

## **Program background and scope statement**

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The program is a comprehensive stream monitoring and restoration program. The program includes analyses of pollution problems in a watershed, water quality monitoring using a biological approach and stream restoration projects such as litter cleanups, tree planting, installation of BMP's and other conservation projects.

The biological monitoring component of this program is taken from the national Save Our Streams Program, which was modified in June 1988 to incorporate a new method, which was devised by Ohio state biologists in 1985. Ohio used the Save Our Streams model to devise their new method of monitoring which uses a kick-seine to trap stream macroinvertebrates, which are then identified to the family or order level. The stream survey incorporates species diversity and pollution tolerance indices for organisms to determine water quality. The monitoring methods are consistent throughout the levels of training, however incorporating a wider variety of metrics at intermediate and advanced levels provide a more thorough analysis.

The above biomonitoring techniques or a modified version thereof will be used in the West Virginia Monitoring Program. The program's purpose is to aid state agencies in gathering more data of streams not previously monitored in West Virginia. Areas where unknown problems exist or where degradation is occurring over time are identified for agency personnel. Many streams suffering the impact of nonpoint source pollution have never previously been monitored.

The program will collect data on streams previously not monitored by the state to increase the amount of data on water quality, especially in areas degraded by nonpoint sources. This data can then be compared either to other databases including Division of Natural Resources evaluations of typical macroinvertebrate population numbers, data collected by the Watershed Assessment Branch of the Division of Water Resources or other data collected at that particular monitoring site or other sites within the watershed.

Another equally important purpose of the monitoring program is to educate West Virginia citizens on the need to protect rivers from pollution and to demonstrate the unique sensitive ecosystems dependent on wise use of our river and land resources.

## **Monitoring network design and rationale**

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The program as the approach for a citizen-based monitoring program chose biological monitoring because:

1. The Biological monitoring technique provides a simple, accurate and easy-to-understand method for determining if a stream has been affected by a pollution source.
2. Biological monitoring has been identified by the United States EPA Nonpoint Sources Branch in their 1989 report "Nonpoint Source Agenda for the Future" as the best way to test for the impacts of nonpoint source pollution. In attempting to measure the impact of nonpoint source pollution, the question of whether or not a river has been degraded needs to be answered. Biomonitoring can determine if a river has been degraded and accounts for chemical as well as physical pollution, such as excessive siltation.
3. Biological monitoring provides a more practical and reliable approach for volunteer water-quality

testing. There is less chance of incorrectly performed testing since the biological approach is far simpler, there is no transport or storage of the collected sample required, and no laboratory is needed for the level of biomonitoring performed in the program. Biomonitoring provides information on the quality of a particular river segment and does not require repeated, constant or round-the-clock testing as is required in chemical monitoring. In addition, the simple types of chemical tests that the average citizen is able to perform may not reveal contamination of a river by serious toxic pollutants. In addition, a lab with sophisticated equipment is needed to test for most toxic chemicals whereas monitoring of a stream's biota can be completed accurately on site with little equipment. Biological monitoring provides information on the quality of a river over an extended period of time. Biological monitoring can also reveal definite pollution effects, even if the source of this pollution is not readily apparent. Kick-seine net sampling has also been shown to provide good statistical replication (Pollard 1981).

4. Biological monitoring is a method, which allows the average citizen to participate in actual analyses of a stream's health rather than just collection of a water sample. Biological monitoring has been found to provide a fun hands-on and inexpensive approach to water quality monitoring and pollution problem identification.