconds.	
14.	•	ds taking a sample from the stream,15 seconds should be ad5 seconds should be spent disturbing the bottom.	
15.		number of organisms needed for a water quality rating after taking of nets allowed, you should run the metrics calculations on your ar data anyway.	
a.	True	b. False	
16. a.	If you find benthic macroinvertebrates that are not part of the VA SOS data sheet, should you include them in the total organism count? Yes b. No		
-			
17.	An unacceptable ecolo	gical score is 0 to 7 .	

An acceptable ecological score is ____9___ to ___12_____.

18.

19.	How many certified monitors must be present at each collection in order for the data submission to be approved?
a.	1
b.	2
c.	3
d.	0
20.	How many times should you monitor annually, and why?

Twice a year (spring and fall), to get an accurate picture of the health of the stream over time.

Appendix D: Quality Assurance Audit Documents

Virginia Save Our Streams Program

Quality Assurance Audit

Date:	
Name(s) and address(es) of volunteer(s) being audited:	
Equipment - check for completeness, cleanliness, and co Were there any problems (circle one, explain in comment missing equipment: Net with poles White sheet Sorting	Monitor's Guide book Magnification Thermometer Calculator
containers Current fieldsheets ID card	Forceps
Methods Please circle any parts of the method that volunteer(s) had Chose the most appropriate riffle Entered downstream of sampling area Anchored net firmly to stream bottom Anchor rocks came from outside of sampling area Anchor rocks were washed prior to use Positioned net to collect maximum flow Collected organisms for specific amount of time Washed rocks and dug into substrates Water did not flow over top of net	d trouble with, then explain in comments: Anchor rocks were washed as removed Net was correctly scooped from stream All organisms were collected from sheet and net Monitor correctly handled unknown specimens Monitor took the proper number of nets Monitor did not exceed the maximum sampling time A habitat assessment was completed
Comments (continue on back if needed): _	
	
Quality Assurance Auditor:_	



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Appendix E: VA SOS Observation of Regional Trainer Form

Virginia Save Our Streams Program

Regional Trainer Observatio	n Form					
Date of Observation:		Date of Train	ning S	Session:		<u> </u>
Name and address of regional	trainer being o	observed:				
Methods Please check the area the region comments section.	onal trainer dic	d not adequate	ly co	ver in the tr	aining session	and explain in th
☐ Introduction of self and pr☐ Background on Monitoring☐ Why monitor?☐ What happens with the da☐ Safety☐ Identification of Macroinv☐ Quality Assurance☐ Collection Methods	g/ watersheds, ta	/pollution		Reference Resources/ Cooperation Establishing	sessment in-stream eve collection (Books/Partne in with decisio g monitoring g	rs n makers
Personal Conduct Please score th Poor, 2 = Fair, 3	3 = Good, 4 = \	/ery Good, 5 =		llent)		
Personal appearance	1	2		3	4	5
Effectively delivered information						
Used appropriate tone and language						
Properly represented						
the views of SOS						

Appendix F: Sign In Sheet

Facilitator Notes:

Registration, Liability Waiver & Photo Release *PLEASE READ THE WAIVER BELOW PRIOR TO SIGNING* Save Our Streams

I acknowledge that I am voluntarily participating in a Save Our Streams training, certification and/or monitoring activity. I understand as a volunteer that I will not be paid for my services, that I will not be covered by any medical or other insurance coverage provided by the Izaak Walton League of America, and that I will not be eligible for any Workers Compensation benefits.

I hereby agree that I, and anyone else claiming through me, will not make a claim against the Izaak Walton League of America, any of its affiliated and partner organizations or contractors, or either of their officers or directors collectively or individually, or the supplier of any materials or equipment that is used for Save Our Streams, or any of the volunteer workers, for the injury or death to me or damage to my property, however caused, arising from my participation in Save Our Streams, including any such claims which allege negligent acts or omissions of the Izaak Walton League of America and/or other above-named parties. This release is intended to be broad in its effect. I hereby agree to accept any and I risks of injury, illness or death in connection with my participation in Save Our Streams. I have carefully read this assumption of risk and general liability release agreement, and I fully understand its contents. I am aware that this is a release of liability and a legal contract between me and the Izaak Walton League of America and/or person(s) rights. I am signing this document of my own free will. I further consent to the unrestricted use by the Izaak Walton League of America and/or person(s) par abo my cor rigi

1		1		
			Signature	rtner organizations or cored for Save Our Streams, rticipation in Save Our Strove-named parties. This rove-named parties. This roparticipation in Save Outents. I am aware that the hts. I am signing this docthorized by them of any potential organizations.
			Print Name	tractors, or either or their or any of the volunteer we reams, including any such or elease is intended to be brour Streams. I have carefull his is a release of liability and cument of my own free will. hotographs, recordings, intended to some the control of th
			E-mail	orthers or directors collective orkers, for the injury or decorders, for the injury or decorders, for the injury or decorders, for the injury or decorders which allege negligers ad in its effect. I hereby agrad in its effect of the injury of the in
			Address	artner organizations or contractors, or either of their officers or directors collectively or individually, or the supplier of any materials or equipment that sed for Save Our Streams, or any of the volunteer workers, for the injury or death to me or damage to my property, however caused, arising from marticipation in Save Our Streams, including any such claims which allege negligent acts or omissions of the Izaak Walton League of America and/or other bove-named parties. This release is intended to be broad in its effect. I hereby agree to accept any and all risks of injury, illness or death in connection with operaticipation in Save Our Streams. I have carefully read this assumption of risk and general liability release agreement, and I fully understand it ontents. I am aware that this is a release of liability and a legal contract between me and the Izaak Walton League of America and that it affects my legights. I am signing this document of my own free will. I further consent to the unrestricted use by the Izaak Walton League of America and/or person(such person) and the Izaak Walton League of America and person in the intensity of the Izaak Walton League of America and members.
			Phone	piler of any material roperty, however can ak Walton League of off injury, illness or do see agreement, and gue of America and Valton League of Arriding of me and/or mediate value of me and/or me and/or me and/or me arriding of me arriving o
			Chapter/Org	is or equipment that aused, arising from many famerica and/or other at the connection will also be ath in connection will also be ath in affects my legible that it affects my legible rerica and/or person will amily members.

Appendix G: Quality Assurance Field Record

Virginia Save Our Streams Program Field Audit Identification Sheet

Date of Sample:	Collector:					
Stream	Station_	County				
LatitudeLongitude_						
Location (please be specific)_						
Date of Identification:		VhoIDed:				
Organism	Number in Sample	Number volunteer found	# MisIDed			
Worms						
Flatworms						
Leeches						
Crayfishes						
Sowbugs						
Scuds						
Stoneflies						
Mayflies						
Dragonflies & Damselflies						
Hellgrammites, Fishflies, & Alderflies						
Common Netspinners						
Most Caddisflies						
Beetles						
Midges						
Black Flies						
Most True Flies						
Gilled Snails						
Lunged Snails						
Clams						
Other						
%Incorrect:						
Identification Check Passed?						



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Appendix H: Unknown Specimen Submittal Form







Unknown Sample Submittal Form

Name and Email Address of	submitting volunteer(s)	
Sample Information:		
Survey Date:	Station ID:	
County/State:		
Latitude:	Longit	ude:
Location (be specific):		
Please describe the physica movements):	al characteristics of this organ	nism (including any identifiable
Do you have any thoughts o	on what this organism might b	pe?
If you would like to send the organism to assist with ide the information below in preservation jar or vial.	ntification, please fill out	Izaak Walton League of America ATTN: VA SOS Coordinator 707 Conservation Lane Gaithersburg, MD 20878
Date Collected:	Submit	tter Name:
County/State:	Station	n ID:
Latitude:	Longit	ude:
Location (please be specific	.).	

Appendix I: Virginia Save Our Streams Safety Recommendations

VASOS Safety Recommendations

- Monitoring sites should be conducted in wadeable sections of streams. The depth of the stream should be no deeper than 3 feet (the height of the net).
- If high waters are present at the site, this should be noted on the front page of the field sheet and the site should not be monitored at that time.
- Always monitor in at least pairs.
- Never allow children (16 or younger) to go to the stream alone. When monitoring with children, stress that they should not come back to the stream without an adult present.
- All kits should contain some sort of waterless hand sanitizer and/or peroxide. These should be used frequently, especially before touching face or eyes and before eating.
- Be careful of glass. If a site has known glass, use a garden rake to dig up substrates and consider purchasing neoprene gloves to help protect hands. Should a volunteer get cut, they should clean the cut immediately.
- Be sure to have plenty of water and sunscreen in the summer, and wear plenty of clothing in the winter. In the winter, consider purchasing neoprene gloves to help keep hands warm, and bring plenty of towels to stay dry.

Appendix J: Recommended Sampling Seasons for Virginia Save Our Streams

Recommended Sampling Seasons for Virginia Save Our Streams

The Virginia Save Our Streams program recommends monitoring two times a year, once in the spring and once in the fall. While volunteers may go during any time of the season, recommended times are in bold in the below table.

Winter	Spring	Summer	Fall
	March, April, May		September, October,
			November

Appendix K: Macroinvertebrate Identification Card

Also available for download at <u>www.vasos.org</u>

Stream Insects and Crustaceans ID Card

Lines under picture indicate the relative size of organisms



Aquatic Worm: Class Oligocheata

1" - 2", can be very tiny; thin, wormlike body, tolerant of impairment



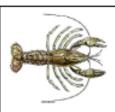
Flat Worm: Family Planaridae

Up to $\frac{1}{4}$ ", soft body, may have distinct head with eyespots, tolerant of impairment



Leech:

Order Hirudinea ½" - 2", segmented body, suction cups on both ends, tolerant of impairment



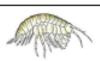
Crayfish: Order Decapoda

Up to 6", 2 large claws, 8 legs, resembles a small lobster, somewhat tolerant of impairment



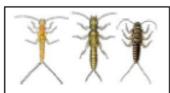
Sowbug: Order Isopoda

‡" - ‡", gray oblong body wider than it is high, more than 6 legs, long antennas, somewhat tolerant of impairment



Scud: Order Amphipoda

‡", white to gray, body higher than it is wide, swims sideways, more than 6 legs, resembles small shrimp, somewhat tolerant of impairment



Stonefly: Order Plecoptera

 $\frac{1}{2}$ " - $1\frac{1}{2}$ ", 6 legs with hooked tips, antennae, 2 hair-like tails, no gills on abdomen, very intolerant of impairment



Mayfly: Order Emphemeroptera

½" - 1", plate-like or feathery gills on abdomen, 6 hooked legs, 2 or 3 long hair-like tails, tails may be webbed together, very intolerant of impairment



Beetles: Order Coleoptera

\$\frac{1}{4}" - 1", disk-like oval body with 6 small legs and gill tufts on underside OR small black beetle crowling on streambed OR comma-like brown "crunchy" body with 6 legs on upper 1/3 and possibly gill tuft on back end, OR (miscellaneous body form - rare), somewhat tolerant of impairment



Hellgrammite, Fishfly, and Alderfly: Order Megaloptera

4" - 4", 6 legs, large pinching jaws, 8 pairs of feelers along abdomen, 2 hooks on tail end OR 1 single spiky tail, somewhat tolerant of impairment



Common Netspinners: Family Hydropsychidae

Up to ‡", 6 hooked legs on upper 1/3 of body, 2 hooks at back end, underside of abdomen with white tufts of gills, somewhat tolerant of impairment



Most Caddisfly: Order Trichoptera

Order Trichoptera

Up to 1", 6 hooked legs on upper 1/3 of body, may be in stick, rock or leaf case, no gill tufts on abdomen, intolerant of impairment

Illustrations from: Voshell, J. R., Jr. 2001. Guide to the Common Freshwater Invertebrates of North America. MacDonald and Woodward Publishing Co. With permission of the author.

Stream Insects and Crustaceans ID Card

Lines under picture indicate the relative size of organisms



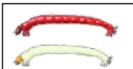
Dragonfly and Damselfly: Order Odonata

🗦 " - 2", large eyes, 6 hooked legs, large protracting lower jaw, 3 broad oar-shaped tails OR wide oval to round abdomen, somewhat tolerant of impairment



Family Gomphidae

🖁 " - 2", large eyes, 6 hooked legs, large protracting FLAT lower jaw, wide oval to round abdomen, short stubby antennae that are parallel to each other, intolerant of impairment



Midges:

Family Chironomidae

Up to \$10, distinct head, worm-like segmented body, 2 leg-like projections on each side, often whitish to clear, occasionally bright red, tolerant of impairment



Black Fly: Family Simuliidae

Up to ‡", and of body wider (like bowling pin), distinctive head, sucker on end, tolerant of impairment



Most True Flies: Order Diptera

1" - 2", bodies plump and maggetlike, may have caterpillar like "legs" along body, may have lobes or conical tails on end, tolerant of impairment



Gilled Snails: Class Gastropoda

Up to ‡", shall opening covered by a thin plate called an operculum, with helix pointed up shell opens to the right, intolerant of impairment



Lunged Snails: Class Gastropoda

Up to ₹", no operculum, with helix pointed up shall opens to the left, tolerant of impairment



Cloms:

Class Bivalvia Up to ₹", fleshy body

enclosed between two clamped together shells (if clam is alive, shells cannot be pried apart without harming clam), somewhat tolerant of impairment





Tails: There are many different kinds of macroinvertebrate tails. The thin threadlike tails found on stoneflies and mayflies are called cerci. The oar-shaped tails found on a damselfly are not really tails - they are actually gills called caudal lamellae!



VA Save Our Streams Program

VA Division of the Izaak Walton League of America P.O. Box 8297 Richmond, VA 23226 (804) 615-5036 www.vasos.org These sheets are modified from the National Izaak Walton League of America SOS Program Stream Insects & Crustaceans ID Card.

http://www.iwla.org/SOS/index.html

Illustrations from: Voshell, J. R., Jr. 2001. Guide to the Common Freshwater Invertebrates of North America. MacDonald and Woodward Publishing Co. With permission of the author.

Appendix L: Reference Materials for Volunteer Monitors

Reference Materials

- Barbour, M.T., J. Gerritsen, and B. Synder. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish, 2nd edition. EPA 841-B-99-002 Office of Water, Washington, D.C.
- Engel, S.R. 2000. The effectiveness of using volunteers for biological monitoring of streams. Masters Thesis, Department of Entomology, Virginia Polytechnic Institute and State University.
- Kellogg, L. 1994. Monitor's guide to aquatic macroinvertebrates. The Izaak Walton League of America, Gaithersburg, Maryland.
- United States Environmental Protection Agency. 1997. Volunteer stream monitoring: A methods manual. EPA 841-B-97-003 Office of Water, Washington, D.C.
- Voshell, J. Reese. 2002. A guide to common freshwater invertebrates of North America. Illustrated by Amy Bartlett Wright. The McDonald & Woodward Publishing Company.

 Blacksburg, Virginia.

Appendix M: Virginia Save Our Streams Site Selection Guide

Selecting a Monitoring Location

Selecting representative sites is one of the most important elements in designing a monitoring program. Before selecting monitoring sites, you should determine two things: where and what kind of monitoring is already being done in your watershed and what question would you like your monitoring to answer. The answers to both of these questions will help you map out the most effective monitoring locations.

Site locations will depend on the goal of your monitoring program. If you want to know what the water quality is of a particular stream, you might select a site close to the mouth of the stream. If you want to know the water quality at a particular fishing spot, you might want to select a site within that fishing spot. If you want to know if a development is impacting a stream you might want to have one site upstream of the development and one site downstream of the development. If you want to collect data to assist the state in developing water quality assessment reports, you might want to select a site within a watershed that is not currently monitored.

Virginia Save Our Streams can help you locate your sites by:

- determining which streams are currently monitored in your watershed
- finding out the natural resource questions professionals would like to have answered in your watershed
- providing a map with natural resource characteristics to assist in developing a monitoring plan
- making a site visit to potential monitoring sites to evaluate access and habitat

Your monitoring site should have good access and you should always get landowner permission (unless in a public right of way).

Defining Monitoring Stations

Monitoring should be done at one station, defined as a single stretch of stream not more than 100 yards long. If you wish to assess a longer section of a stream, select two monitoring stations at the top and bottom of the stretch, or multiple sites along the length of the stretch at quarter-mile or greater intervals. Be sure to revisit the same station each time so that your results will be comparable. Carefully record the location of your monitoring station on your VA SOS Stream Survey form. If you do not know the latitude and longitude coordinates when you monitor, use an accurate description of the site (i.e. Site located on north side of route 660, 1 mile east of route 607) that enables you or another monitor to return to the same location. The regional coordinator or VA SOS staff will help you identify the coordinates at a later date.

Select a riffle typical of the stream, that is, a shallow, fast-moving area with a depth of 3 to 12 inches (8 to 30 cm) and stones which are cobble-sized (2 to 12 inches) or larger. Stone size is important since the macroinvertebrates surveyed prefer these stones for protection and food supply. In addition, the bubbling of the water over the rocks provides needed oxygen for healthy growth.

Documenting Monitoring Stations

Stations should be properly documented by including the stream name, county, and location. The location should be specific and should allow someone to find the property using Google Maps. For instance the site location could be: East side of route 630 bridge, 2 miles north of route 29. This location is easy to find for anyone using Google Maps.

The following is a poor example of location: at northwest corner of Mr. Earl's property. Unless you know Mr. Earl, you will not be able to find the site! Include latitude and longitude if possible. If you have more than one site on a stream, identify the sites with a station number and always use the same station number for a site! If you cannot remember site number, consider using a descriptive name for the site such us "downstream", "upstream", or "route11".

Appendix N: 2006 Validation Studies

Comparison of Virginia Save Our Streams and Virginia Stream Condition Index Scores in Streams of the Eastern Piedmont of Virginia

Andrew L. Garey and Leonard A. Smock Department of Biology
Virginia Commonwealth University Richmond, Virginia
February 2007

Executive Summary

The objective of this study was to determine if the results of stream macroinvertebrate assessments conducted by amateur volunteer monitors were appropriate for use by the Virginia Department of Environmental Quality (DEQ) in its 303 (d)/305 (b) integrated report. Rapid biological assessments of 20 wadeable stream sites in the eastern part of Virginia's Piedmont Physiographic region were conducted. The macroinvertebrate communities at the study sites were sampled and assessed using two separate protocols; the protocol of Virginia Save Our Streams (SOS), a volunteer monitoring group, and the protocol currently employed by Virginia Department of Environmental Quality (DEQ) biologists. The latter, which produces Stream Condition Index (SCI) scores, is based on EPA Rapid Bioassessment Protocols for highgradient streams (Plafkin et al. 1989, Barbour et al. 1999) and the Virginia Stream Condition Index report (Burton and Gerristen 2003). Pearson product-moment correlation analysis indicated a weak (r2= 0.24) but statistically significant (p < 0.05) correlation between SOS and SCI scores. The qualitative ratings derived from the two scoring systems were in agreement at 11 out of 16 (69%) of the study sites. A chi-square goodness of fit test indicated that the proportion of sites receiving acceptable ratings was significantly different (p < 0.001) between SOS and SCI scores. The SOS system employs a zone of uncertainty, or "grey zone," where no final judgment of ecological condition is made. Additional correlation models were constructed to determine the effect of excluding grey zone sites on the strength of the correlation between SOS and SCI scores. In these additional analyses, the range of values considered to be grey zone SOS scores was varied in an attempt to reduce variability in the data set and thus to strengthen the correlation. The correlation between SOS and SCI scores was maximized (r2 = 0.75, p < 0.05) when a grey zone of 6-8 was employed, where all sites receiving SOS scores of 6, 7 or 8 were excluded from the correlation analysis. This increased grey zone, however caused an increase in the proportion of sites where SOS and SCI ratings were in disagreement. Identifications of macroinvertebrates in the field by SOS personnel were determined to be generally accurate based on a re-analysis of the samples by VCU personnel. The effect of the few incorrect identifications on the results of the SOS scoring was minimal. The results and conclusions of this study were limited by the low number of sites sampled that were categorized as being of good to excellent quality according to the SCI. In addition, the total number of sites sampled (20) was relatively low for investigations of this type. A larger sample set of eastern Piedmont streams that reflect a wider range of ecological conditions would be helpful in making a more complete evaluation of the usefulness of SOS volunteer monitoring data in DEQ water quality monitoring projects.

