Washington State Conservation Commission

VSP

# Monitoring Tips for Local Voluntary Stewardship Workgroups

*Provided by VSP Technical Panel agencies*

The Voluntary Stewardship Program (VSP) requires local watershed groups to create a work plan to protect critical areas while maintaining the viability of agriculture in the watershed.[1] It also requires that VSP work plans establish baseline monitoring for participation activities and implementation of the voluntary stewardship plan and projects, stewardship activities, and the effects on critical areas and agriculture relevant to the protection and enhancement benchmarks developed for the watershed.[2] Further, the VSP work group, in the work plan, must assist state agencies in their monitoring programs.[3]

However, a county that has opted into the VSP is not required to implement it in a participating watershed until adequate funding for it in that watershed is provided to the county.[4] Furthermore, state agencies conducting new monitoring to implement the VSP in a watershed must focus on the goals and benchmarks of the work group's work plan.[5]

To assist watershed groups in the task of identifying measurable programmatic and implementation goals and benchmarks, the WA Departments of Ecology, Agriculture, Fish and Wildlife and the WA Conservation Commission developed the following tool: Monitoring Tips for Local Voluntary Stewardship Workgroups. A companion resource table is also being developed.

**Monitoring Tips For Voluntary Stewardship Workgroups:** Washington State invests substantial resources and expertise in monitoring the health of Washington's ecosystems including: species presence, species population size, impacts and prevalence of disease, structure of landscapes, water temperature, water quantity, groundwater status, and aquatic life and habitat monitoring. This investment is critical to understanding how management actions are impacting on-the-ground conditions such that we can respond to negative outcomes before there are impacts to the economy, citizen's health, safety and quality of life. We would like to provide some of the lessons we have learned to the watershed groups in the hopes that they can learn from our past mistakes and provide effective monitoring as part of the Voluntary Stewardship Program.

There are several pitfalls to consider when you are beginning to set up monitoring.

**Pitfall 1:** Not clearly stating the monitoring questions – What do you want to know?

[1] RCW 36.70A.720
[2] RCW 36.70A.720(1)(i)
[3] RCW 36.70A.720(1)(k)
[4] RCW 36.70A.710(9)
[5] RCW 36.70A.705(5)

**Pitfall 2:** If you have successfully described your monitoring questions, then the second pitfall to avoid is gathering the wrong information. To put it another way, the information gathered does not inform your question. This may occur for a variety of reasons including: wrong type of data, wrong place, wrong scale, wrong scope.

**Pitfall 3:** The last pitfall is less obvious to the non-scientific type than the first two. Pitfall three occurs when you have identified the right questions, the correct scale scope and measure for study, but do not have enough samples to demonstrate a change statistically when in fact there was a change. Science calls the ability to detect change from data as the "power." Be sure that you have adequate power to know if change has occurred.

**Theme 1: Monitoring is expensive – be selective**

- Focus monitoring on aspects of the critical areas that you expect change with enhancements or protection.
    - Sample in a representative manner, such as a probabilistic design or a complete inventory for the areas/parameters of concern.
    - Additional considerations: Identify the suite of actions you expect to generate change and monitor those actions and the hypothesized changes. If you are concerned about upstream sources, bracket-monitor the area of concern to subtract out upstream sources in the data analyses.
- Focus monitoring where likelihood of loss to the viability of agriculture or the health of the critical area is perceived as high
    - Example: Monitor the amount of agricultural land base that changes due to changes in riparian areas if this is a key concern. If a key concern is the loss of sage grouse habitat due to agriculture, then monitor number of acres of sage grouse that were converted to agriculture.
- Monitor key parameters or their surrogates.
    - Critical areas are defined as: wetlands, critical fish and wildlife habitat, critical aquifer recharge areas, frequently flooded areas, and geologic hazard zones. These should be included in a monitoring plan if such areas are in your basin.
    - Surrogate parameters could include: riparian and/or instream habitat (woody debris, channel morphology, macroinvertebrates, sediment parameters) as a subsection of critical fish and wildlife habitat, groundwater monitoring including quality and levels for critical aquifer recharge areas, and sediment parameters for geologic hazard zones.
- Consider surrogates that may be less expensive but provide similar information, but consider the pros and cons of each
    - Example: Amount of shade vs stream temperature. Using simple hand-held densitometers provides good information about shade at a location or along a reach, whereas stream temperature loggers ($$) won't likely detect any but the largest changes in water temperature unless the restored riparian reach is long. Riparian shade is something that you can directly do something about (see next); stream

