Planning Your Monitoring Strategy (**The Study Design**)

This document provides summary information designed help you organize your monitoring plan. Before deciding to begin a monitoring and/or restoration project it is very important for you to describe your study design; click-here for an example. Think carefully about the why, what, where, when and how questions, and consider the quality assurance and quality control (QAQC) measures that are necessary to insure accuracy and precision. Your approach should be similar to the scientific method. The questions you ask, the methods you choose, and the way the data is analyzed and checked should be written into your study design. It's worth taking the time to figure out what you want to do. Your monitoring is much more likely to be successful and sustainable over a longer time, with the right plan. Note: You can submit a draft-document to the WV Save Our Streams Coordinator or your local Nonpoint program Basin Coordinator. These persons can provide assistance and help you develop your plan. Below is a summary of the steps in the study design process.

Contents

Organize your technical committee

1. List the members of your technical committee and their expertise.
   - Write a job description that describes the roles and responsibilities of the technical committee members.

Why are you monitoring?

1. Provide background information on your stream: For example, describe the geography of your stream, where it begins, where it joins larger water bodies and other important characteristics of its watershed.
2. List (or put on a map) the classifications, designated uses or other ecological values associated with your stream.
3. Describe the issues facing your stream posed by the threats or conflicts and what, if anything is being done to address them?
   - List the stream segments that do not support, or only partially support, their designated uses
   - List the stream segments that do not support, or only partially support, their designated uses.
   - List the threats, causes or reasons that specific stream segments do not support their designated uses.
   - List the protection or restoration efforts underway to address the problems.
   - List the information that you believe you will need in order to address the issues.
   - What type of information will you need to define and evaluate the extent of the problems?
   - What type(s) of information will you need to define and evaluate effective solutions?
4. List the specific questions you will try to answer through stream monitoring.

What will you monitor?

1. List the indicators you will use to monitor your stream.
2. Describe the significances of each indicator and how they will help answer your questions.

1 http://www.dep.wv.gov/WWE/getinvolved/sos/Pages/Studydesign.aspx

What are your data quality objectives requirements?

1. List the intended uses and users of your information.
2. List your data quality objectives.
3. List your data quality requirements of the sampling and analysis of each indicator:
   - Accuracy is how close are your results are to the true values.
   - Precision is how close are your results, through repeated analysis of the same sample, to each other.
   - Sensitivity is the smallest change or lowest concentration you seek to detect.

How will you monitor?

1. Describe how you will collect your samples.
   - What will be sampled (e.g. the water, bottom sediment, aquatic life etc.)?
   - List the types of sampling containers and/or other equipment and devices to be used.
   - What quantity of sample(s) will be collected?
   - How many samples will your monitoring team collect at each location?
   - Provide a description of your procedures (reference a particular method if applicable).
2. Describe how you will analyze the samples.
   - How will the samples be transported to the lab (if applicable), and what is your chain of custody procedures?
   - How soon after collection will your samples be analyzed?
   - What method(s) will be used to analyze the samples: If you plan to use specific analytical methods, cite the method(s); EPA Method 360.2; or you may choose to adopt a specific program's standard operating procedures. In that case you would cite the program's standard operating procedures (SOPs) manual.
   - Provide a complete description of your procedures.
   - Make sure to include the units will your results be reported in.

Where will you monitor?

1. List the criteria you used to select sampling sites.
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3. List each sampling site and the rationale for each one. This could be a table with the following column heading:
   - Site "station" Number and/or name.
   - How the site be sampled (e.g. wading, from shore, by boat etc.).
   - Why the site is being monitored.
4. List where each indicator will be analyzed (field or lab etc.).

When will you monitor?

1. List the sampling and analysis dates for each type of sampling.
2. List the time of day each sample will be taken.
3. List the holding times for each type of sample.
4. Define your index period, if collecting benthic macroinvertebrates.

Who will monitor?

1. List the paid and volunteer positions.
   - Title
   - Responsibilities
   - Name, address, phone number, e-mail etc.

What are your quality assurance and quality control measures?

1. List the quality assurance and quality control (QAQC) measures you will use:
   - Internal checks

- External checks

2. Describe each one and how it will be carried out (be very specific and cite all reference materials and methods in an appendix section)

The QAQC of your data is often the most important aspect of your monitoring strategy. In many cases a separate QAPP (Quality Assurance Project Plan) document should be written to describe your internal and external control procedures. The QAPP integrates all technical and quality aspects of a project, including planning, implementation, and assessment. The purpose of the QAPP is to document planning results for environmental data operations and to provide a project-specific "blueprint" for obtaining the type and quality of environmental data needed for a specific decision or use. The QAPP document describes how QAQC procedures are applied to an environmental data operation to assure that the results obtained are of the type and quality needed and expected. For more information refer to EPA Requirements for Quality Assurance Project Plans (EPA QA/R5). This is a 40-page manual that describes the specifications for QAPP preparation, for activities conducted by or funded by EPA.

Put your plan in writing and review it annually

- The members of your technical committee should complete the annual review with input from others, especially field personnel.

For more information write to the WV Save Our Streams Program at the mailing address below, or E-mail the Coordinator. **Click-here** to review guidelines for submitting water quality data

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