Validation of the Modified Virginia Save-Our-Streams Protocol

J. Reese Voshell, Jr. Stephen W. Hiner

Department of Entomology Virginia Tech Blacksburg, VA 24061 August 1, 2006

Summary and Recommendations

The modified SOS protocol that was developed by Engel and Voshell (2002) does not need to be changed in regard to sampling, identification, enumeration, and calculation of the multimetric index called the Virginia Save-Our-Streams Index (VSOSI). The volunteers made very few mistakes in the identification of macroinvertebrates. These mistakes were considered minor and would not produce any substantive difference in the VSOSI calculation, certainly not a difference in the ecological condition classification. The VSOSI correlates very strongly with the Virginia Stream Condition Index (VSCI) used by professional biologists at the Virginia Department of Environmental Quality. However, in this validation study the VSOSI did not agree satisfactorily with the classification of stream ecological condition done by professional biologists using the VSCI. The VSOSI overrated too many streams (i.e., classified them as acceptable, when the VSCI classified them as impaired). A simple solution to this situation was found: raise the numerical value required for the VSOSI to classify a stream as acceptable. Using a cutoff of 9 for a stream to be classified as acceptable by the VSOSI agreed very closely (81%) with the VSCI classification of the same streams. In addition, the disagreement of site classification was equally split between classifying reference as unacceptable and classifying impaired as acceptable. We recommend that Virginia Save-Our-Streams continue to use the existing protocol as modified by Engel and Voshell (2002) and to calculate the same VSOSI, but to shift the criterion for acceptable ecological condition to 9. If an uncertain ("gray zone") is desired for the VSOSI to be comparable to recently suggested modifications of the VSCI, then we recommend that the gray zone be the VSOSI unit score of 8. Classification of the ecological condition of streams by the VSOSI with a gray zone of 8 agreed very well with the VSCI with a gray zone of 55-63. With or without the gray zone, all data collected since the modification by Engel and Voshell (2002) are still valid. The ecological condition classifications merely need to be reassigned based on an acceptable cutoff of 9 and possibly a gray zone of 8 in order to be in agreement with the VSCI classification of reference conditions. The results of the current validation study are not unexpected because the VSCI was not available at the time of the previous study. Lastly, we recommend that Virginia Save-Our-Streams periodically revalidate the performance of the VSOSI against the VSCI because VDEQ is still analyzing and validating the VSCI.

Appendix O: Biological Monitoring Protocol for Rocky Bottom Sampling





Biological Monitoring Instructions for VA SOS Stream Monitors

Surveying stream macroinvertebrates provides information about the health of your stream. Many stream-dwelling organisms are sensitive to changes in water quality. Their presence or absence can serve as an indicator of environmental conditions.

Before selecting a site to monitor, please follow these rules:

- Check with state and county agencies to make sure you are not disturbing a survey area used by government agencies (over-monitoring may harm the stream).
- Contact local landowners before monitoring to make sure you are not trespassing.
- · Ask for permission if you need to cross private land. Most landowners will give permission for your study and may even want to help you conduct your survey.

Monitoring should be conducted at the same station (location) each time you sample during the year. If you want to monitor several stations on your stream, make sure the stations are no closer than one-quarter mile. This means, for example, that if you want to monitor a one-mile segment of a stream, you can have a maximum of four monitoring locations. If the stations are spaced more closely, the monitoring activity may become the main impact on water

Carefully record the location of your monitoring station on your Biological Monitoring Data Form. Include roads, bridges, and significant landmarks. Use your smart phone's GPS functionality to determine your longitude and latitude.

THINGS TO CONSIDER

If you are monitoring more than one station, begin monitoring downstream and move upstream. This will prevent macroinvertebrates disturbed by the first test from washing downstream and being captured in your net a second time. Each survey should record only the organisms present at that particular location and time.

Monitoring should be conducted two times per year at each station, in spring and fall. This monitoring will accurately record the yearly life cycle in the stream. Less frequent monitoring, while still useful, will not give the complete picture of stream life.

When scheduling monitoring events, remember that excessive monitoring can become a major threat to stream health because each monitoring event disturbs the streambed and dislodges macroinvertebrates. In general, monitoring stations should have two months to recover from a monitoring event. It is crucial to the integrity of your data that you do not over-monitor your stations. There is some flexibility in this rule.

For example, if an oil spill occurs, you might want to monitor your stream, even if you have done your two surveys for the year. The data you collect might be the only data available on the immediate impacts of the spill.

The methods described in these instructions are for use in wadable streams. To be wadable, the water level in the stream must not exceed the height of your knees. When planning monitoring sessions for younger people, please keep in mind that knee height varies greatly between adults and children.

Safety is critical when monitoring a stream. Do not enter a stream if the water is flowing abnormally fast or high, if the banks are steep or unstable, or during a thunderstorm. If the water smells of raw sewage, do not enter the water; contact state environmental authorities immediately. Monitors in urban-area streams should wear gloves to protect against glass or metal that may be buried in the streambed. Finally, always sanitize your hands and equipment after each monitoring session to avoid bacterial infection.

There are two sampling methods available to collect aquatic macroinvertebrates. Muddy Bottom Sampling is used in streams that do not have riffles, a streambed feature with cobble-sized stones between 2 to 10 inches in diameter where the water bubbles over the rocks. If your stream has riffles, please refer to the Rocky Bottom Sampling section.

MUDDY BOTTOM SAMPLING

The Muddy Bottom Sampling method is intended for volunteers sampling streams that primarily do not have rocky bottoms or riffles. Muddy bottom streams are composed of muddy or sandy substrate, overhanging bank vegetation, and submerged woody and organic debris. This method enables sampling of streams where kick-seining techniques do not yield the best representative sample of macroinvertebrates or allow easy collection from the most productive aquatic

Monitoring is conducted using an aquatic D-frame or dip net with 500 micron mesh and a four-foot pole. The dip net is used to sample a wide variety of habitats and collect many different kinds of organisms.

Before you begin monitoring, familiarize yourself with the four main habitats that can exist along muddy bottom streams: woody snags, stream banks, riffles, and submerged aquatic vegetation. Search for these habitats along a 100-meter section upstream from the monitoring station.

Following are simple descriptions of the habitat types and collection techniques for each habitat.

Woody snags

Snags, or submerged woody debris, are areas where tree trunks or limbs have fallen into the stream. Leaves and debris may be collected or tangled in the snag. To sample woody debris, jab the medium-sized submerged material (sticks and branches), scrape along the submerged surface of large material (logs), or pick up and rub woody debris in the net by hand.

Stream banks

Stream banks are the edge of the stream. These may be vegetated, bare soil, undercut, or eroded. Stream banks are sampled in a bottom-to-surface motion, jabbing at the bank to loosen organisms. Each scoop of the net should cover one foot of submerged area.

Riffles

Riffles are shallow, fast-moving areas of water flowing over cobble-sized stones and rocks. To sample a riffle, place the net firmly along the bottom of the stream and use your hands or foot to rub around the cobbles.

Submerged aquatic vegetation

Submerged aquatic vegetation includes any plant growing under or out of the water of the stream. In deep water, plants are sampled by drawing the net through the vegetation from the bottom to the surface of the water. In shallow water, plants are sampling by bumping the net along the bottom of the bed of vegetation.

A single sample of macroinvertebrates consists of collecting 20 "jabs" in productive habitats. A single "jab" consists of aggressively thrusting the net into the target habitat for approximately one meter. This initial jab is then followed by two to three sweeps in the water of the same area to collect dislodged organisms. The sample is then transferred to the sieve bucket or seining device, by banging the net over the bucket opening or by inverting the net into a partially submerged bucket. Transfer sample contents to the sieve bucket after every jab.

Each habitat should be sampled in proportion to its abundance in the stream sample area. For example, if 50 percent of a sample area is woody debris, it should be sampled with ten jabs.

Thoroughly mix the sample in the sieve bucket by swishing it around in shallow water, being careful to keep the entire sample inside. Empty the contents of the bucket onto a flat,

MUDDY BOTTOM SAMPLING EQUIPMENT

- Biological Monitoring Data Form for Muddy Bottom Streams
- . One D-frame aquatic dip net with mesh of 500 microns
- · Portable table
- · White sheet or table cover
- . One screen-bottom bucket with a mesh of 1/32 inches
- "Field Guide to Aquatic Macroinvertebrates"
- · Aquatic thermometer
- · Magnifying glass
- · Small magnifier boxes (optional)
- · Spray bottle
- · Ice cube trays or specimen jars for sorting organisms
- · Tweezers or forceps
- · Clipboard
- · Boot-footed waders or waterproof knee boots
- Neoprene gloves, hand, elbow or shoulder length (optional)
- · Additional identification resources

light colored surface, such as a white sheet or table. Spread the sample evenly across a square portion of the surface, such that the sample material is not clumped together. Using a stick, divide the sample into a grid with four equal quadrants. Randomly select a quadrant to start sorting and identification.

Using tweezers or your fingers, separate all the organisms from the surface and place them in your collecting container. Plastic ice cube trays filled with stream water are helpful when sorting samples. Sort organisms into similar groups as you separate your sample. Be sure to regularly wet the surface using a spray bottle, as the organisms will begin to dry out. See the "Identification" section for details on identifying the organisms in your sample.

Record the number of individuals you find in each taxonomic group on the tally sheet. Metric calculations should be based on a sample size of at least 100 organisms. Count the number of scuds found in your sample, but do not count them towards the 100 required organisms (in other words, you need at least 100 non-scud organisms for your sample).

If the first grid doesn't yield 100 organisms, move on to a second grid and sort it in its entirety. Record the number of individuals in each taxonomic group on the tally sheet for the second grid. If you do not have 100 organisms after you have picked the second grid, continue on to the third. Continue

sorting grids in their entirety until you have at least 100 organisms or you have sorted the entire sample.

ROCKY BOTTOM SAMPLING

The Rocky Bottom Sampling method is intended for volunteers sampling streams that have rocky bottoms or riffles. A kick-seine net – a finely meshed net with supporting poles on each side – is the best tool to use for collecting macroinvertebrates in rocky bottom streams. The VA SOS Rocky Bottom Sampling method recommends using a kick-seine net with 1/32-inch mesh. The 1/32-inch mesh net will provide you with a large sample because it captures younger, and therefore smaller, organisms of each species, and some state and local government agencies require use of the 1/32-inch mesh.

Select a riffle that is a shallow, fast-moving area of water with a depth of 3 to 12 inches and cobble-sized stones (2 to 10 inches) or larger. Before entering the stream, record observations about riffle composition on the back of the Biological Monitoring Data Form.

Place the kick-seine net at the downstream edge of the riffle. The net should be secured with rocks selected from outside the sample area. Rub the rocks to dislodge any macroinvertebrates outside of the sample area before placing on the bottom of the net, or use dry rocks from outside the stream. Don't allow any water to flow over the top of the net either — organisms can escape over the net. Also, if water is flowing over the top of the net, the water level is too high for safe monitoring.

Monitor a one-foot by one-foot area of the streambed directly in front of the net.

The sample site can be sampled up to four times in order to yield a total of 200 or more macroinvertebrates. It is important to have at least 200 invertebrates by the end of the sampling session.

The length of each sampling period can be adjusted depending on the number of macroinvertebrates found in each sampling period. Each sampling period must be between 20 and 90 seconds. For example, if 100 macroinvertebrates are found during one 30 second sampling period, you will likely only need to monitor for a second 30 second period. Do not do another sampling period once you have reached 200 organisms, if you have already sampled four times, or for longer than 90 seconds.

If you sample the maximum number of seconds for at least three nets and do not reach 200 organisms, you should still record your results and calculate the stream health score.

Once you have determined the length of the sampling period, calculate the amount of time you will spend rubbing rocks versus disturbing the substrate. You should spend 75% of the sampling period rubbing rocks, and the remaining

ROCKY BOTTOM SAMPLING EQUIPMENT

- Biological Monitoring Data Form for Rocky Bottom Method
- · Kick-seine with 1/32-inch mesh
- · Net poles
- Portable table
- · White sheet or table cover
- · "Field Guide to Aquatic Macroinvertebrates"
- · Aquatic thermometer
- · Magnifying glass
- · Small magnifier boxes (optional)
- · Spray bottle
- · Ice cube trays or specimen jars for sorting organisms
- · Tweezers or forceps
- Clipboard
- · Boot-footed waders or waterproof knee boots
- Neoprene gloves, hand, elbow or shoulder length (optional)
- Additional identification resources

25% disturbing the substrate. For example, in a 30 second sampling period you will spend 22.5 seconds rubbing rocks and 7.5 seconds disturbing substrate.

Firmly and thoroughly rub your hands over individual cobbles within the sampling area, placing each rock outside of the sampling area when finished. Once you have reached 75% of the sampling period, disturb the sample substrate using a dry rock or garden tool. At the end of the sampling period, stop disturbing the substrate and let the water run clear.

Before removing the net, rub any rocks that you used to anchor the net to the stream bottom and remove the rocks from the bottom. Firmly grab the bottom of the net so that your sample does not fall from the net, and then remove it from the water with a forward-scooping motion. This will allow you to remove the net without allowing any insects to be washed under or off it.

Placing a white trash bag or white sheet under the net before separating the sample will catch any tiny organisms that may crawl through the net. Use a watering can or spray bottle to periodically water your net. The organisms will stop moving as the net dries out. Occasionally wetting the net will cause the organisms to move, making them easier to spot. Watering the net is especially important on hot, dry days.

Place the net on a flat, bright area, out of direct sunlight. Using tweezers or your fingers, separate all the organisms from the net and place them in your collecting container, which should be full of water from the stream. Sort organisms into similar groups as you separate your sample. This will make your identification quicker when you are ready to record results. Plastic ice cube trays are helpful when sorting the catch. For example, put all organisms with legs in one section and all organisms with no legs in another section. Any organism that moves, even if it looks like a worm, is part of the sample. Look closely, since most aquatic macroinvertebrates are only a fraction of an inch long.

IDENTIFICATION

Once organisms are collected through either the Rocky Bottom or Muddy Bottom Sampling methods, they are sorted and identified. You can use IWLA's "Field Guide to Aquatic Macroinvertebrates" or A Guide to Aquatic Insects and Crustaceans, both of which can be purchased through links on the Save Our Streams equipment page on the League's website: iwla.org/sos. The League's free Aqua Bugs app provides easy-to-follow instructions to help you identify your macroinvertebrates. Search for it in the Apple Store and Google Play Store.

Izaak Walton League macroinvertebrate guides provide a general overview of the macroinvertebrate types found across the United States. The composition of macroinvertebrate populations varies depending on local geography and geology. Try contacting your local environmental protection agency or universities for more information about local macroinvertebrates. Local experts might be able to share additional field guides that are specifically designed for your area.

Not all organisms in your stream are listed in the guides. For instance, macroinvertebrates such as whirligig beetles, water striders, and predaceous diving beetles are not included on the survey sheet. They are surface breathers and do not provide any indication of water quality.

When beginning your identification, ask yourself the following questions:

- · How large is the organism?
- . Is the body long and slender, round, or curved?
- · Does the organism have any tails? How many?
- Does the organism have any antennae?
- · Does the organism have legs? How many? Where?
- Is the body smooth and all one section, or is it segmented (two or more distinct sections)?
- Does the organism have any gills (fluffy or plate-like appendages)?

- Where are the gills located? Sides, back, underside, under its legs?
- . Does it have pinching jaws like a beetle larvae?
- Are any legs or antennae missing because they were broken off in the net?
- What color is the organism?
- Does the organism swim underwater or remain on the surface?

When using the macroinvertebrate guides, read the descriptions for each organism. Sizes are provided for reference. However, if you catch a young macroinvertebrate that has just hatched and has not yet reached full size, it may be smaller than indicated in the guides. Specimens can be put into magnifying boxes to ease identification. Return the organisms to the stream after sampling is completed.

METRICS

During identification of macroinvertebrates, record your results on the macroinvertebrate chart. Once you have counted all collected organisms, start calculating the Individual Metrics. Each Individual Metric is a percentage of various macroinvertebrate groups. Tally each indicated organism group and calculate the percentage to determine the Individual Metrics.

Use each Individual Metric to calculate the Multimetric Index Score (stream health score). Write each metric value from the Individual Metrics into the corresponding box under Your Metric Value. Determine the score based on the range for each metric value and indicate which score each Metric Value falls under. Follow the multiplication steps at the bottom of the table to determine your Save Our Streams Multimetric Index Score and determine whether the site has acceptable or unacceptable ecological conditions.

BIOLOGICAL MONITORING DATA FORM QUESTIONS

The Biological Monitoring Data Form also includes questions about the land and vegetation surrounding the stream. These questions help characterize the quality of stream habitat and its ability to support a healthy population of stream organisms. The land use information also paints a picture of the stream for other people who might review your data. Guidelines for correctly answering these questions are given below. Record the answers based on the area that is upstream from your monitoring site; generally, you should record the data for the area you can see. For land use information, include uses for one mile upstream from your site or the section of stream you have adopted. If necessary, take a walk or consult a map for this information.

Fish water quality indicators: Different fish have different tolerances to pollution. The type of fish present may indicate the type of water quality expected. If you collect fish but don't recognize the type, write a description of the fish on the data form or take a picture to use for later reference. You can find fish identification charts or experts to help with fish identification at local schools, agencies, libraries, or online.

Barriers to fish movement: The absence of certain fish types may be due to a dam or other large obstacle, not because of water quality. Note on your survey form if the dam is upstream or downstream from your monitoring site and how far away. Waterfalls should only be recorded if they are large enough that a fish could not reasonably jump over them or swim around them. Usually, waterfalls of a few feet or less are not impediments to the upstream movement of fish.

Surface water appearance: You may check more than one of the colors listed but not all of them. Note if strange colors are present throughout the stream or only in one section, such as immediately below a discharge pipe or highway culvert.