temperature is more difficult. On the flip side however, more factors other than riparian shade affect temperature (sedimentation causing greater width:depth relationships and streamflow). If you rely only on shade as a surrogate, you might overlook other causes. Also, water temperature is already measured in many streams across the state, and those measurements could be leveraged at no cost.

- Alternately, amount of riparian canopy cover could be analyzed using imagery.
- Surface water quality is not an adequate surrogate for groundwater.
- Lastly, a surrogate with lower variability will be cheaper to monitor since fewer samples will be required. Nutrients are typically less variable than fecal coliform bacteria for example, yet both may answer questions about pollution from animal waste. Sediment is a high value surrogate, as it carries many pollutants, impacts critical habitat, and some believe it can be used for geologic hazard inputs into stream.

- Monitor actions that provide direction on what to do better.
  - Example: Shade, sediment, wetland quantification, groundwater monitoring.

## Theme 2: Easy and transparent replication is critical

- Create baselines with methods that are easy to do again and again, and that require the least amount of subjective analysis by the technician performing the analysis.
- Describe the methods with great detail, including the appropriate statistical analysis if they are used, such that someone far in the future can do exactly what you did. Using a Quality Assurance Project Plan (QAPP) template provided by EPA or the Department of Ecology can be useful to follow because within the template are all of the appropriate categories that should be documented.

| | **Goal** | **Adaptive Management Objective** | **Performance Metric** | **Monitoring Method** | **Adaptive Management Action Threshold** | **Adaptive Management Action** | **Who Monitors** | **When** | **Party Responsible for Action** |
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| **Definition** | High level goal as described in watershed plan | Specific environmental conditions desired from project | What will be measured to know if adaptive management objective is achieved | How the performance metric will be measured | Project result that, if achieved, must be addressed with an action | Action that will be taken if threshold is reached | Person or organization responsible for adaptive management objective monitoring | When monitoring will occur | Person or organization responsible for implementing adaptive management action including all elements of contracting and fiscal responsibility if threshold is reached. |
| **Examples** | Protect fish and wildlife populations and their associated habitats | Maintain riparian vegetation along waterbodies | : % cover of natural vegetation (tree and shrub) remains unchanged between 2011 - 2020 in riparian area | Sample areas using aerial photography and site visits or use WDFW High Res Change Detection | % of riparian area change | Survey property owners along stream to determine % of participation in stewardship | Conservation District | Every 5 years | Conservation District and participating land owners |

**Theme 3: Adaptive management involves setting triggers for change**

- Identify triggers that will precipitate adaptive management action.
- Identify when new information will be reviewed, who will review information and which decisions will be modified by the new information, if warranted.
- Ensure that adaptive management monitoring provides the level of detail expected by decision makers to answer their questions and that decision makers understand the cost (and effort) of the answering the question.
- As a corollary, don't "over-monitor"; i.e. don't monitor robustly enough to detect a 1% difference if the adaptive management threshold is a 10% difference.
- Determine who will pay for monitoring, who will perform monitoring and when the monitoring will occur.
- Describe the adaptive management actions and or processes that will result from hitting the trigger.

Example of Monitoring and Adaptive Management Template

**Available Expertise:**

Department of Ecology Environmental Assessment Program:

- Groundwater monitoring, including levels and quality
- Instream habitat monitoring, all typical parameters including macroinvertebrates, wood, width:depth and many others
- Sediment monitoring in water column and streambed
- Water quality
- Streamflow
- Laboratory analysis of parameters (accredited)
- QAPP and Standard Operating Procedure (SOP) development for documentation, study design assistance, and repeatability
- Toxics
- Telemetry of continuous water quality and streamflow data