Streambed deposit (bottom): Record the over-all appearance of the stream bottom. If the streambed does not have any apparent coating, you may note it as "other" and write in "normal."

Odor: Note any unusual odors. Odors may come from natural processes or may indicate potential water quality problems.

Stability of streambed: An unstable streambed can mean that soil is eroding from the bottom of the stream and may indicate water quality problems. When standing in the stream, determine how frequently the bed sinks beneath your feet.

Algae appearance: Algae feels slimy. You will notice it as you rub rocks during monitoring. A great deal of algae may indicate too many nutrients in the water. Sometimes more algae will appear in the spring after snowmelt releases extra nutrients into the stream. However, take note of the percent and type of algae present in the stream to make sure it is not increasing over time.

Algae located: Estimate the percentage of stream bed that is covered by algae. Algae is often present in small quantities in healthy streams. Excess algae may indicate water quality problems.

Stream channel shade: Over the course of the day, estimate what percentage of the stream channel is shaded by stream-side trees, shrubs, and grasses. Shading helps keep water cool and can be beneficial for aquatic life.

Streambank composition: Remember to look at both sides of the stream's banks. When questions ask for a percentage, use the information for both the left and right bank and combine values. For instance, if one side of the bank is completely bare due to erosion while the other side is well vegetated, you should record the percent of bank coverage as 50 percent.

When recording total percentages of shrubs, grasses, and trees, you should also look at both sides of the bank. However, if one side has artificial structures such as rock riprap or concrete, you will have to account for such ground cover. For instance, if the left side of the bank is not vegetated, you cannot have more than 50 percent of shrubs, grasses, and trees total when those values are added together.

Streambank erosion: Again, look at both sides of the bank to determine the percentage of soil erosion.

Riffle composition: This question refers to the 3x3-foot area of the stream sampled for Rocky Bottom Sampling techniques with a kick-seine net. Do not fill out this question when using the muddy bottom sampling technique.

If you used a kick-seine to conduct the Rocky Bottom Sampling method, answer this question before you disturb the site. The organisms you collect are most abundant in riffles composed of predominantly cobble-sized stones (more than 70 percent cobbles is a good riffle habitat). Start with the largest rocks first when recording bed composition. If you don't have any boulders (rocks larger than 10 inches), record cobble-sized stones and continue until your percentages equal 100 percent. A typical riffle in a medium-gradient stream might be recorded as 5 percent boulders, 65 percent cobbles, 15 percent gravel, 10 percent sand, and 5 percent silt. Ranges are given on the survey form for the rock sizes. For the smaller rock sizes, remember that silt feels like talcum powder and sand feels gritty. If your riffle had 40 percent silt, 10 percent gravel, and no cobbles, you should either find another station to monitor or switch to the Muddy Bottom Sampling method.

Land uses in the watershed: The survey form asks if land use impacts within a one-mile radius of your sampling site are high (H), moderate (M), slight (S), or none (N). Although these questions are somewhat subjective, determining the impact is easy and straightforward.

- Note "H" for a land use if it:
 - Comprises the majority of land in the watershed and is polluting the stream, such as a stream traveling through land that is being strip mined for coal.

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- Has a severe impact on stream quality even though the land use does not utilize a great deal of land, such as a construction site that has caused the stream to be full of silt.
- Note "M" if the land use is definitely contributing to stream degradation, but is not the major cause for degradation (or is one of many causes). For example, parking lot runoff and trash from a shopping mall may contribute significantly to stream pollution, but they may not be the only causes of stream degradation.
- Note "S" for a land use if its impacts only slightly pollute the stream. For example, although a farm may be present, good farming practices and conservation measures may mean the pollution impact is negligible.
- . Note "N" if the land use is present but causing no pollution.
- . If the land use is not present, do not write anything.

Take the time to drive or walk through your watershed before filling out this section to determine if these land uses are present and impacting the stream.

When considering land use as the controlling factor in stream quality, look not just at the area visible from the stream but at all the land draining into the stream – the watershed. If the stream collects water from an intensely developed or agricultural area, do not be surprised if no organisms are found. Should this be the case, consider visiting a forested stream of the same size in the same

watershed for sampling comparison. You might be surprised by the different types of organisms you find.

You can identify a pollution source by sampling the stream at quarter-mile intervals upstream from the initial sampling point (where a pollution impact is suspected) until quality improves. The pollution sources should be identified somewhere between the point where degraded conditions were first found and the point where water quality improves.

Comments: Use this space to record observations that are not noted elsewhere on the data form. This may include current and potential future threats to the stream's health.

STREAM PROBLEMS AND THEIR EFFECTS ON STREAM ORGANISMS

- Physical Problems may include excessive sediment from erosion, street runoff, or discharge pipes. Sediment can create poor riffle characteristics, contribute to excessive flooding, reduce flow, change water temperature, and smother aquatic life. The result is usually a reduction in the number of macroinvertebrates in the study area.
- Organic Pollution is from excessive human or livestock wastes or high nutrient enrichment from farm or yard runoff.
 The result is usually a reduction in the diversity of insects.
- Toxic Pollution includes chemical pollutants such as chlorine, acids, metals, pesticides, and oil. The result is usually a reduction in the number of insects.

Appendix P: Stations Table*

Appendix F. S									
Station ID	Latitude	Longitu de	City or County	Water Body Name	Sample Site Descripti on	Collecting Organizat ion	Monitori ng Purpos e	Monito ring Frequ ency	Parameters Sampled at this Location
R9-BCC-02	36.9536 85	- 82.0544 8	Russell	Big Cedar Creek	In Pinnacle Natural Area Preserve at the end of State Park Rd	Clinch Water Watch	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
R9-CR-01	36.9152 76	- 82.0137	Russell	Clinch River	Off Poor Farm Road West of where it hits U.S. Hwy 19	Clinch Water Watch	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
R9-CR-02	36.9698 38	- 82.0137 77	Russell	Clinch River	1400 ft north of where Shepard Hollow Rd hits Chestnut Rd	Clinch Water Watch	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
S4-SFHR-01	36.7592 829	- 81.5384 49	Smyth	South Fork Holston River	Stream at Buller Fish Hatchery and Aquatics Center	Holston Rivers Virginia Master Naturalist chapter	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature

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					In the Campbell Avenue section of the Marion		General Stream Health		
54-MFHR-01	36.8382 6	- 81.5117 4	Smyth	Middle Fork Holston River	Riverwal k, upstream of the Main street bridge and between Campbell Avenue and Brunswic k Lane.	Holston Rivers Chapter Virginia Master Naturalist s	Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
G5-UTFC-001	36.6653	- 81.3810 4	Grayson	Unname d Tributar y of Fox Creek	In the hairpin turn of Flat Ridge Rd, near where it intersect s Rockbrid ge Rd	Preserve Grayson	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
	36.6125	- 81.3236		Unname d Tributar y of the New	At the end of Grassy	Preserve	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
G5-UTNR-001	36.7289	- 81.2607	Grayson	North Branch of Elk Creek	Where the stream crosses Laurelvie w Rd near Comers Rock Rd	Preserve Grayson	on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
G5-NBEC-01	36.7231	-	Grayson	North	North	Preserve	General	Twice	Benthic

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	4	81.2470		Branch of Elk Creek	Branch of Elk Creek, Armistea d property.	Grayson	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Per Year	macroinvert ebrates, temperature
G5-GC-001	36.6951 1	- 81.2455 4	Grayson	Goose Creek	250 feet east of the intersecti on of Sweetwa ter Rd and Big Ridge Rd	Preserve Grayson	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
G5-EC-01	36.7158	- 81.2431 2	Grayson	Elk Creek	1 mile downstre am from Christma s tree farm	Preserve Grayson	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
	36.7275	-		Comers Rock Branch of Elk	Across 611 from 3076 Caty	Preserve	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
G5-CRBEK-OO1 PBCG5.001	36.6792 07	- 81.2197 88	Grayson Grayson	Peachb ottom	Sage Rd West of 1660 Sugar Camp Ln, Independ	Grayson Preserve Grayson	on General Stream Health Assess ment, Public	Year Twice Per Year	Benthic macroinvert ebrates, temperature
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G5-JCUT-02	36.6839	81.1779	Grayson	Creek	Lawn	Grayson	on	Year	temperature
					Little Fox				
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	36.3950	81.1773		Fox	Sherry	Preserve	Integrati	Per	ebrates,
G5-LFC-01	2	8	Grayson	Creek	Crooke.	Grayson	on	Year	temperature
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G5-JC-01	36.684	-81.177	Grayson	Creek	21	Grayson	On	Year	temperature
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				Jumpina	y Lane	Preserve	Pollutio	Per	ebrates.
G5-JCUT-01	36.6847	-81.176	Grayson	Jumping Creek	y Lane Culvert	Preserve Grayson	Pollutio n	Per Year	ebrates, temperature

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				Shop	Property		CMC	Twice	macroinvert
				Branch	Goat	Preserve	Integrati	Per	ebrates,
G5-SBC-02	36.685	-81.169	Grayson	Creek	Shed	Grayson	on	Year	temperature
						1	General		
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					Property		Pollutio		
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G5-SBC-01	36.6864	81.1678	Grayson	Creek	Cabin	Grayson	on	Year	temperature
					Peach		General		
					Bottom		Stream		
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		-		Peach	Sugar	1	CMC	Twice	macroinvert
	36.4060	81.1377		Bottom	Camp	Preserve	Integrati	Per	ebrates,
G5-PBC-02	175	774	Grayson	Creek	Road	Grayson	on	Year	temperature
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EKCG5.011	21	01	Grayson	Creek	farm	Grayson	CMC	Year	temperature

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							Integrati on		
G5-SBCUT-03	36.4059	- 81.1006	Grayson	Shop Branch Creek	Rose Property Mountain Top Road Crossing	Preserve Grayson	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
Peak Creek-P11- 01	37.0439 815	- 80.7629 395	Pulaski	Peak Creek	The site is located within Heritage Park in Pulaski	NRV chapter of Virginia Master Naturalist s	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Island Creek	36.7861 51	- 80.6983 53	Carroll	Island Creek	500 feet northwes t from where Island Creek crosses 221, just before the fork	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Macks Creek Hiwassee	36.9647 476	- 80.6625 82	Pulaski	Big Macks Creek	Rocky Bottom Creek running through Boy Scout Camp Powhata n and along Max Creek Road, Hiwasse e 600 feet	VMN, NRV Clearwat	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General	Twice Per Year Twice	Benthic macroinvert ebrates, temperature Benthic
M8 LR 01	37.0417 8	80.5653 9	Pulaski	Little River	southwes t from	er Revival	Stream Health	Per Year	macroinvert ebrates,

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M8-CR-01	81	8	ery	y's Run	d Park Dr	s	on	Year	temperature
				, , , , , , , , , , , , , , , , , , , ,			General		1011-10
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					quarter		Pollutio		
					mile		n		
					north of		Screeni		
					where		ng,		
					Fisherma		Advoca		
					ns Ln		cy,		Benthic
		_		Laurel	meets		CMC	Twice	macroinvert
Laurel Fork Creek	36.7468	80.5526		Fork	Laurel		Integrati	Per	ebrates,
RR	5	8	Carroll	Creek	Fork Rd	VASOS	on	Year	temperature
			_				General		,
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
						1	Pollutio		
						1	n		
							Screeni		
							ng,		
					where		Advoca		
					the creek		cy,		Benthic
		-			crosses		CMC	Twice	macroinvert
	37.2327	80.5235	Montgom	Toms	Poverty		Integrati	Per	ebrates,
TC1211	92	76	ery	Creek	Creek Rd	NRVMN	on	Year	temperature
					In the "V"		General		
					formed	1	Stream		
					by	1	Health		
					Mountain	1	Assess		
					Lake Rd	NRV	ment,		Benthic
1		1	Ī	1	and	Master	Public	Twice	macroinvert
		-							
SNK-D	37.3112 62	80.5164 92	Giles	Sinking Creek	Covered Bridge	Naturalist	Educati on,	Per Year	ebrates, temperature

		1	r	January		1		1	
					Lane		Pollutio		
					near Link		n		
					Farm		Screeni		
					Covered		ng,		
	İ				Bridge		Advoca		
					Bridge		cy,		
							CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
					Between		Educati		
					where		on,		
					Clover		Pollutio		
					Hollow		n		
					Rd		Screeni		
	İ				intersect		ng, Advoca		
	1				S	NDV			Danth:
	İ				Dunford	NRV	cy,		Benthic
	1	-			Lane and	Master	CMC	Twice	macroinvert
	37.3080	80.4994		Sinking	Placid	Naturalist	Integrati	Per	ebrates,
SNK-C	56	44	Giles	Creek	Lane	S	on	Year	temperature
	1						General		
	1						Stream		
							Health		
	1						Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					0		n		
					Continue		Screeni		
					straight		ng,		
					off the		Advoca		
					southern		cy,		Benthic
		-			end of		CMC	Twice	macroinvert
	36.9423	80.4902		Little	Dulaney		Integrati	Per	ebrates,
F5-L1-1	328	531	Floyd	Indian	Rd NW	VASOS	on	Year	temperature
			,				General		'
							Stream		
							Health		
							Assess		
	İ						ment,		
	İ						Public		
	1						Educati		
	İ								
	İ						on,		
	İ						Pollutio		
	1						n		
	İ						Screeni		
	İ				Straight		ng,		
	1				line from		Advoca		
	İ				the end		су,		Benthic
	İ	-			of Troy		CMC	Twice	macroinvert
	37.1960	80.4826	Montgom	Strouble	Springs		Integrati	Per	ebrates,
M8 SC 11	576	292	ery	s Creek	Rd	NRVMN	on	Year	temperature
							General		·
	İ						Stream		
	1				1/4 mile		Health		
	İ				east of		Assess		
	İ				M8 SC		ment,		
	1				11.		Public		
	1								
	1				Straight		Educati		
1				1	line from	1	on,	1	
							Dalleria		
					last		Pollutio		Denti
					last driveway		n	. .	Benthic
		-			last driveway on		n Screeni	Twice	macroinvert
M8 SC 10	37.1956 69	- 80.4820 92	Montgom ery	Strouble s Creek	last driveway	NRVMN	n	Twice Per Year	

		•		Januar	y 2024			•	
							cy,		
							CMC		
							Integrati on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
							Screeni		
							ng,		
					Where		Advoca		
					Brunswic		cy,		Benthic
				\\\-\ -	k Dr hits	VMN -	CMC	Twice	macroinvert
MO WD 4	37.214	-80.473	Montgom	Walls	Prices	NRV	Integrati	Per	ebrates,
M8 WB 1	37.214	-80.473	ery	Branch	Fork Rd	Chapter	on General	Year	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
							Screeni		
					At the		ng,		
					end of		Advoca		
					Deerfield		су,		Benthic
		-		_	Dr off		CMC	Twice	macroinvert
M8-TC-09	37.2616 882	80.4410 848	Montgom	Toms	Deerfield Trail	VMN- NRV	Integrati	Per Year	ebrates,
WIO-1 C-09	002	040	ery	Creek	Hall	INICV	on General	Teal	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
							Screeni		
							ng,		
					behind		Advoca		
1_					Christian		су,	 	Benthic
Towne	07 4074	- 00 4440	Monter	To	sburg		CMC	Twice	macroinvert
Branch-M8-01	37.1371 87	80.4110 796	Montgom	Towne Branch	Aquatic Center	NRVMN	Integrati on	Per Year	ebrates, temperature
DIAIIGI-WO-U I	01	790	ery	Diantin	Centel	TALLY A IAILA	General	i edi	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					On		on, Pollutio		
					private		n		
					land		Screeni		
					down hill	Geoffery	ng,		
					from	Orth,	Advoca		
					1524	Kathy	су,		Benthic
lasticas De Cont	07.050.	-	Mariet	L. Jr	Harding	Orth,	CMC	Twice	macroinvert
Indian Run Station	37.2504	80.3916	Montgom	Indian	Dood	James	Integrati	Per	ebrates,
1 M8-DC-01	57 37.1600	01	ery Montgom	Run	Road	Havey	ON General	Year Twice	temperature Renthic
IAIO-DO-0 I	JU01.16	_	ivionigom	Den	Immediat	New	General	i wice	Benthic

				Januar					
	6	80.3276	ery	Creek	ely in front of the entrance to the Izaak Walton League Park about 50 yards from the intersecti on of Den Hill Road.	River Valley Chapter Izaak Walton League of America	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Per Year	macroinvert ebrates, temperature
1211DC	37.1579	- 80.3266	Montgom ery	Den Creek	Off Izaak Walton Lane near pond and train tracks	New River Valley Chapter Izaak Walton League of America	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
M8-RR-02	37.1876 73	- 80.3185	Montgom ery	Mill Creek at Thunder croft	0.6 miles south of the railroad where Mill Creek splits off from North Fork Roanoke River near Falls Ridge Rd and Delta Lane	Virginia Tech	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
RC1	36.8064 2	- 80.2681 5	Patrick	Rock Castle Creek	400 feet from where Woods Gap Rd meets Charity Hwy 1378	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic
F5-PC-01	36.9058 013	- 80.2597 549	Floyd	Pine Creek	Shooting Creek Rd SE,	VASOS	Stream Health Assess	Twice Per Year	macroinvert ebrates, temperature

			T	Januar		1	1		,
					Floyd,		ment,		
					VA		Public		
					24091		Educati		
							on,		
							Pollutio		
							n		
							Screeni		
							ng,		
							Advoca		
							cy,		
							CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n		
							Screeni		
]					ng,		
]			Behind		Advoca		
]		North	Elliston	NRV	cy,		Benthic
		-		Fork	Fire	Master	CMC	Twice	macroinvert
NFRK-ROA -	37.2287	80.2087	Montgom	Roanok	Departm	Naturalist	Integrati	Per	ebrates,
EMP-Park	73	36	ery	e River	ent	s	on	Year	temperature
			Í				General		·
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					Where		n		
					the creek		Screeni		
					crosses				
					Franklin		ng, Advoca		
					St near				Benthic
				Runnet	Hidden		cy, CMC	Twice	macroinvert
			Franklin		Valley			Per	
E0 DDC 04	26 004	90 1404		Bag		\/\/\\	Integrati		ebrates,
F8-RBC-01	36.884	80.1494	(county)	Creek	Rd	VMN	On	Year	temperature
							General Stream		
		1					Health		
		1					Assess		
		1					ment,		
							Public		
							Educati		
					400 t		on,		
		1			400 ft		Pollutio		
		1			West of		n Canadani		
		1			the fork		Screeni		
					just west		ng,		
					of where		Advoca		Describer.
44 DU 100 D'					742 runs		cy,		Benthic
11-RU20-Bla-	07.6765	-			into		CMC	Twice	macroinvert
Blackwater-	37.0763	80.0406	Franklin	Blackwa	Dillons	0.41.40	Integrati	Per	ebrates,
Dillon's Mill	7	7	(county)	ter River	Mill Rd	SML10	on	Year	temperature
]			Off		General		
					Hidden		Stream		
					Valley		Health		
					School		Assess		
		1			Rd		ment,		
		1			between		Public	l	Benthic
]			Electric		Educati	Twice	macroinvert
			. Daaal.a	. Danalaan	I □	1		I Dor	
11-RU14-Bar-BHT	37.2561	80.0339	Roanoke (city)	Barnhar t Creek	Rd and Hidden	VASOS	on, Pollutio	Per Year	ebrates, temperature

_				January					
					Valley Baseball Field		n Screeni ng, Advoca cy,		
							CMC Integrati on		
SC_US_1	36.9235 95	- 80.0211 06	Franklin (county)	Storey Creek	Other side of Franklin St across from where Wiley Dr hits it, near Blue Ridge Farm Museum	Ferrum College Stream Team	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
11-RU14-Mud- MDL-4	37.2420 18	- 80.0089 94	Roanoke (county)	Mudlick Creek	Garst Mill Park where Mud Lick Creek crosses Mud Lick Creek Greenwa y near Garst Mill Park Rd	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
JK\$3	37.8713 1	- 79.9684 5	Alleghan y	Jackson River	End of Elwood Dr off Jackson River Scenic Trail	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
11-RU23-Mag- Mag-1	37.1147	- 79.9483	Franklin (county)	Maggod dee Creek	Where the creek crosses Whisperi ng Creek Rd and Boones Mill Rd	SML10	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy,	Twice Per Year	Benthic macroinvert ebrates, temperature

							CMC Integrati		
							on		
11-RU29-Pig- Pigg-2	36.9678	- 79.9425	Franklin (county)	Pigg River	Waid Recreati on Park 350 feet north of Waid Recreati on Area VDWR Boat Ramp	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
TKR-02.51	37.2920 61	- 79.9229 2	Roanoke (city)	Tinker Creek	In Eastgate Park where 13th St NE has a cut out	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Ferguson Farm	37.0617 86	- 79.9208 58	Franklin (county)	Teels Creek	Between Teel Brooke Rd and Parkview Dr	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
11-RU25-Gil-GC-2 ROA-2	37.1583 37.2369 17	-79.855 - 79.8446	Franklin (county) Roanoke (county)	Gills Creek Roanok e River	Between the end of Lenoir Ln and Dudley Cemeter y Virginia's Explore	VASOS VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice Per	Benthic macroinvert ebrates, temperature Benthic macroinvert

				January					
		94			Park,		Health	Year	ebrates,
					below		Assess		temperature
					picnic		ment,		
		ļ .			pavilion		Public		
		ļ .					Educati		
		ļ .					on,		
							Pollutio		
							n		
							Screeni		
		ļ .					ng,		
		ļ .					Advoca		
		ļ .					cy,		
							CMC		
							Integrati		
		ļ .					_		
							on		
							General		
							Stream		
							Health		
		ļ .					Assess		
							ment,		
		ļ .					Public		
		[1]	1		Educati		
		[1]	1		on,		
		1 '	1		1		Pollutio		
		1 '	1		1		n		
		1	1		1		Screeni		
		ļ .					ng,		
		1	1		1		Advoca		
		1	1		Near the		cy,		Benthic
		<u>-</u>			end of		CMC	Twice	macroinvert
Blackwater-	37.0548	79.8245	Franklin	Blackwa	Riverdan	Riverdan	Integrati	Per	ebrates,
RiverdancePlace	72	03	(county)	ter River	ce Pl	ce Team	on	Year	temperature
Triverdancer lace	12	03	(county)	ter itiver	Cell	Ce ream	General	i cai	temperature
		ļ .							
		ļ .					Stream		
		ļ .					Health		
							Assess		
							ment,		
							Public		
		ļ .					Educati		
					600 feet		on,		
					south of		Pollutio		
		ļ .			liberty		n		
					hall lane		Screeni		
					and 600		ng,		
		ļ .			feet west	Smith	Advoca		
		ļ .			of	Mountain	cy,		Benthic
					Booker T	Lake	CMC	Twice	macroinvert
11-RU25-Gil-GC-		l _ '	Franklin	Gills	Washingt	Associati	Integrati	Per	
	37.1276	79.7832			on Huar			Year	ebrates,
LH	31.12/0	19.1032	(county)	Creek	on Hwy	on	On	i edi	temperature
		['	1]	1		General		
		['	1]	1		Stream		
		1 '	1		1		Health		
		1 '	1		1		Assess		
		['	1]	1		ment,		
		[1]	1		Public		
		1 '	1		1		Educati		
		['	1]	1		on,		
		['	1]	0.65		Pollutio		
		1 '	1		miles		n		
		1 '	1		south		Screeni		
		['	1]	along		ng,		
		[1]	Ayers		Advoca		
		1 '	1		Road		cy,		Benthic
		l - '	1	Poplar	south of		CMC	Twice	macroinvert
11-RU24-Pop-		79.7704	Franklin	Camp	Webster		Integrati	Per	ebrates,
PCC	37.0151	94	(county)	Creek	Road	VASOS	on	Year	temperature
. 55	37.0131	J-	(County)	OIGEN	2250 feet	V/1003	General	ı Gai	competature
		1 '	1						
		[1]	east of		Stream		
		[1]	where		Health		Describe
1		1 '	1		Crafts		Assess	-	Benthic
			1	Foul	Church	Ī	ment,	Twice	macroinvert
		1						_	
11-RU24-Fou- FGC	37.0422	- 79.7516	Franklin (county)	Ground Creek	Rd and Webster	VASOS	Public Educati	Per Year	ebrates, temperature

				Januar	•				
					Rd meet		on,		
							Pollutio		
							n Screeni		
							ng,		
							Advoca		
							cy,		
							CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n		
					Where		Screeni		
					the creek		ng,		
					crosses		Advoca		Daniel II
					Hardy Rd north of		cy, CMC	Twice	Benthic macroinvert
11-RU18-Ind-InR-		_	Franklin	Indian	Sundanc		Integrati	Per	ebrates,
1	37.14	79.7509	(county)	Run	e Ln	LWC	on	Year	temperature
<u>'</u>	07.11	70.7000	(county)	Tturi	O LII	20	General	ı oui	tomporataro
							Stream		
							Health		
							Assess		
							ment,		
					South of		Public		
					Booker T		Educati		
					Washingt		on,		
					on National		Pollutio n		
					Monume		Screeni		
					nt and		ng,		
					West of		Advoca		
					Valley		су,		Benthic
					Mechani		CMC	Twice	macroinvert
		-	Franklin	Gills	cal		Integrati	Per	ebrates,
11-RU25-Gil-GC-1	37.1071	79.7307	(county)	Creek	Services	VASOS	on	Year	temperature
							General		
							Stream		
					Cauthaaa		Health		
					Southeas		Assess		
					t corner of		ment, Public		
					Booker T		Educati		
					Washingt		on,		
					on		Pollutio		
					National		n		
					Monume		Screeni		
					nt, 0.3		ng,		
				ادما	miles		Advoca		Donth:
				Jack O'Lanto	east of		cy, CMC	Turico	Benthic
11-RU25-Jac-			Franklin	O'Lante rn	the end of White		Integrati	Twice Per	macroinvert ebrates,
JOL-1	37.1076	-79.73	(county)	Creek	Tail Ln	VASOS	on	Year	temperature
			\ ···· <i>y</i> /	2.00.0			General		porataro
					1		Stream		
					1		Health		
							Assess		
					Just		ment,		
					West of		Public		
					where		Educati		
					the		on,		Ponthia
					stream crosses		Pollutio n	Twice	Benthic macroinvert
		<u>-</u>	Franklin	Grimes	Wooded		Screeni	Per	ebrates,
11-RU18-Gri-GrC	37.168	79.7295	(county)	Creek	Acres Dr	VASOS	ng,	Year	temperature
			(0001119)		Di		بع… ،	. 541	.5

			1	January	y 2024	,			1
							Advoca cy,		
							CMC Integrati		
							on General		
							Stream Health		
							Assess		
							ment, Public		
							Educati		
							on, Pollutio		
							n Screeni		
							ng, Advoca		
					West of 220 Par	Virginia Master	cy,	Twice	Benthic macroinvert
11-RU18-Ind-InC-		-	Franklin	Indian	5 Lane,	Naturalist	Integrati	Per	ebrates,
1	37.1369	79.7257	(county)	Creek	Hardy	s - NRV	on General	Year	temperature
							Stream Health		
							Assess		
							ment, Public		
							Educati on,		
					400 feet	Blue	Pollutio n		
					north of	Ridge	Screeni		
					the fork where	Foothills and	ng, Advoca		
		_		Jumping	the river crosses	Lakes Master	cy, CMC	Twice	Benthic macroinvert
JRC	37.2051 7	79.7099 4	Bedford	Run Creek	Goodvie w Rd	Naturalist s	Integrati on	Per Year	ebrates, temperature
- SINO	,	7	Dealora	Orcck	Wita	3	General	Toal	temperature
							Stream Health		
							Assess ment,		
							Public Educati		
							on,		
							Pollutio n		
					Across from		Screeni ng,		
					Alpine Rd off		Advoca		Benthic
	07.455	-			Gap		cy, CMC	Twice	macroinvert
sml9	37.1681 7	79.6854 5	Bedford	Stoney Creek	Bridge Rd	VASOS	Integrati on	Per Year	ebrates, temperature
							General Stream		
							Health Assess		
							ment,		
					Where		Public Educati		
					High Point		on, Pollutio		
				South Fork of	Road, Hickory		n Screeni		
	1			"Hickory	Cove		ng,		
							Λ -1		
				Creek" (previou	Lane, and		Advoca cy,		Benthic
11-RU19-Sou-	37.1271	- 79.6332		Creek"	Lane,	Hickory Creek		Twice Per	Benthic macroinvert ebrates,

				Januar	y 2024		•		
CpR 13-JU30- Cow-CpR 59.8 Scotchtown Draft	38.1528 9	- 79.5978	Bath	Cowpas ture River	Southeas t of where Indian Draft Rd and Scotchto wn Draft Rd meet and just North of where Campbell Run hits Cowpast ure River	CRPA/TU /VMN	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
B3-BR-01	37.0861 11	- 79.5955 56	Bedford	Buck Run	Near footbridg e at bottom of Buck Run Trail at Smith Mountain Lake State Park	Blue Ridge Foothills & Lakes Master Naturalist s	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Colliers below bridge at Church St.	37.7850 82	- 79.5875 58	Rockbrid ge	Colliers Creek	Just North of 31 Church Drive Lexingto n, VA	Maury River Water Monitors	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
B3-MR-01	37.08	-79.56	Bedford	Mariner s Run	2331 Patmos Church Rd, Huddlest on, VA 24104	Blue Ridge Foothills & Lakes Master Naturalist s	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
13-JU67-Bra-6	37.949	- 79.5581	Rockbrid ge	Brattons Run	250 ft Northeas t of where Tree Ln	RACC	General Stream Health Assess ment,	Twice Per Year	Benthic macroinvert ebrates, temperature

	1			Januar	y 2024				
					crosses		Public		
					780		Educati		
							on,		
							Pollutio		
							n Corooni		
							Screeni		
							ng,		
							Advoca		
							cy, CMC		
							Integrati		
							_		
							on General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n		
					Where		Screeni		
					Kygers		ng,		
					Hill Rd		Advoca		
					and Blue	Maury	су,		Benthic
		-			Grass	Watershe	CMC	Twice	macroinvert
		79.5561	Rockbrid	Buffalo	Trail	d	Integrati	Per	ebrates,
13-JM09-Buf-10	37.7508	6	ge	Creek	meet	Monitors	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment,		
					Just east		Public		
					of the		Educati		
					curve in		on,		
					Bullpastu		Pollutio		
					re River		n .		
					Rd		Screeni		
					between	Cowpast	ng,		
40. II 100 D. I					Quiet	ure River	Advoca		Describite
13-JU63-Bul-				Dullmant	Man Rd	Preservat	CV,	Turina	Benthic
Bullpasture -	20 2000	70.5467		Bullpast	and	ion	CMC	Twice	macroinvert
Clover Creek	38.2980 1	79.5167 1	Highland	ure River	Riverben d Ln	Associati	Integrati	Per Year	ebrates,
Lower	+ '	'	піўпіапи	Rivei	u Lii	on	on General	i eai	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					where		n		
					stream		Screeni		
					intersect		ng,		
					s Edgars		Advoca		
					Way off		cy,		Benthic
		-			w	Maury	CMC	Twice	macroinvert
	37.8198	79.4916	Rockbrid	Whistle	Midland	Watershe	Integrati	Per	ebrates,
R7-WC-03	81	52	ge	Creek	Trail	d	on	Year	temperature
					0.4 miles		General		
					south		Stream		
					from		Health		
					where		Assess		
					the river		ment,		
					crosses		Public		
				1.20	Beltway		Educati		Benthic
	07.0500	70 4505	D	Little	Drive		on,	Twice	macroinvert
1	37.9538	79.4585	Rockbrid	Calfpast	after Lake	RACC	Pollutio	Per	ebrates,
R7-LCR-02	57	96	ge	ure			n	Year	temperature

		,	•	Januar		•	,		
					Merriwea		Screeni		
					ther Dam		ng,		
							Advoca		
							cy,		
							CMC		
	1		1			1	Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					Off of		Pollutio		
					Ross		n		
					Road		Screeni		
					near		ng,		
					where		Advoca		
					Stonewal		cy,		Benthic
		_			l St		CMC	Twice	macroinvert
Sarah's Run	37.7805	79.4533	Rockbrid	Sarah's	intersect		Integrati	Per	ebrates,
Station 1	56	33	ge	Run	s it	VASOS	on	Year	temperature
JIGHOTT I	- 50	- 55	yc	IXUII	Jπ	VA003	General	ı Gai	tomperature
							Stream		
							Health		
							Assess		
			1			1			
			1			1	ment, Public		
							Educati		
							on,		
							Pollutio		
							n		
							Screeni		
					893 Big		ng,		
					Spring		Advoca		
					Dr,		cy,		Benthic
		-			Lexingto		CMC	Twice	macroinvert
		79.4516	Rockbrid	Kerrs	n, VA		Integrati	Per	ebrates,
R7-KC-2	37.835	67	ge	Creek	24450	VASOS	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
	1		1			1	Educati		
	İ				Chessie		on,		
					Nature		Pollutio		
					Trail		n		
					where		Screeni		
	1		1		Lime Kiln	1	ng,		
	1		1		Road	1	Advoca		
					and		cy,		Benthic
		-			Honeysu		CMC	Twice	macroinvert
	37.7846	79.4501	Rockbrid	Woods	ckle Hill		Integrati	Per	ebrates,
13-JU76-Woo-11	49	02	ge	Creek	meet	VASOS	on	Year	temperature
	-	-				1	General		1, 2, 2, 3, 4, 5
	İ						Stream		
	İ						Health		
	1		1			1	Assess		
	1		1		Ву	1	ment,		
	1		1		Lenfest	1	Public		
	İ				Center		Educati		
	İ				for the		on,		
					Arts		Pollutio		
	1		1		where	1			
	1		1			1	n Screeni		
	1		1		stream	1			Benthic
					crosses		ng,	Turion	
			Do alabada	\\/c = -! -	Woods		Advoca	Twice	macroinvert
40 11170 141 40	07 7000	70 4400	Rockbrid	Woods	Creek	V/ACCC	Cy,	Per	ebrates,
13-JU76-Woo-12	37.7869	79.4483	ge	Creek	trail	VASOS	CMC	Year	temperature

September Sept	•				January	/ 2024				
13-JUS6-Cow- Cowpasture - Upper Sharen 79 .4415 Alleghan 7								Integrati on		
Unname d	Cowpasture -			_	ture	Dixie Mountain Trail and	CRPA	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Per	macroinvert ebrates,
R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid Rays Greek R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 42 Rockbrid R7-HC-01 Rockbrid R7-HC-0		36.6065	- 79.4193	Pittsylvan	Unname d tributary to Sandy	where the stream crosses Parker	Dan River Basin Associati	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
Maury River at Cedar Grove Branch 37.882 -79.386 ge River River Rd Rockbrid Branch 37.9580 79.3841 Rockbrid Walker Walkers ge Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Hart Rd cy, Maury Water Integrati Per ebrates, Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Per macroinvert Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Stream Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Stream Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Stream Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Stream Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, Eeram Stream Stream Stream Health Assess ment, Public Education, On, Pollutio n Screeni ng, Advoca cy, Eeram Stream Str		37.9065	- 79.3964	Rockbrid	Hays	It is in a section of Hays Creek bounded by the property at 509 Anderse n Farm	Rockbrid ge Area Conserva tion Council	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
	Maury River at Cedar Grove	37.882	-	Rockbrid ge	Maury River	South of where Hart Rd meets Maury River Rd 2488	Maury Water Monitors Rockbrid	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General	Twice Per Year Twice	Benthic macroinvert ebrates, temperature Benthic

	•			Januar			•	•	
					Road	tion	Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on		temperature
13-JU72-Wal- walkers creek 5B	37.9741	- 79.3796	Rockbrid ge	Walkers Creek	500 feet south from where McCray Ln (Hunter Access Trail) hits Walkers Creek Rd	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
13-JU74-Mou-12- MOU-01	37.874	-79.379	Rockbrid ge	Mouse Run - Maury River	south of 1657 Mt Atlas Rd, Lexingto n, VA 24450	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
12-PS01-Mid- FOMR-MDL Sweet	38.0661 9	- 79.2656 6	Augusta	Middle River	Where Middle River crosses Summer dean Rd	Friends of the Middle River	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
B3-LVUT-01	37.3851 8	- 79.2562 73	Bedford	Unname d tributary to Lake Vista	Stream located on large wooded private property between two	Central Va Master	General Stream Health Assess ment, Public Educati on,	Twice Per Year	Benthic macroinvert ebrates, temperature

			1	January					,
					lakes.		Pollutio		
					Housing		n .		
					develop		Screeni		
					ments		ng,		
					are on		Advoca		
					either		cy,		
					side of		CMC		
					the		Integrati		
					property.		on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					Half mile		on,		
					southeas		Pollutio		
					t from		n		
					where		Screeni		
					Hewitt		ng,		
					Rd and		Advoca		
					Cattlema	Friends	cy,		Benthic
12-PS01-Mid-		-			n Rd	of the	CMC	Twice	macroinvert
FOMR-MDL	38.1516	79.2017		Middle	come	Middle	Integrati	Per	ebrates,
Godfrey	4	5	Augusta	River	together	River	on	Year	temperature
- Councy			, ragaeta		togoo.		General		tomporataro
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
					riffle site				
							n Screeni		
					in Canadaala				
					Sandusk		ng,		
					y Park		Advoca		Describite
				5	near hole		cy,		Benthic
	07.0070	70.0004	L la la	Blackwa	2 on the	Daniela la la	CMC	Twice	macroinvert
17.00.00	37.3873	79.2001	Lynchbur	ter	disc golf	Randolph	Integrati	Per	ebrates,
L7-BC-03	7	9	g (city)	Creek	course	College	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					Ivy Creek		on,		
					on public		Pollutio		
					land at		n		
					the end		Screeni		
					of Club		ng,		
					Dr, right		Advoca		
					next to	Lynchbur	cy,		Benthic
		-			mowed	g Water	CMC	Twice	macroinvert
	37.4248	79.1918	Lynchbur	lvy	easemen	Resource	Integrati	Per	ebrates,
L7-IC-01	2	47	g (city)	Creek	t/trail	s	on	Year	temperature
							General		
							Stream		
							Health		
					Site		Assess		
					upstream		ment,		
					from the		Public		
					Farm		Educati		
					Basket,		on,		
					just		Pollutio		
					beyond		n		Benthic
		-		Blackwa	the Hill		Screeni	Twice	macroinvert
		79.1883	Lynchbur	ter	Street	Randolph	ng,	Per	ebrates,
1	07.4405	333	g (city)	Creek	bridge	College	Advoca	Year	temperature
L7-BC-05	37.4125								

		1	1	Januar	y 2024			1	1
							cy, CMC Integrati		
L7-RC-01	37.3648 81	- 79.1869 9	Lynchbur g (city)	Rock Castle Creek	Rock Castle Creek on next to utility easemen t above Sheffield Elementa ry School and below stream restoratio n channel from Wards Rd	Lynchbur g Water Resource s	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
L7-BC-04	37.4061 111	- 79.1825	Lynchbur g (city)	Blackwa ter Creek	Access from Blackwat er Creek Athletic Area, near the recording station from Vector Space, at the bend in the creek around the soccer field	Randolph College	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
L7-BC-06	37.4161 9	- 79.1755 7	Lynchbur	Blackwa ter	Near Lynchbur g General, go left at the bottom of the trail at the end of Thomson Dr., site is near a bench beside the trail with a small path going down to the creek and a small point bar	Randolph	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
L7-BC-06	9	7	g (city)	Creek	1,000 feet west of where	College Friends	on General Stream Health	Year	temperature Benthic
12-PS02-Mid- FOMR-MDL Chittum	38.2076 3	- 79.1652 6	Augusta	Middle River	Middle River crosses	of the Middle River	Assess ment, Public	Twice Per Year	macroinvert ebrates, temperature

				Januar		T	1		
					Green		Educati		
					Hill Ln		on, Pollutio		
							n		
							Screeni		
							ng,		
							Advoca		
							су,		
							CMC		
							Integrati		
							On		
							General Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n Screeni		
							ng,		
							Advoca		
					North of	Friends	cy,		Benthic
Middle River-		-			48 River	of the	CMC	Twice	macroinvert
12PO01-FOMR-	38.1961	79.1628		Middle	Hill Ln,	Middle	Integrati	Per	ebrates,
MDL Fuller	36	61	Augusta	River	Swoope	River	on	Year	temperature
							General		
							Stream Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					West of		n		
					the bend		Screeni		
					in Eastwoo		ng, Advoca		
					d Dr	Friends	Cy,		Benthic
12-PS05-Mid-					closest to	of the	CMC	Twice	macroinvert
FOMR-MDL 46.09				Middle	Churchvil	Middle	Integrati	Per	ebrates,
Eastwood	38.218	-79.133	Augusta	River	le Ave	River	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment, Public		
							Educati		
					Creeksid		on,		
					e trail		Pollutio		
					along the		n		
					Blackwat		Screeni		
					er Creek		ng,		
					in the		Advoca		Describe?
				Blackwa	Blackwat		cy, CMC	Twice	Benthic
			Lynchbur	ter	er creek natural	Randolph	Integrati	Per	macroinvert ebrates,
L7-BW-01	37.4187	-79.106	g (city)	Creek	area	College	on	Year	temperature
	5	. 5.150	3 (211)	U. 00K		- Juneyo	General	. 501	.cporaturo
							Stream		
					Where		Health		
					stream		Assess		
					parallels		ment,		
					Middle		Public		
					River Rd	Friends	Educati		Benthic
12-PS03-Mid-		_			West of Jet Weld	of the	on, Pollutio	Twice	macroinvert
FOMR-MDL 42.31	38.2310	79.0942		Middle	Incorpora	Middle	n	Per	ebrates,
Shulman	8	2	Augusta	River	ted	River	Screeni	Year	temperature
SHUIIIIaH									

	1	1	1	Januar	y 2024	1		1	1
							ng, Advoca		
							cy, CMC		
							Integrati		
							on General		
							Stream Health		
							Assess		
							ment, Public		
							Educati		
							on, Pollutio		
					4067		n Screeni		
					Oxford		ng,		
					Furnace Rd,		Advoca cy,		Benthic
		_		Little Beaver	Lynchbur g, VA		CMC Integrati	Twice Per	macroinvert ebrates,
C1-LBC-01	37.3669	79.0429	Campbell	Creek	24504	CVMN	on	Year	temperature
							General Stream		
							Health Assess		
							ment,		
							Public Educati		
					Where the river		on, Pollutio		
					parallels		n		
					River Bend Rd		Screeni ng,		
					north of where	Friends	Advoca cy,		Benthic
12-PS11-Mid-		-			the road	of the	CMC	Twice	macroinvert
FOMR-MDL 15.57 Dam Town	38.2189 3	78.9320 9	Augusta	Middle River	hits Dam Town Rd	Middle River	Integrati on	Per Year	ebrates, temperature
							General Stream		
							Health		
							Assess ment,		
							Public Educati		
					250 feet		on,		
					along river East		Pollutio n		
					of train tracks		Screeni ng,		
					above		Advoca		
		-		North Fork	Timbervil le		cy, CMC	Twice	Benthic macroinvert
R8-NFS-01	38.6362 8	78.7800 5	Shenand oah	Shenan doah	Memorial Park	FNFSR	Integrati on	Per Year	ebrates, temperature
1.514.501			3411	douit	7 411	7111 511	General	1 001	:Simporaturo
							Stream Health		
							Assess ment,		
					Dahussas		Public		
					Between Indian		Educati on,		
					Trail Rd and		Pollutio n		
					Flook Ln		Screeni		
					across from		ng, Advoca		Benthic
	38.4796	- 78.7757	Rockingh	Smith	Trinity Lutheran		cy, CMC	Twice Per	macroinvert ebrates,
R8SC-12	166	38	am	Creek	Church	VASOS	Integrati	Year	temperature

			ı	Januar	,	T .	T		1
							on		
	38.4882	- 78.7694	Rockingh	Smith	Near where Indian Trail Rd and Flook Ln		General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
R8SC-11	242	782	am	Creek	intersect	VASOS	on	Year	temperature
R8SC-10	38.5018 424	- 78.7543 37	Rockingh	Smith Creek	Near where it runs into Mountain Run between Hannah Bees Apiary and Fridleys Gap Rd	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
K03C-10	424	31	alli	Cieek	Сар Ки	VASUS	General	Teal	temperature
R8SC-08	38.5244 034	- 78.7524 348	Rockingh am	Smith Creek	Between 934 and Martz Rd	VASOS	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
R8MR-01	38.5022 632	- 78.7508 921	Rockingh am	Mountai n Run	3316 Fridleys Gap Rd, Harrison burg, VA 22802 Where	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic
R8SC-09	38.5156 525	- 78.7496 827	Rockingh am	Smith Creek	the stream intersect	VASOS	Stream Health Assess	Twice Per Year	macroinvert ebrates, temperature

				Januar					
					s with		ment,		
					Fridleys		Public		
					Gap Rd		Educati		
							on,		
							Pollutio		
							n .		
							Screeni		
							ng,		
							Advoca		
							cy,		
							CMC		
							Integrati		
							on General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					Between		on,		
					81 and		Pollutio		
					where		n		
					Indian	1	Screeni		
					Trail Rd	1	ng,		
					and	1	Advoca		
					Mauzy	1	cy,		Benthic
		-			Athlone		CMC	Twice	macroinvert
	38.5563	78.7400	Rockingh	Smith	Rd		Integrati	Per	ebrates,
R8SC-07	328	579	am	Creek	intersect	VASOS	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n		
					Where		Screeni		
					the		ng,		
					stream		Advoca		Б
					intersect		cy,	Turina	Benthic
	20 5602	70 7000	Dookingh	Smith	s with		CMC	Twice	macroinvert
DOCC OF	38.5682	78.7299	Rockingh		Gracelan	1/4606	Integrati	Per	ebrates,
R8SC-06	849	427	am	Creek	d Dr	VASOS	on General	Year	temperature
							Stream		
						1	Health		
						1	Assess		
						1	ment,		
						1	Public		
						1	Educati		
						1	on,		
						1	Pollutio		
						1	n		
						1	Screeni		
					Where	1	ng,		
					the	1	Advoca		
					stream	1	су,		Benthic
		-			crosses		CMC	Twice	macroinvert
	38.5647	78.7152	Rockingh	War	Jacks	1	Integrati	Per	ebrates,
R8WB-01	811	947	am	Branch	Low Rd	VASOS	on	Year	temperature
					From	1	General		
					where	1	Stream		
					Farm		Health		
				l	spring		Assess		
				Unname	Lane hits	1	ment,		
				d War	Moutain	1	Public		Benthic
	00.545	70 740 4	D	Branch	Valley	1	Educati	Twice	macroinvert
R8WBUT-01	38.5471	78.7104	Rockingh	Tributar	road, go	\/A 000	on,	Per	ebrates,
	806	04	am	У	half mile	VASOS	Pollutio	Year	temperature

West and then 900 feet South South Near Nest and then 900 Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio Near	
feet South feet South Representation General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
South Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
Integrati on General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
On General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
General Stream Health Assess ment, Public Educati on, Pollutio Near Near	
Stream Health Assess ment, Public Educati on, Pollutio Near	
Health Assess ment, Public Educati on, Pollutio Near	
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					Camp		Advoca		
				North	Lupton		CV,	Turina	Benthic
	38.8704	- 78.4907	Shenand	Fork Shenan	Barn off Lupton		CMC	Twice Per	macroinvert ebrates,
S3-NFS11	47	62	oah	doah	Rd	FNFSR	Integrati on	Year	temperature
00111011		02	Curr	douri	T C	THE CIT	General	roui	tomporataro
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
						Friends	Screeni		
						of the	ng,		
						North	Advoca		
					Downstre	Fork of	су,		Benthic
	00.00	-		l	am from	the	CMC	Twice	macroinvert
C2 LID 04	38.8859	78.4817	Shenand	Hollow	COW	Shenand	Integrati	Per	ebrates,
S3-HR-01	2	6	oah	Run	pastures	oah River	on General	Year	temperature
							Stream		
							Health		
							Assess		
							ment,		
					Moore's		Public		
					Creek at		Educati		
					Quarry		on,		Description
			Charlotte		Park US		Pollutio	Turico	Benthic
Moore's Creek at	38.0141	- 78.4779	sville	Moore's	of footbridg		n Screeni	Twice Per	macroinvert ebrates,
Quarry Park	31	74	(city)	Creek	e	VASOS	ng,	Year	temperature
			\-·-J/				ر <u>ت</u>		

				Januar	,				
							Advoca		
							cy, CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
					700 feet		Screeni		
					south of		ng,		
				North	the end		Advoca		
				Fork	of		cy,		Benthic
				Shenan	Homeste		CMC	Twice	macroinvert
C2 NEC 07	20 002	70 4722	Shenand	doah	ad Dr at	ENIECD	Integrati	Per	ebrates,
S3-NFS-07	38.903	78.4732	oah	River	River Rd	FNFSR	on General	Year	temperature
							Stream		[
							Health		
							Assess		
							ment,		[
							Public		
							Educati		
							on,		
							Pollutio		
							n Screeni		
					0.6 miles		ng,		
				North	before		Advoca		
				Fork	the end		cy,		Benthic
		_		Shenan	of Helsey		CMC	Twice	macroinvert
				Officiali			00		
	38.8972	78.4437	Shenand	doah	Bridge		Integrati	Per	ebrates,
S3-NFS-12	38.8972 12	78.4437 12	Shenand oah			FNFSR	Integrati on		
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health Assess	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health Assess ment,	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health Assess ment, Public Educati on,	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integrati on General Stream Health Assess ment, Public Educati on, Pollutio	Per	ebrates,
S3-NFS-12				doah	Bridge	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollutio n	Per	ebrates,
S3-NFS-12				doah	Bridge Lane	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollutio n Screeni	Per	ebrates,
S3-NFS-12				doah	Bridge Lane	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screening,	Per	ebrates,
S3-NFS-12				doah	Bridge Lane Behind Tom's	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca	Per	ebrates, temperature
S3-NFS-12				doah	Behind Tom's Brook	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy,	Per Year	ebrates, temperature
S3-NFS-12				doah	Behind Tom's Brook Fire	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC	Per	ebrates, temperature Benthic macroinvert
S3-NFS-12 S3-TB-01	12	-	oah	doah River	Behind Tom's Brook	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration	Per Year	ebrates, temperature
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advocacy, CMC Integration General Stream	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment,	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public Educati	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education,	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public Educati	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Pollutio	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm ent		Integration General Stream Health Assess ment, Public Education, Pollution Screening, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Screening,	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm ent		Integration General Stream Health Assess ment, Public Education, Pollution Screeni ng, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Pollution n Screeni ng, Advoca	Per Year Twice Per	Benthic macroinvert ebrates, temperature
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm ent	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screeni ng, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Screeni ng, Advoca cy, CMC Integration	Twice Per Year	Benthic macroinvert ebrates, temperature
S3-TB-01	38.9452	- 78.4394	Shenand	doah River	Behind Tom's Brook Fire Departm ent Just West of where	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollutio n Screeni ng, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Pollutio n Screeni ng, Advoca cy, CMC CMC CMC CMC CMC CMC CMC CMC CMC CM	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature
	38.9452	- 78.4394	oah	doah River	Behind Tom's Brook Fire Departm ent	FNFSR	Integration General Stream Health Assess ment, Public Education, Pollution Screeni ng, Advoca cy, CMC Integration General Stream Health Assess ment, Public Education, Screeni ng Advoca cy, CMC Integration	Twice Per Year	Benthic macroinvert ebrates, temperature

		1	1	Januar	y 2027			1	
NFS5	38.9095 92	- 78.4254 5	Shenand oah	North Fork Shenan doah River	Just East of where the river crosses Headley Rd	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
S3-CC-08	39.0818 8	- 78.4234 3	Shenand oah	Cedar Creek	400 feet Northeas t of 48 and 200 feet southeas t of Star Tannery Rd	FNFSR	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
S3-CC-09	39.0823 5	- 78.4194 4	Shenand oah	Cedar Creek	1500 feet Northeas t of 48 and 1000 feet southeas t of Star Tannery Rd	FNFSR	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
G-5	38.3325	- 78.3980 56	Greene	Conway River North	Where the stream crosses Wolftown -Hood Rd just South of Finew Farm 700 feet	Culpeper SWCD Friends	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General	Twice Per Year	Benthic macroinvert ebrates, temperature
S3-NFS-15	38.9519 12	- 78.3676 437	Shenand oah	Fork Shenan doah River	from the end of Peach Orchard	of the North Fork of the	Stream Health Assess ment,	Twice Per Year	Benthic macroinvert ebrates, temperature

	1	1	1	January				1	1
					Rd	Shenand oah River	Public Educati		
						Oall River	on,		
							Pollutio		
							n		
							Screeni		
							ng,		
							Advoca		
							cy,		
							CMC		
							Integrati		
							on General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
					400 (Educati		
					400 feet northeast		on, Pollutio		
					of where		n		
					the river		Screeni		
					crosses	1	ng,		
					662		Advoca		
					south of		cy,		Benthic
		<u>-</u>			where		CMC	Twice	macroinvert
	38.3710	78.3639		Rapidan	665 hits	Culpeper	Integrati	Per	ebrates,
M-3	7	5	Madison	River	662	SWCD	On	Year	temperature
							General Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n .		
							Screeni		
							ng, Advoca		
							cy,		Benthic
					Just	Shenand	CMC	Twice	macroinvert
12-PS74-Ced-		_	Shenand	Cedar	north of	oah	Integrati	Per	ebrates,
CC1	39.0982	78.3499	oah	Creek	Fry's Fort	University	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment, Public		
							Educati		
						1	on,		
							Pollutio		
							n		
							Screeni		
					_	1	ng,		
					Between	1	Advoca		Danith!
					Valley		cy, CMC	Turion	Benthic
	39.0067	- 78.3168	Shenand	Cedar	Pike and Stickley		Integrati	Twice Per	macroinvert ebrates,
S3-CC-10	16	87	oah	Creek	House	FNFSR	on	Year	temperature
30 00 10		<u>.</u>		U. 3010			General	. 501	.cporataro
							Stream		
					Just		Health		
					West of		Assess		
					where		ment,		
					Bohanno		Public		
					n Rd hits		Educati	Turior	Benthic
	38.4730	- 78.3155		Rose	Old Blue Ridge	Culpapar	on, Pollutio	Twice Per	macroinvert
1	38.4730 56	78.3155 56	Madison	Rose	Turnpike	Culpeper SWCD	n	Year	ebrates, temperature
M-11			IVIGUISULI		I I GITIDING			, i oai	COMPORAÇÃO

		1	ı	January	y 2024	1			1
							Screeni		
							ng,		
							Advoca		
							CV,		
						1	CMC Integrati		
						1	on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					14/1		Pollutio		
					Where		n Canadani		
					the creek crosses		Screeni		
					the train		ng, Advoca		
					tracks		cy,		Benthic
		_			near		CMC	Twice	macroinvert
	38.9752	78.2677		Passag	Bucks		Integrati	Per	ebrates,
W1-PC-03	7164	3306	Warren	e Creek	Mill rd	FNFSR	on	Year	temperature
							General	-	
							Stream		
						1	Health		
						1	Assess		
							ment, Public		
							Educati		
							on,		
							Pollutio		
					Just		n		
					South of		Screeni		
					where		ng,		
					Popham		Advoca		
					Run		су,		Benthic
		-			crosses		CMC	Twice	macroinvert
	38.5322	78.2366	NA - d'	Popham	Hughes	Culpeper	Integrati	Per	ebrates,
M-14	2	7	Madison	Run	River Rd	SWCD	on General	Year	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
						1	on,		
						1	Pollutio		
					Dialet	1	n Corooni		
					Right after		Screeni		
					Thornton	1	ng, Advoca		
				South	River	1	cy,		Benthic
		-		Fork	forks, off	1	CMC	Twice	macroinvert
	38.6572	78.2161	Rappaha	Thornto	River	Culpeper	Integrati	Per	ebrates,
R-5	2	1	nnock	n River	Lane	SWCD	on	Year	temperature
							General		
						1	Stream		
						1	Health		
						1	Assess ment,		
							Public		
						1	Educati		
					The	1	on,		
					North	1	Pollutio		
					fork just		n		
				l	north of		Screeni		
				North	the fork		ng,		Benthic
			D	Fork	below Mt	0.4	Advoca	Twice	macroinvert
10 DA11 No. D 7	20 6575	70 0450	Rappaha	Thornto	Vernon	Culpeper	CV,	Per	ebrates,
10-RA11-Nor-R-7	38.6575	78.2156	nnock	n	Ln	SWCD	CMC	Year	temperature

	1		1	Januar	y 2024	1			
							Integrati on		
W1-HC-01	38.9087	- 78.1856	Warren	Happy Creek	Between Rural King and Remount Rd	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
12-PS48-Hap-2	38.9052	- 78.1856	Warren	Happy Creek	Behind 503 US- 522, Front Royal, VA 22630	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
C-5	38.5263 89	- 78.1722 22	Culpeper	Hazel River	Where Hazel River crosses Reva Rd at Slate Mills Rd	Culpeper	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
R-2	38.5219 44 38.7133	- 78.1716 67 - 78.1511	Rappaha nnock Rappaha	Hughes River	Just West of where Hughes River crosses Reva Rd at Bridge Hughie Between Old Mill	Culpeper SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice Per	Benthic macroinvert ebrates, temperature Benthic macroinvert
R-3	3		nnock	River	Road	SWCD	Health	Year	ebrates,

				January					
					and Lee		Assess		temperature
					Highway		ment,		
					near		Public		
					Washingt		Educati		
					on Mill		on,		
							Pollutio		
							n		
							Screeni		
							ng,		
							Advoca		
							cy, CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					Between		on,		
					Rock		Pollutio		
					Mills		n		
					Road,		Screeni		
					Thunder		ng,		
					Valley		Advoca		
					Ln, and		су,		Benthic
		-			Wharton		CMC	Twice	macroinvert
	38.6538	78.1313	Rappaha	Thornto	Hollow	Culpeper	Integrati	Per	ebrates,
R-13	89	89	nnock	n River	Road	SWCD	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
					4450 ()		on,		
					1150 feet		Pollutio		
					down		n		
					first		Screeni		
					driveway		ng,		
				Thornto	off Fords	Northorn	Advoca		Benthic
				n River,	Shop Rd South of	Northern Virginia	cy, CMC	Twice	macroinvert
North Fork			Rappaha	North	where it	Trout	Integrati	Per	ebrates,
Thornton River 1	38.3942	78.1304		Fork	hits 631	Unlimited	on	Year	temperature
THOMASON ISINGI I	00.0042	70.1004	THIOOK	1 OIK	111.0 001	Ciminica	General	i cai	comporature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					Where		n		
					stream		Screeni		
					crosses		ng,		
					N James		Advoca		
					Madison		су,		Benthic
		-			Hwy near		CMC	Twice	macroinvert
	38.3536	78.1136		Crooked	White	Culpeper	Integrati	Per	ebrates,
10-RA35-Cro-C-1	1	1	Culpeper	Run	Oak Rd	SWCD	on	Year	temperature
							General		
							Stream		
						l	Health		
				North	Where	Lake	Assess		
				Anna	the river	Anna	ment,	 	Benthic
	00 / :0=	-		River -	crosses	Civic	Public	Twice	macroinvert
LE NAD OF	38.1427	78.0706		Mallory'	Mallorys	Associati	Educati	Per	ebrates,
L5-NAR-01	23	4	Louisa	s Ford	Ford Rd	on	on,	Year	temperature

				Januar	/ 2024				
							Pollutio		
							n Screeni		
							ng,		
							Advoca		
							cy,		
							CMC Integrati		
							on		
							General		
							Stream		
							Health		
							Assess ment,		
							Public		
							Educati		
							on,		
							Pollutio n		
					Where		Screeni		
					the		ng,		
					stream		Advoca		
					crosses	Goose Creek	cy,	T	Benthic
	38.8246	- 78.0482		Fiery	Hume Rd near The	Associati	CMC Integrati	Twice Per	macroinvert ebrates,
F-4	92	67	Fauquier	Run	Dell Ln	on	on	Year	temperature
			,				General		·
							Stream		
							Health Assess		
							ment,		
							Public		
							Educati		
					Where		on, Pollutio		
					the stream		n		
					crosses		Screeni		
					Fiery		ng,		
					Run Rd		Advoca		D 41:
Goose Creek-				Goose	South of John	Goose Creek	cy, CMC	Twice	Benthic macroinvert
Fiery Run Rd F4-	38.9052	78.0297		Creek	Marshall	Associati	Integrati	Per	ebrates,
GC-01	8	22	Fauquier	(Upper)	Hwy	on	on	Year	temperature
					-		General		
							Stream Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
							Screeni		
							ng,		
					At the		Advoca		Benthic
		_			end of		cy, CMC	Twice	macroinvert
	38.7630	77.9805		Thumb	Putnams		Integrati	Per	ebrates,
F14	2	8	Fauquier	Run	Mill Rd	VASOS	on	Year	temperature
							General Stream		
							Health		
					Where		Assess		
					the		ment,		
					stream		Public		
					crosses Zachary		Educati on,		
					Taylor		Pollutio		
					Hwy		n		Benthic
	00.000	-		0.4	north of	O. In	Screeni	Twice	macroinvert
10-RA38-Ced-C-2	38.3636 3	77.9758 3	Culpeper	Cedar Run	Algonqui n Trail	Culpeper SWCD	ng, Advoca	Per Year	ebrates, temperature
10-11430-060-0-2	J	l J	Culpepel	INUIT	II II dii	34400	AUVUCA	ı C ai	temperature

				January	y 2024			•	
							CV,		
							CMC Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
							n		
							Screeni		
					South of		ng,		
					River	James	Advoca		
				Big	Road W	River	cy,		Benthic
	07 7000	77.0050	Dawhata	Lickingh	near	Master	CMC	Twice	macroinvert
G4-BLC-01	37.7066 9	77.9653	Powhata	ole Creek	Leakes Mill Park	Naturalist	Integrati	Per	ebrates,
G4-BLC-UT	9	7	n	Cleek	This	S	on	Year	temperature
					unnamed				
					stream is				
					а				
					tributary				
					of the				
					James River,				
					encompa				
					ssing a				
					watershe				
					d of				
					approxim				
					ately 290				
					acres in a rural				
					area of				
					Powhata				
					n				
					County.				
					The				
					headwat				
					ers of the creek				
					and the				
					upper				
					half of				
					the				
					watershe				
					d are in a commerc				
					ial farm.				
					The				
					lower				
					half of				
					the		General		
					watershe		Stream Health		
					d surroundi		Assess		
					ng a		ment,		
					section		Public		
					of creek		Educati		
					about 0.9		on,		
				Powhat	miles in		Pollutio		
				an State Park	length is		n Screeni		
				Unname	within Powhata		ng,		
				d	n State	James	Advoca		
				Tributar	Park.	River	cy,		Benthic
		-		y of	The	Master	CMC	Twice	macroinvert
	37.6779	77.9439	Powhata	James	sampling	Naturalist	Integrati	Per	ebrates,
P7-JRUT-1	48	09	n	River	location	S	on	Year	temperature

Section Sect					January					
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Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
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Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
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Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on,	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile north of	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Run	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile north of 9150	Associati on Goose Creek Associati	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n	Per Year Twice Per	ebrates, temperature Benthic macroinvert ebrates,
Bolling Branch F4-	38.9130	- 77.8905		Bolling Branch	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile north of 9150 John S Mosby Hwy,	Goose Creek Associati on	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy,	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature
Bolling Branch F4-BB-01	38.9130	- 77.8905		Bolling Branch	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile north of 9150 John S Mosby Hwy, Uppervill	Goose Creek Associati on	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC CMC CHC CMC CMC	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature
Bolling Branch F4-	38.9130	- 77.8905		Bolling Branch	South of Rokeby Rd 200 ft South of Maidston e Rd west of Longview Ln Quarter mile north of 9150 John S Mosby Hwy,	Goose Creek Associati on	CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy,	Twice Per Year	Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature

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Goose Creek- Foxcroft L4-GC-05	38.9927 692	- 77.8799 362	Loudoun	Goose Creek- Foxcroft	9079 US- 50, Uppervill e, VA 20184	Goose Creek Associati	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Goose Creek-Oak Springs F4-GC-04	38.8795 33	- 77.8722 96	Fauquier	Goose Creek- OSGF	0.3 miles southwes t of where Grasslan ds Ct hits Woodwar d Rd	Goose Creek Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Goose Creek- Maidstone Rd F4- GC-02	38.9358 3	- 77.8705 6	Fauquier	Goose Creek	East of 2648 Rectorto wn Rd Marshall	Goose Creek Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Jeffries Branch L4-JB-01	39.0308 33	- 77.8702 78	Loudoun	Jeffries Branch	Directly East of where Hill Rd becomes Trappe Rd	Goose Creek Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
F-10	38.7041 67	- 77.8380 56	Fauquier	Great Run (West)	Where Great Run crosses Black	John Marshall SWCD	General Stream Health Assess ment,	Twice Per Year	Benthic macroinvert ebrates, temperature

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F-3 38.7003 77.8214 Fauquier Fau						crosses		ng,		
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F-3 38.7003 77.8214 Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Fauquier Cromwells Run F4-CR-01 Assess Fauquier F						Rd near		CV.		Benthic
F-3 38.7003 77.8214 Fauquier Fauquier Fauquier (East) Run (East) Leonards Ln Marshall SWCD General Stream Health Assess ment, Public Educati on On Pollutio n Screeni ng, Advoca cy, Advoca cy, Integrati Office Per Year Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Assess ment, Public Assess ment, Per Year The stream Health Assess ment, Por Year Twice Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, temperature Benthic macroinvert ebrates, Twice per Year Twice per Year Twice Benthic macroinvert ebrates, Twice per Year Twice Benthic macroinvert ebrates, Twice per Year Twice Per Year Twice Per Year Benthic macroinvert ebrates, Twice Por Year Twice Per Year Benthic macroinvert ebrates,					Great		John	CMC	Twice	
F-3 38.7003 77.8214 Fauquier (East) Ln SWCD on Year temperature Cromwells Run F4-CR-01										
Cromwells Run F4-CR-01			-	l						
Cromwells Run F4-CR-01 Sa. 3330 Fauquier Fauqui	F-3	38.7003	77.8214	Fauquier	(East)	Ln	SWCD		Year	temperature
Cromwells Run F4-CR-01 Sa. 3330 Fauquier Fauqui		ĺ	ĺ					General		
Cromwells Run F4-CR-01 Sa. 9330 Fauquier Fauqui	1	ĺ	ĺ							
Cromwells Run F4-CR-01		1	1							
Cromwells Run F4-CR-01		ĺ	ĺ							
Cromwells Run F4-CR-01 - Tauquier Salage Sa		1	1							
Cromwells Run F4-CR-01 - Tauquier F4-CR-01 - Tauquier F4-CR-01 - Tauquier F4-CR-01 - Tauquier F4-CR-01 - The stream is located in a non-public access Anna Educati		ĺ	ĺ							
Cromwells Run F4-CR-01 - Tauquier - Training Barn Rd turns into Smitten Stream is located in a non- public access area of a 38.1333 - T7.8055 Spotsylv Pigeon Where Training Barn Rd turns into Smitten Smitten Screeni ng, Advoca Croek Creek Creek Associati On Screeni ng, Advoca Creek Associati On Screeni ng, Advoca Creek Associati On Smitten Stream is located in a non- public access Anna Civic On, Pollutio N Benthic macroinvert ebrates, Benthic macroinvert ebrates, Twice Benthic macroinvert ebrates, Twice Macroinvert ebrates, On Twice Macroinvert ebrates, On Twice Associati On Twice Macroinvert ebrates, On Twice Macroinvert ebrates,		1	1							
Cromwells Run F4-CR-01 - Tauquier - Training Barn Rd turns into Smitten Stream is located in a non- public access area of a 38.1333 - T7.8055 Spotsylv Pigeon Where Training Barn Rd turns into Smitten Smitten Screeni ng, Advoca Croek Creek Creek Associati On Screeni ng, Advoca Creek Associati On Screeni ng, Advoca Creek Associati On Smitten Stream is located in a non- public access Anna Civic On, Pollutio N Benthic macroinvert ebrates, Benthic macroinvert ebrates, Twice Benthic macroinvert ebrates, Twice Macroinvert ebrates, On Twice Macroinvert ebrates, On Twice Associati On Twice Macroinvert ebrates, On Twice Macroinvert ebrates,		1	1					Educati		
Cromwells Run F4-CR-01 Results in a non-public access area of a 38.1333 77.8055 Spotsylv Pollutio n Screeni ng, Advoca Cy, Cmw Earm Ln Cromwells Run Farm Ln Cromwells Run Screeni ng, Advoca Cy, CMC Twice macroinvert ebrates, temperature Remacroinvert ebrates, temperature Remacroinvert Remacr	1	ĺ	ĺ							
Cromwells Run F4-CR-01 Sa.9330 Fauquier Training Barn Rd turns into Screeni ng, Advoca cy, Creek CMC Twice Macroinvert Per ebrates, The stream is located in a non- public access Anna Fauquier Twice Per ebrates, The stream is located in a non- public access Anna Fauquier Twice Per ebrates, The stream is located in a non- public access Anna Educati macroinvert Per ebrates, Twice Per ebrates, The stream is located in a non- public access Anna Educati on, Twice macroinvert ebrates, Twice Public macroinvert pollic macroinvert ebrates, Twice Public per ebrates, Pollutio Per ebrates,		1	1							
Cromwells Run F4-CR-01 Respond to the latter of the latte	1	ĺ	ĺ							
Cromwells Run F4-CR-01 Representation of the stream is located in a non-public access area of a constant of the stream is located in a non-public access area of a constant of the stream is area.		1	1							
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Cromwells Run F4-CR-01 Representation of the stream is located in a non-public access Anna and stream is area of a VA State 38.1333 77.8055 Spotsylv Pigeon Training Barn Rd turns into Smitten Farm Ln Cromwe Smitten Farm Ln Goose cy, Creek Associati Integrati On Twice Per ebrates, temperature Advoca cy, Creek Associati Integrati On The Stream Health Assess ment, Public access Anna Educati On, Twice Per ebrates, Training Barn Rd Goose cy, Creek Associati Integrati On Twice Per ebrates, Training Benthic macroinvert ebrates, The Stream Health Assess ment, Public access Anna Educati On, Twice Per ebrates,		ĺ	ĺ			Where		ng,		
Cromwells Run F4-CR-01 Representation of the stream is located in a non-public access Anna associati area of a VA State 38.1333 77.8055 Spotsylv Pigeon Reprinch Goose Cry, Creek Associati turns into Smitten turns into Smitten turns into Smitten turns into Smitten Associati on On On On On On On On On On On On On On		1	1							
Cromwells Run F4-CR-01 - 77.8077 8 Fauquier Fauquier Fauqui		ĺ	ĺ				Goose			Benthic
Cromwells Run F4-CR-01 Smitten Farm Ln Smitten Farm Ln Stream Health Health Assess in a non- public access Anna area of a 38.1333 77.8055 Spotsylv Pigeon Smitten Farm Ln Associati on Integrati on General Stream Health Assess ment, Public access Anna Educati on, Twice macroinvert ebrates, Year Benthic macroinvert ebrates, Per year Benthic macroinvert ebrates, Per year Benthic macroinvert ebrates, Per year Per year Benthic macroinvert ebrates, Per year Per year Benthic macroinvert ebrates, Pollutio Per ebrates, Per year Per		1	1					CN4C	Turion	
F4-CR-01 6 8 Fauquier IIs Run Farm Ln on on Year temperature The stream is located in a non-public access Anna area of a Civic on, Twice macroinvert ebrates, 38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per temperature The stream In the stream is located in a non-public access Anna area of a Civic on, Twice macroinvert ebrates,	0	00.000	-		0					
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The stream is located in a non-public access Anna Educati on, Twice macroinvert area of a VA State Associati Pollutio Per ebrates,	F4-CR-01	6	8	Fauquier	lls Run	Farm Ln	on	on	Year	temperature
The stream is located in a non-public access Anna Educati area of a Civic on, Twice macroinvert ebrates,										
stream is located in a non-public access Anna Educati area of a Civic on, Twice macroinvert ebrates,	1	1	1			The				
located in a non-public access Anna Educati on, Twice macroinvert ebrates, 38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per Ebrates,	1	I	ĺ							
in a non-public Lake Public Benthic access Anna Educati on, Twice macroinvert ebrates,			1	l						
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public access Anna Educati area of a Civic on, Twice macroinvert ebrates, 38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per ebrates,										
access Anna Educati on, Twice macroinvert ebrates, 38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per ebrates,						in a non-		ment,		
- 38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per ebrates,						in a non-	Lake	ment,		
38.1333 77.8055 Spotsylv Pigeon VA State Associati Pollutio Per ebrates,						in a non- public		ment, Public		Benthic
						in a non- public access	Anna	ment, Public Educati	Twice	
PGN1 33 56 ania Run Park on n Year temperature		20.4222	-	Chata	Dies-	in a non- public access area of a	Anna Civic	ment, Public Educati on,		macroinvert
						in a non- public access area of a VA State	Anna Civic Associati	ment, Public Educati on, Pollutio	Per	macroinvert ebrates,

			1	January	/ 2024	1			
							Screeni ng,		
							Advoca		
							су,		
							CMC		
							Integrati on		
							General		
							Stream		
							Health		
							Assess		
							ment, Public		
							Educati		
							on,		
					0.3 miles		Pollutio		
					south of where		n Screeni		
					Notre		ng,		
					Dame Ln		Advoca		
0					and	Goose	cy,	T	Benthic
Goose Creek-St. Louis Rd L4-GC-	38.9869	77.7908		Goose	Creek Ridge Ln	Creek Associati	CMC Integrati	Twice Per	macroinvert ebrates,
03	4	3	Loudoun	Creek	meet	on	on	Year	temperature
							General		
							Stream		
							Health Assess		
							ment,		
							Public		
					\A/I		Educati		
					Where Evening		on, Pollutio		
				Unname	Star Dr,		n		
				d	E		Screeni		
				Tributar y of	Loudoun St, and		ng, Advoca		
				North	Newberr	Loudoun	Cy,		Benthic
		-		Fork	У	Wildlife	CMC	Twice	macroinvert
Round Hill Trib to	39.1345	77.7639	l accelación	Goose	Crossing	Conserva	Integrati	Per	ebrates,
Sleeter Lake	27	35	Loudoun	Creek	PI meet	ncy	on General	Year	temperature
							Stream		
							Health		
							Assess ment,		
							Public		
							Educati		
					0501		on,		
					250 feet west		Pollutio n		
					from		Screeni		
					where		ng,		
					Foxcroft Rd and	Goose	Advoca		Benthic
UTGoose Creek-		-			Snake	Creek	cy, CMC	Twice	macroinvert
Snake Hill L4-	38.9961	77.7516		Snake	Hill Rd	Associati	Integrati	Per	ebrates,
GCUT-01	28	8	Loudoun	Hill	meet	on	On	Year	temperature
							General Stream		
							Health		
							Assess		
							ment, Public		
							Educati		
							on,		
					25 yards		Pollutio		
Goose Creek					from road.		n Screeni		
Tributary Good					Horse	Goose	ng,		Benthic
	00.0050	-		D	trail runs	Creek	Advoca	Twice	macroinvert
Stone Inn/Bear Branch	38.9956 934	77.7514 086	Loudoun	Bear Branch	through tributary.	Associati on	cy, CMC	Per Year	ebrates, temperature
Dianon	304	000	Loudouli	Dialiti	ilibutary.	UII	CIVIC	ı c ai	temperature

				Janaan	y 2024				
							Integrati on		
North Fork-Lickey Mill Rd L4-NF-26	39.1166 9	- 77.7500 8	Loudoun	North Fork Goose Creek	where the creek crosses Tranquilit y Rd at Lickey Mill Rd	Goose Creek Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
L4-NFCC-01	39.1961 98	- 77.7470 31	Loudoun	North Fork Catoctin Creek	700 feet northeast of where Stony Point Rd, Cider Mill Rd, and Woodgro ve Rd meet	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
XPINY#1 - LWC #15	39.2879 44	- 77.7379 75	Loudoun	Sweet Run Trib of Piney Run	End of Arnold Trail Lot / Sweet Run State Park	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
North Fork Goose Creek (GCA 28)	39.1092 8 39.2881	- 77.7369 2 - 77.7361	Loudoun	North Fork Goose Creek	Where the creek crosses Silcott Springs Rd Located 100	Goose Creek Associati on Loudoun Wildlife	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice Per	Benthic macroinvert ebrates, temperature Benthic macroinvert
Piney Run	533	337	Loudoun	Run	yards	Conserva	Health	Year	ebrates,

				January	7 2027				
					upstream from trail crossing; before confluen ce with Sweet Run; near huge rock formation at bend in stream	ncy	Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on		temperature
North Fork Goose Creek (GCA 29)	39.0926 2	- 77.7156 9	Loudoun	North Fork Goose Creek	Where the creek crosses New Ford Road just south of Guinea Bridge Rd	Goose Creek Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL12-Cro- CROOK#1 - LWC #6	39.0912	-77.684	Loudoun	Crooked Run	Just West of where Forest Mills Rd and Oakland Green Rd meet	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
N Fork Catoctin RA Upstream	39.1792 821	- 77.6816 07	Loudoun	North Fork Catoctin Creek	350 feet South along Berlin Turnpike from the intersecti on with Fremont Overlook Ln, then west to the stream	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
N Fork Catoctin RA Downstream	39.1939 39	- 77.6676 4	Loudoun	North Fork Catoctin Creek	Straight south from the end of Grace PI	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on,	Twice Per Year	Benthic macroinvert ebrates, temperature

		,		January	/ 2024	,			
							Pollutio n		
							Screeni		
							ng,		
							Advoca		
							cy, CMC		
							Integrati		
							on		
							General Stream		
							Health		
							Assess		
							ment,		
							Public Educati		
							on,		
					300 feet		Pollutio		
					South of where		n Screeni		
					Aldie		ng,		
					Dam Rd		Advoca		
					crosses	Goose	CV,	Turkan	Benthic
Little River-Aldie		77.6511		Little	the River in Aldie	Creek Associati	CMC Integrati	Twice Per	macroinvert ebrates,
Dam Rd F4-LR-02	38.976	4	Fauquier	River	Park	on	on	Year	temperature
							General		
							Stream Health		
							Assess		
					Edge of		ment,		
					James S		Public		
					Long Regional		Educati on,		
					Park		Pollutio		
					between		n		
					Burnside Farm Pl		Screeni		
					and		ng, Advoca		
					Bowers		су,		Benthic
09-PL43-Cat- Catharpin Run -			Prince	Catharpi	Family Christma		CMC	Twice Per	macroinvert
Elaine Wilson	38.8509	77.6352	William	n Run	s Trees	VASOS	Integrati on	Year	ebrates, temperature
							General		
							Stream		
							Health Assess		
							ment,		
							Public		
							Educati on,		
							Pollutio		
							n		
					Where Thompso		Screeni ng,		
					ns Mill		Advoca		
					Rd		cy,		Benthic
	20 4500	- 77 6000		Door	becomes	John	CMC	Twice	macroinvert
F-15	38.4522 2	77.6288 9	Fauquier	Deep Run	Cropp Rd	Marshall SWCD	Integrati on	Per Year	ebrates, temperature
_					-		General		p. 2. 2. 2. 2.
							Stream		
							Health Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
South Fork						Loudoun	n		Benthic
Catoctin - Phillips	00.4555	-		South		Wildlife	Screeni	Twice	macroinvert
Farm Upstream Site LWC	39.1862 31	77.6177 13	Loudoun	Fork of Catoctin	Janney St	Conserva	ng, Advoca	Per Year	ebrates,
SILE LAAC	JI	IJ	Loudouli	Calucilli	Jι	ncy	AUVUCA	i eai	temperature

		•	1	January	2024				1
							cy,		
							CMC		
							Integrati		
							on General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					Near		Pollutio		
					Main St		n		
					between The		Screeni		
					Phillips		ng, Advoca		
				South	Farm	Loudoun	cy,		Benthic
09-PL02-Sou-				Fork	and John	Wildlife	CMC	Twice	macroinvert
SFCAT#5 -		-		Catoctin	Wesley	Conserva	Integrati	Per	ebrates,
LWC#17	39.1902	77.6149	Loudoun	Creek	Church	ncy	on	Year	temperature
							General		
							Stream		
					Where		Health Assess		
					LaRoque		ment,		
					Run		Public		
					crosses		Educati		
					Spotswo		on,		
					od		Pollutio		
					Furnace		n .		
					Rd near the fork		Screeni		
					between		ng, Advoca		
					LaRoque	IWLA -	Cy,		Benthic
		_			Run and	Rappaha	CMC	Twice	macroinvert
	38.3328	77.6126	Spotsylv	LaRoqu	Pipe	nnock	Integrati	Per	ebrates,
LaRoque Run 1	71	46	ania	e Run	Dam Run	Chapter	on	Year	temperature
							General		
							Stream		
							Health Assess		
							ment,		
							Public		
					Between		Educati		
					the fork		on,		
					of Pipe		Pollutio		
					Dam Run		n Carrage:		
					and La Roque		Screeni		
					Roque Run and		ng, Advoca		
					Spotswo	IWLA			Benthic
		-		Pipe	od	Rappaha	cy, CMC	Twice	macroinvert
	38.3327	77.6113	Spotsylv	Dam	Furnace	nnock	Integrati	Per	ebrates,
Pipe Dam Run 1	85	17	ania	Run	Rd	Chapter	on	Year	temperature
							General		
							Stream		
							Health Assess		
							ment,		
							Public		
							Educati		
							on,		
					0".5		Pollutio		
					Off Dry		n Saraani		
					Mill Rd between		Screeni ng,		
					Cook		Advoca		
					Farm	Loudoun	cy,		Benthic
		-			Lane and	Wildlife	CMC	Twice	macroinvert
	39.1127	77.5983		Dry Mill	Owls	Conserva	Integrati	Per	ebrates,
Dry Mill Branch	09	33	Loudoun	Branch	Head Ln	ncy	on	Year	temperature
SRW2	37.6201	-	Henrico	Stony	Between	Henrico	General	Twice	Benthic

					y 2024				
	44	77.5971 71		Run West 2	end of Rocky Point Pkwy and Windbluff Ct	Area Water Quality Samplers (HAWQS)	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Per Year	macroinvert ebrates, temperature
09-PL14-Goo- WaterCress#2 - LWC #21	39.0231	- 77.5886	Loudoun	Goose Creek Tributar y	In Banshee Reeks Nature Preserve , half a mile west of where Great Woods Dr hits Evergree n Mills Rd	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Cedar Run-15- PL38-Ced-R1	38.6329	- 77.5883 5	Prince William	Cedar Run	Continue following the path of the last driveway off Carriage Ford Rd until you hit the stream	Prince William SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
DRYMILBRA0.2	39.1022 93	- 77.5849 89	Loudoun	Dry Mill Branch	North of Rollins Dr SW and South of Country Club Green Condomi nium	LWC	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
TUSCRE5.0	39.1015 65	- 77.5801 12	Loudoun	Tuscaro ra Creek	Site next to culvert at abandon ed golf course.	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public	Twice Per Year	Benthic macroinvert ebrates, temperature

				Januar				•	
					Also next		Educati		
					to		on,		
					residenti		Pollutio		
					al		n Screeni		
					neighbor hood.		ng,		
					1100u.		Advoca		
							Cy,		
							CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati on,		
					Between		Pollutio		
					Whites		n		
					Ferry		Screeni		
					Manor		ng,		
					and Blue		Advoca		
					Sky	Loudoun	су,		Benthic
		<u>-</u>			Landsca	Wildlife	CMC	Twice	macroinvert
09-RU57-Bla-	39.0114	77.5786	1	Black	ping,	Conserva	Integrati	Per	ebrates,
BLACK1 - LWC24	1326	87	Loudoun	Branch	LLČ	ncy	on General	Year	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n Caraca:		
					112 Dry		Screeni ng,		
					Mill Rd		Advoca		
					SW,	Loudoun	cy,		Benthic
		_			Leesburg	Wildlife	CMC	Twice	macroinvert
	39.1149	77.5715		Town	, VA	Conserva	Integrati	Per	ebrates,
TOWBRA1.0	85	47	Loudoun	Branch	20175	ncy	on	Year	temperature
							General		
							Stream		
							Health		
							Assess ment,		
							Public		
							Educati		
							on,		
					Across		Pollutio		
					from 1st		n		
					parking		Screeni		
					lot at		ng,		
					Olde	Land	Advoca		Don'th:
				Tuesers	Izaak	Loudoun Wildlife	cy, CMC	Twice	Benthic
	39.1026	- 77.5691		Tuscaro ra	Walton League	Conserva	Integrati	Per	macroinvert ebrates,
TUSCRE4.4	43	97	Loudoun	Creek	Park	ncy	on	Year	temperature
		<u> </u>		0.001		,	General	. 531	ioporacaro
							Stream		
							Health		
							Assess		
							ment,		
					0.3 miles		Public		
					south of River	Frederick	Educati		Benthic
		_			Road at	sburg	on, Pollutio	Twice	macroinvert
	38.3222	77.5668	Spotsylv	Mine	Belle	IWLA	n	Per	ebrates,
S6-MR-01	59	42	ania	Run	River Dr	Chapter	Screeni	Year	temperature
				•	•		•		

			,	Januar	7 2024	•			
							ng, Advoca		
							cy,		
							CMC Integrati		
							on		
					On the other		General Stream		
					side of		Health		
					Harrison		Assess		
					St SE from the		ment, Public		
					northwes		Educati		
					t corner of		on, Pollutio		
					Brandon		n		
					Park, behind		Screeni		
					The		ng, Advoca		
					Branch - Restaura		cy,	Turing	Benthic
	39.1056	77.5623		Town	nt &		CMC Integrati	Twice Per	macroinvert ebrates,
TOWBRA0.1	02	6	Loudoun	Branch	Bowling	LWC	on	Year	temperature
							General Stream		
							Health		
							Assess ment,		
							Public		
							Educati on,		
					Approxim		Pollutio		
					ately one mile		n Corooni		
					downstre		Screeni ng,		
					am from	1	Advoca		Danthia
		_			housing develop	Loudoun Wildlife	cy, CMC	Twice	Benthic macroinvert
Willowsford	38.9639	77.5594	l	Broad	ment and	Conserva	Integrati	Per	ebrates,
Grange Bridge	79	17	Loudoun	Run	winery	ncy	on General	Year	temperature
							Stream		
							Health Assess		
							ment,		
					In northeast		Public Educati		
					corner of		on,		
					far meadow		Pollutio		
					on HOA		n Screeni		
					common		ng, Advoca		
					area near	Loudoun	cy,		Benthic
	20.0740	-		Cata atia	Common	Wildlife	CMC	Twice	macroinvert
CATCRE1.0	39.2742 71	77.5574 8	Loudoun	Catoctin Creek	House Lane.	Conserva ncy	Integrati on	Per Year	ebrates, temperature
							General		
							Stream Health		
							Assess		
							ment, Public		
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					Where Tuscaror		on, Pollutio		
					a Creek		n		
					crosses W&OD		Screeni ng,		
					trail in	Loudoun	Advoca		Benthic
	39.0955	-		Tuscaro ra	Tuscaror a Creek	Wildlife Conserva	cy, CMC	Twice Per	macroinvert ebrates,
TUSCRE2.2	5	77.5424	Loudoun	Creek	Park	ncy	Integrati	Year	temperature

	1	1	1	January	7 2024	1		1	
							on General		
JK Black Oak	39.2155	- 77.5368	Loudoup	Unname d Tributar y - Limesto ne	42389 Stumpto	Loudoun Wildlife Conserva	Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per	Benthic macroinvert ebrates,
Upstream BIGSP1	39.1441 67	- 77.5363 89	Loudoun	Big Spring	Underne ath bridge near Morven Park	Loudoun Wildlife Conserva ncy	on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
JK Black Oak Downstream	39.2121 66	- 77.5359 79	Loudoun	Unname d Tributar y - Limesto ne Branch	Across James Monroe Hwy from Lucketts Commun ity Park	Loudoun Wildlife Conserva ncy	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
The Preserve at Goose Creek Limestone Branch	39.0365 7	- 77.5321 69	Loudoun	Goose Creek Unname d Tributar y	Quarter mile south of where the creek crosses Sycolin Rd Temple Hall	Goose Creek Associati on Loudoun Wildlife	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice	Benthic macroinvert ebrates, temperature Benthic macroinvert
Upstream at Temple Hall	39.1778 63	77.5304 59	Loudoun	ne Branch	Farm Regional	Conserva ncy	Health Assess	Per Year	ebrates, temperature

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					mile		Educati		
					northwes		on,		
					t of		Pollutio		
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					Hall Ln		ng,		
					and		Advoca		
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					e School		cy, CMC		
					rd meet		Integrati		
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					stream		Advoca		
					crosses	Loudoun	су,		Benthic
		-		Limesto	Limeston	Wildlife	CMC	Twice	macroinvert
Limestone Branch	39.1748	77.5298		ne	e School	Conserva	Integrati	Per	ebrates,
X1LIM1 - LWC5	22	94	Loudoun	Branch	Rd	ncy	on	Year	temperature
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					500 feet		Advoca		
					northeast	Loudoun			Benthic
					of New	Wildlife	cy, CMC	Twice	macroinvert
Goose Creek	39.0911	77.5020		Goose	Coton		Integrati	Per	
			Laudaun			Conserva			ebrates,
Riverside Parkway	89	39	Loudoun	Creek	Bridge	ncy	On	Year	temperature
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						l	Advoca		5
						Loudoun	cy,		Benthic
DEAL (ED.::-					End of	Wildlife	CMC	Twice	macroinvert
BEAVER#3 -	39.0241	77.4968		Beaverd	Plymouth	Conserva	Integrati	Per	ebrates,
LWC#25	58	75	Loudoun	am Run	PI	ncy	on	Year	temperature
							General		
					Off trail		Stream		
					before		Health		
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				Tributar	that	Loudoun	Public	l . .	Benthic
Beaverdam Run	00.0000	-		y of	borders	Wildlife	Educati	Twice	macroinvert
T-20	39.0380	77.4928		Beaverd		Conserva	on,	Per	ebrates,
Tributary	28	33	Loudoun	am Run	houses	ncy	Pollutio	Year	temperature

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							n Screeni ng, Advoca cy, CMC Integrati		
Alum Spring	38.2892 7	- 77.4811	Stafford	Hazel Run	Alum Spring Park where the river crosses Greenbri er Dr	IWLA	on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati	Twice Per Year	Benthic macroinvert ebrates, temperature
Bull Run_17_PL44_Be nLomond1	38.7993 68	- 77.4768 2	Prince William	Bull Run -Ben Lomond Park	In Bull Run Regional Park south of Atlantis Waterpar k and east of shelter 6	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL45-Cub- CR13	38.8211 4	- 77.4654 5	Fairfax (county)	Cub Run	Where Compton Rd crosses 66	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
P10-PC-PL46_21- MP1	38.7741 1	- 77.4330 5	Prince William	Russia Branch	Parallel to train tracks near entrance to Hemlock Overlook Regional Park	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy,	Twice Per Year	Benthic macroinvert ebrates, temperature

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							CMC Integrati on		
09-PL45-Wal- CR 11	38.8566	- 77.4322	Fairfax (county)	Walney Creek	Ellanor C Lawrenc e Park where the stream crosses Creek Trail (midway through the loop)	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL45-Big-CR5	38.8556	- 77.4292	Fairfax (county)	Big Rocky Run	Just north of Cabell's Mill off Walney Rd	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
18-PL18-Hor-HP5	38.9247 6	- 77.4065 96	Fairfax (county)	Horsepe n Run	2860 Bradley Acres Ct, Herndon, VA 20171	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Horse Pen Run Sterling - LWC#100 Neabsco Creek- 15-PL49-Nbsco-	39.0507 15 38.6562 29	- 77.3973 83 - 77.3764	Loudoun Prince William	Horse Pen Run Neabsc o Creek	just south of where stream crosses Algonkia n pkwy 350 feet from the	Loudoun Wildlife Conserva ncy Stream Team	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice Per	Benthic macroinvert ebrates, temperature Benthic macroinvert

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					crosses Sugarlan		Public Educati		
					d Run		on,		
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					the Dranesvil		Screeni ng,		
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					Trailhead		су,		Benthic
00 DI 04 O	00.0054	-	□ - ' (0	and	Northern	CMC	Twice	macroinvert
09-PL21-Sug- SLR6	39.0054 7	77.3724 79	Fairfax (county)	Sugarla nd Run	Millwood Pond	Virginia SWCD	Integrati on	Per Year	ebrates, temperature
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					675 and		ng,		
					Washingt on and		Advoca		Benthic
					Old	Reston	cy, CMC	Twice	macroinvert
09-PL21-Sug-		-	Fairfax	Sugarla	Dominion	Associati	Integrati	Per	ebrates,
SLR2	38.9592	77.3714	(county)	nd Run	Trail	on	on	Year	temperature
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					stream		on,		
					crosses		Pollutio		
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					Rd south of		Screeni ng,		
					Eastwoo		Advoca		
					d Homes		су,	l	Benthic
Cornelius Crast	27 4705			Comelin	at		CMC	Twice	macroinvert
Cornelius Creek 01	37.4795 3	- 77.3655	Henrico	Corneliu s Creek	Hughes Farm	HAWQS	Integrati on	Per Year	ebrates, temperature
		77.0000	. 10111100	3 Olook	where		General	roui	tomporature
					the creek		Stream		
				Oue-ti-	crosses		Health		Donthi -
Quantico Creek-		_		Quantic o Creek	Scenic Dr near		Assess ment,	Twice	Benthic macroinvert
South Fork-15-	38.5675	77.3649	Prince	- South	Prince		Public	Per	ebrates,
Coduit Fork To				Fork	William	VASOS			

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					Forest		on,		
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					and		ng, Advoca		
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				nd Run	Lake	Reston	CMC	Twice	macroinvert
09-PL21-Sug-		-	Fairfax	Tributar	Newport	Associati	Integrati	Per	ebrates,
SLR4	38.9788	77.3644	(county)	у	Rd	on	on	Year	temperature
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							Health Assess		
							ment,		
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					the		Educati		
					stream		on,		
					crosses		Pollutio		
					Colchest		n		
					er Rd		Screeni		
					just		ng,		
					south		Advoca		Benthic
				Popes	Colchest er	Northern	cy, CMC	Twice	macroinvert
09-PL46-Pop-		<u>-</u>	Fairfax	Head	Overpas	Virginia	Integrati	Per	ebrates,
PHC2	38.7889	77.3621	(county)	Creek	S	SWCD	on	Year	temperature
			(CCC)			0.1.0	General		10111
							Stream		
							Health		
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00 Pl 00 0			- · ·	en	Commun	Reston	CMC	Twice	macroinvert
09-PL22-Sna-	20 0267	77 2500	Fairfax	Drongh	ity	Associati	Integrati	Per	ebrates,
DR29	38.9367	77.3589	(county)	Branch	Center	on	on General	Year	temperature
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							Health		
							Assess		
					In Fred		ment,		
					Crabtree		Public		
					Park 900		Educati		
					feet north		on,		Donthi-
		_		Little	of the end of	Northern	Pollutio n	Twice	Benthic macroinvert
	38.9110	77.3581	Fairfax	Difficult	Shady	Virginia	Screeni	Per	ebrates,
DR04	96	56	(county)	Run	Mill Ln	SWCD	ng,	Year	temperature
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							Advoca cy, CMC Integrati		
09-PL22-Sna- DR19	38.9299	- 77.3459	Fairfax (county)	Snaked en Branch	Between Soapston e Dr and Old Trail Dr	Reston Associati on	on General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-The- DR17	38.9228	- 77.3454	Fairfax (county)	The Glade	Off Soapston e Dr between Walker Nature Center Campfire Ring and Little Free Library Charter 111478	Reston Associati on, Dominion Christian School	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-Sna- DR30	38.9289	- 77.3397	Fairfax (county)	Snaked en Branch	Behind Walker Nature Center off Snakede n Branch Trail	Reston Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-Col- DR28	38.957	- 77.3334	Fairfax (county)	Colvin Run	south of Lake Anne Nursery Kinderga rten	Reston Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature

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P10-PC-21_PL51- 02	38.6076 82	- 77.3311	Prince William	Powells Creek	250 feet south of where creek crosses Northgat e Dr	VASOS	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL01-Col- DR20	38.9634	- 77.3299	Fairfax (county)	Colvin Run (unnam ed tributary	At the fork just North of Park Glen Ct	Reston Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-Col- DR27	38.9619 44	- 77.3236 11	Fairfax (county)	Colvin Run (unnam ed tributary	In Lake Fairfax Park Between the Campgro und and Bentana Way	Reston Associati on	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
Occoquan_23_PL 47_Airport Creek_trb1	38.6937 8	- 77.3234 6	Prince William	Airport Creek	Between Spring Woods Dr and Lake Ridge Park accessibl e by airport creek trail Between	Westridg e HOA	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-Sna-DR3	38.9338	- 77.3231	Fairfax (county)	Snaked en Branch	Twin Branches Rd and Barton	Reston Associati on	Stream Health Assess ment,	Twice Per Year	Benthic macroinvert ebrates, temperature

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09-PL29-Sou- POH14	38.7431	-77.275	Fairfax (county)	South Run	Where the stream intersect s Mercer Lake N Trail behind Oak Stream Ct	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
09-PL22-Dif- Difficult Run - DR34	38.9717 7	- 77.2697 9	Fairfax (county)	Difficult Run	Where the river crosses 683	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
DR12	38.9186 86	- 77.2630 73	Fairfax (county)	Wolftrap Stream	Between Talisman Drive and Ridge Lane	Northern Virginia SWCD	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on	Twice Per Year	Benthic macroinvert ebrates, temperature
17-PL22-Wtrap- DR39	38.9021 88 38.7841	- 77.2619 - 77.2542	Fairfax (county) Fairfax	Wolftrap Creek Pohick	145 Park St, Vienna, VA 22180 On Pohick	Northern Virginia SWCD NVSWC	General Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng, Advoca cy, CMC Integrati on General Stream	Twice Per Year Twice Per	Benthic macroinvert ebrates, temperature Benthic macroinvert
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		1			Orange	1	Stream		
		İ			Hunt		Health		
		İ			Estates		Assess		
		1			Park and	1	ment,		Benthic
		l ₋			Hidden	Northern	Public	Twice	macroinvert
	38.7712	77.2407	Fairfax	Pohick	Pod	Virginia	Educati	Per	ebrates,
POH3	82	95	(county)	Creek	Nature	SWCD	on,	Year	temperature
			i (COUIILV)	LOICCK	INGLUIE	1 30000	I UII,	ı ı c ai	i tellipelatule l

			r	January		1		1	
					Center		Pollutio		
					where		n		
					the		Screeni		
					stream		ng,		
1							Advoca		
					crosses				
					the trail		cy,		
							CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n		
							Screeni		
							ng,		
1					Adjacent		Advoca		
					to local				Benthic
						Niagob -	CV,	Total	
1		l -			pool and	Northern	CMC	Twice	macroinvert
19-PL30-Acc-	38.8848	77.2360	Fairfax	Long	parking	Virginia	Integrati	Per	ebrates,
ACC20	8	4	(county)	Branch	lot	SWCD	on	Year	temperature
	1	1	\ 				General		,
1									
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
						Fui a sa al a			
						Friends	n		
						of	Screeni		
						Accotink	ng,		
					Behind	Creek,	Advoca		
					Kings	Friends			Benthic
							cy,	- .	
					Glen	of Lake	CMC	Twice	macroinvert
			Fairfax	Accotink	Elementa	Accotink	Integrati	Per	ebrates,
ACC14	38.8046	-77.232	(county)	Creek	ry School	Park	on	Year	temperature
7.0011	00.00.0		(000)	O.OO.	.,		General		tomporataro
							Stream		
							Health		
							Assess		
					Just west		ment,		
1				1			Public	1	
1					of where				
					Middle		Educati		
1					Run runs		on,		
					into		Pollutio		
					Pohick		n		
1									
					Creek,		Screeni		
					between		ng,		
1					Samos		Advoca		
					Ct and		cy,		Benthic
							CMC	Twice	
1			l _	l 	Charis				macroinvert
1	38.7433	77.2251	Fairfax	Pohick	Landing	NVSWC	Integrati	Per	ebrates,
F2-PC-16			/ · · · · · · · · · · · · · · · · ·	Creek	Ct	D	on	Year	temperature
121010	46	01	(county)	Olock					
121010		01	(county)	Orock			General		
121010		01	(county)	Orock			General		
121010		01	(county)	Orecit			Stream		
121010		01	(county)	Oreck			Stream Health		
121010		01	(county)	Oreck			Stream		
121010		01	(county)	Orock			Stream Health Assess		
121010		01	(county)	Order			Stream Health Assess ment,		
121010		01	(county)	Clock			Stream Health Assess ment, Public		
121010		01	(county)	Crook			Stream Health Assess ment, Public Educati		
121010		01	(county)	Crook			Stream Health Assess ment, Public		
121010		01	(county)	Ciscin	South		Stream Health Assess ment, Public Educati on,		
121010		01	(county)	Ciscin	South end of		Stream Health Assess ment, Public Educati on, Pollutio		Renthic
121010		01	(county)	Order	end of		Stream Health Assess ment, Public Educati on, Pollutio n	T. de c	Benthic
	46	-			end of Mill		Stream Health Assess ment, Public Educati on, Pollutio n Screeni	Twice	macroinvert
09-PL30-Acc-		- 77.2214	Fairfax	Accotink	end of		Stream Health Assess ment, Public Educati on, Pollutio n Screeni ng,	Twice Per	
	46	-			end of Mill	VASOS	Stream Health Assess ment, Public Educati on, Pollutio n Screeni		macroinvert

				January	2024				
							cy,		
							CMC		
							Integrati		
							on General		
							Stream		
							Health		
							Assess		
							ment,		
					Where		Public		
					Rocky		Educati		
					Branch,		on,		
					South		Pollutio		
					Run, and		n O		
					Gerry Connolly		Screeni ng,		
					Cross		Advoca		
				Rocky	Country		cy,		Benthic
		-		Branch -	Trail		CMC	Twice	macroinvert
	38.7197	77.2205	Fairfax	Pohick	come	NVSWC	Integrati	Per	ebrates,
F2-PC-18	14	65	(county)	Creek	together	D	on	Year	temperature
							General		
							Stream		
							Health Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					200 feet		n Screeni		
					north of		ng,		
					where		Advoca		
					the creek		cy,		Benthic
					hits	Northern	CMC	Twice	macroinvert
09-PL29-Poh-			Fairfax	Pohick	Pohick	Virginia	Integrati	Per	ebrates,
POH2	38.7234	-77.215	(county)	Creek	Rd	SWCD	on	Year	temperature
							General Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					l t		Pollutio		
					Just South of		n Screeni		
					7321		ng,		
					Brad St,		Advoca		
					Falls		су,		Benthic
	00.5==:	-	- · ·	l	Church,		CMC	Twice	macroinvert
Holmes Run Hunt	38.8554	77.1987	Fairfax	Holmes	VA	\/ACOC	Integrati	Per	ebrates,
1	35	13	(county)	Run	22042	VASOS	on General	Year	temperature
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on, Pollutio		
					South of		n		
					Annandal		Screeni		
					e Rd		ng,		
					between		Advoca		
					Hockett		cy,	l _ .	Benthic
00 DI 26 Ucl			Foirfor	Llolm	St and	Northern	CMC	Twice	macroinvert
09-PL26-Hol- Holmes Run 2	38.8526	- 77.1959	Fairfax (county)	Holmes Run	Putnam St	Virginia SWCD	Integrati on	Per Year	ebrates, temperature
Dead Run -	38.9418	-	Fairfax	Dead	In	Individual	General	Twice	Benthic
2000 Kuii	00.0710	Ī	i airian	Dodu	***	mairidual	Joniolai	1 11100	201101110

Г		1	1	January		1		r _	,
McLean	02	77.1859		Run	McLean		Stream	Per	macroinvert
		68			Central		Health	Year	ebrates,
Central Park					Park just		Assess		temperature
					upstream		ment,		
					of the		Public		
							Educati		
							on,		
					footbridg		Pollutio		
					е		n		
							Screeni		
							ng,		
							Advoca		
							cy, CMC		
							Integrati		
							on		
							General		
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
							n 0		
					6637 Old		Screeni		
							ng,		
					Chesterb rook Rd,		Advoca		Benthic
		_			McLean,	Northern	cy, CMC	Twice	macroinvert
19-PL24-Pim-	38.9236	77.1719	Fairfax	Pimmit	VA	Virginia	Integrati	Per	ebrates,
PIM7	82	47	(county)	Run	22101	SWCD	on	Year	temperature
			(0.0 0)				General		тоттротополо
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
							Pollutio		
					In Casas		n Canadani		
					In Green		Screeni		
					Spring Gardens		ng, Advoca		
					just east		Cy,		Benthic
		_			of the	Northern	CMC	Twice	macroinvert
18-PL26-Cam-	38.8251	77.1556	Fairfax	Turkeyc	two	Virginia	Integrati	Per	ebrates,
Cam 2	17	86	(county)	ock Run	ponds	SWCD	on	Year	temperature
			` '/				General		,
							Stream		
							Health		
							Assess		
							ment,		
							Public		
							Educati		
							on,		
					At the		Pollutio		
					At the Potomac		n Screeni		
					School,				
					500 feet		ng, Advoca		
					north of		cy,		Benthic
		_			the end	The	CMC	Twice	macroinvert
	38.9333	77.1555	Fairfax	Pimmit	of Hardy	Potomac	Integrati	Per	ebrates,
F2-PR-01	906	743	(county)	Run	Dr	School	on	Year	temperature
			, ,,		North of		General		
					6218		Stream		
	i	1	Ì		Hardy		Health		Benthic
					Dr,	The	Assess	Twice	macroinvert
F2-PR-02	38.9336	- 77.1533	Fairfax (county)	Pimmit Run		The Potomac School	Assess ment, Public	Twice Per Year	macroinvert ebrates, temperature

			1	January		,		1	,
					22101		Educati		
							on, Pollutio		
							n		
							Screeni		
							ng,		
							Advoca		
							су,		
							CMC		
							Integrati		
							on		
							General Stream		
							Health		
							Assess		
							ment,		
							Public		
					where		Educati		
					Holmes		on,		
					Run		Pollutio		
					crosses Holmes		n Screeni		
					Run trail		ng,		
					between		Advoca		
					Parkhill		су,		Benthic
					Dr and	Northern	CMC	Twice	macroinvert
09-PL26-Hol-		-	Fairfax	Holmes	Carey	Virginia	Integrati	Per	ebrates,
Holmes Run - 3	38.8404	77.1417	(county)	Run	Park Ln	SWCD	on	Year	temperature
					The		General		
					The monitorin		Stream Health		
					g site is		Assess		
					beside a		ment,		
					heavily		Public		
					travelled		Educati		
					road		on,		
					(Telegra		Pollutio		
					ph		n		
					Rd.)and		Screeni		
					Jefferson Manor		ng, Advoca		
					Park		cy,		Benthic
15-PL26-Cam-		_			borders	Northern	CMC	Twice	macroinvert
Cameron Run-	38.7929	77.0835	Fairfax	Pike	the other	Virginia	Integrati	Per	ebrates,
Cam1	67	27	(county)	Branch	side.	SWCD	on	Year	temperature
							General		
							Stream		
							Health		
							Assess		
							ment, Public		
						1	Educati		
							on,		
							Pollutio		
							n		
					Behind	1	Screeni		
					First		ng,		
					Baptist		Advoca		Danthi
					Church		cy, CMC	Twice	Benthic
		_	Alexandri	Taylor	of Alexandri		Integrati	Per	macroinvert ebrates,
TAYRUN1.5	38.819	77.0791	a (city)	Run	a	NRCA	on	Year	temperature
	22.0.0		\) /		Farmers		General		
					Branch		Stream		
					Creek is		Health		
					located		Assess		
					on	1	ment,		
					property	1	Public		
					owned		Educati on,		Benthic
	1	1		Farmers	by Brad	1	Pollutio	Twice	macroinvert
		_							
	36,4059	- 81.1378				Preserve			
G5-FBC-01	36.4059 452	81.1378 457	Grayson	Branch Creek	Nester and is a	Preserve Grayson	n Screeni	Per Year	ebrates, temperature

•		1	1	January		1		1	1
					tributary		ng,		
					of Peach		Advoca		
					Bottom		cy,		
					creek.		CMC		
					Located		Integrati		
					near		on		
					0050				
					2358				
					Surgar				
					Camp				
					Road.				
					844				
					Dolinger		General		
					Road,		Stream		
					White		Health		
					Тор,		Assess		
					between		ment,		
					bridge		Public		
							Educati		
					to		on,		
					residenc		Pollutio		
					e and		n		
					down		Screeni		
					stream 3		ng,		
					board		Advoca		
					fence.		cy,	l _ .	Benthic
		-		White	Ronald		CMC	Twice	macroinvert
05 14/50 004	36.3593	81.3619		Тор	Richards	Preserve	Integrati	Per	ebrates,
G5-WTC-001	404	324	Grayson	Creek	on	Grayson	on	Year	temperature
					Go to				
					844				
					Dolinger				
					Road,				
					White				
					Top,conti				
					nue				
					further				
					down the				
					road and				
					4				
					turn				
					right on				
					the next				
					hard top		0		
					road. Cross		General Stream		
					bridge		Health		
					and immediat		Assess		
					ely turn		ment, Public		
							Educati		
					right		on,		
					on		Pollutio		
					small dirt		n		
				White	follow for		n Screeni		
				Top	about				
				Creek	1000		ng, Advoca		
				Unname	feet,				Benthic
		_		d	small		cy, CMC	Twice	macroinvert
	36.3578	81.3640		Tributar	stream	Preserve	Integrati	Per	ebrates,
G5-WTCUT-001	557	35	Grayson	V	on left.	Grayson	on	Year	temperature
30 001 001			2.0,0011	J	5	2.2,0011	General		
					In		Stream		
					Andrew		Health		
					Leitch		Assess		
					Park		ment,		
	38.6455	<u> </u>			behind		Public		
	56	77.3469			Ruler Ct,		Educati		
		44			riffle right		on,		
					downstre		Pollutio		Benthic
					am of the		n	Twice	macroinvert
Nebasco Creek			Prince	Nebasc	footpath		Screeni	Per	ebrates,
(Ruler Ct. 1)			William	o Creek	bridge.	GMU	ng,	Year	temperature

	1	1	1	January	/ 2024	1		1	1
							Advoca cy,		
							CMC		
							Integrati		
							on General		
							Stream		
							Health		
							Assess ment,		
							Public		
					West on		Educati		
	38.9038	77.3750			Southfiel d Dr, Left		on, Pollutio		
	89	00			on		n		
					Searsmo nt Pl,		Screeni ng,		
					111.11,		Advoca		
				1.201	follow		cy,		Benthic
				Little Difficult	path 1/4 mile to	NVSWC	CMC Integrati	Twice Per	macroinvert ebrates,
DR22			Fairfax	Run	creek	D	on	Year	temperature
							General		
							Stream Health		
							Assess		
					Access		ment, Public		
					site		Educati		
	38.8120	-			through		on,		
	1	78.5574 7			two fields,		Pollutio n		
		'			enter		Screeni		
					stream		ng,		
				North Fork	directly		Advoca cy,		Benthic
				Shenan	at bottom		CMC	Twice	macroinvert
C2 NEC 47			Shenand	doah	of small	ENECD	Integrati	Per	ebrates,
S3-NFS-17			oah	River	hill.	FNFSR	on General	Year	temperature
							Stream		
							Health Assess		
					Located		ment,		
					at		Public Educati		
	07.4044	_			eastern edge of		on,		
	37.1611 11	79.9416			Mariners		Pollutio		
		67			Landing		n Screeni		
							ng,		
					develop		Advoca		Ronthio
					ment upstream	Craddock	cy, CMC	Twice	Benthic macroinvert
Do 05 51				Craddoc	from ma	Creek	Integrati	Per	ebrates,
B3-CC-01			Bedford	k Creek	rina	Team	on General	Year	temperature
							Stream		
							Health		
							Assess ment,		
							Public		
							Educati on,		
					In	Friends	Pollutio		
					Country	of	n		
					Club Hills Common	Accotink Creek,	Screeni ng,		
					s behind	Country	Advoca		
					Fairfax	Club Hills Civic	cy, CMC	Turico	Benthic
	38.8608	- 77.2925	Fairfax	Accotink	City Fire Station	Associati	Integrati	Twice Per	macroinvert ebrates,
F2-ACC-21	94	41	(city)	Creek	33	on	on	Year	temperature

*New sites may be added as additional volunteers become certified.