

TOOLBOX 6



MONITORING FOR SUCCESS

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TABLE OF CONTENTS

Introduction	6-3
What is Monitoring for Success.....	6-3
Why Monitor for Success.....	6-3
The Process of Monitoring for Success.....	6-3
Step 1. Determine Intermediate Indicators and Milestones.....	6-4
Step 2. Provide a Mechanism for Ongoing Watershed Assessment	6-5
Step 3. Build a Case for Action Based on Impacts	6-5
Step 4. Monitor Restoration and Protection Efforts	6-6
Step 5. Review and Evaluate the Watershed Management Plan and Revise if Necessary	6-6
Helpful Resources	6-7

TOOLBOX 6 - MONITORING FOR SUCCESS

SELF EVALUATION

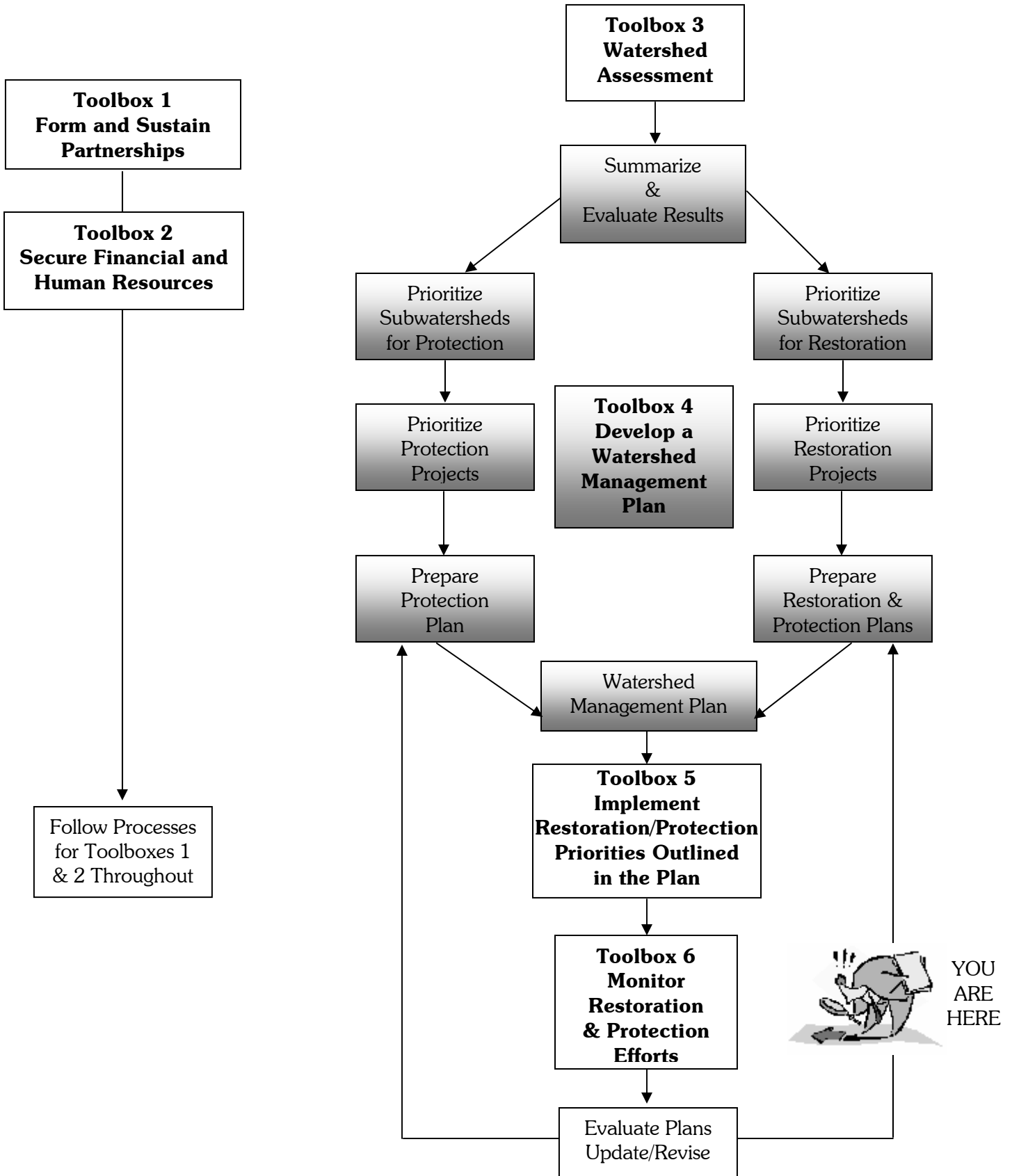
Please complete the following selfevaluation to determine if there are areas for improvement or if you are ready to revisit your comprehensive watershed management planning.

1. Have you determined intermediate indicators and milestones?
2. Do your intermediate indicators and milestones highlight interim achievements?
3. Do your intermediate indicators and milestones show that a specific goal or objective has reached a certain stage?
4. Does your plan include remedial actions if intermediate indicators and milestones are not achieved?
5. Does your plan include monitoring of any physical, chemical, biological, hydrological, geomorphological, habitat, social or organizational indicators that are relevant to your goals and objectives?
6. Have you set up regular evaluations to help detect early on whether your efforts are producing the intended results?
7. Do you have a set of evaluation questions to help your group make systematic corrections or modifications?
8. Does your plan include detailed scenarios that establish potential future courses of action?
9. Does your group regularly review and update the plan?
10. Does your plan allow for the use of innovative or experimental strategies even if they were not in the original plan?

If you answered YES to all ten questions you do not need Toolbox 6.

If you answered NO to any of the questions, you may want to visit toolbox 6 for suggestions.

Comprehensive Watershed Management Planning Process



TOOLBOX 6

MONITORING FOR SUCCESS

Introduction

This toolbox provides general information about monitoring the success of your watershed management plan and implementation. **Monitoring for success is the sixth and final step in comprehensive watershed management planning and is closely related to the goals for success you established using Toolbox 4 to develop your watershed management plan.**

What Is Monitoring for Success?

In this step you will establish indicators and milestones to evaluate and quantify the progress you are making in meeting the goals of your watershed management plan. A key step in watershed protection is determining when you have achieved your goals and objectives. This involves developing appropriate indicators to evaluate the progress of the watershed efforts, as well as conducting monitoring to measure improvements in the watershed.

Why Monitor for Success?

The reason for this element is to determine how successful your watershed management plan has been in meeting your vision and goals for your watershed. This allows you to periodically update the plan to reflect the changes identified through the analysis of your monitoring results and whether or not your goals for success (benchmarks) have been met.

The Process of Monitoring For Success

Monitoring for success follows a simple process that includes the following activities:

1. Determine intermediate indicators and milestones.
2. Provide a mechanism for ongoing watershed assessment.
3. Build a case for action based on impacts.
4. Monitor restoration and protection efforts.
5. Review and evaluate the watershed management plan and revise if necessary.

This document will describe each step in this process and provide helpful resources you can access to aid in the completion of your watershed assessment. By taking a little time to follow this process, you will increase the chances that your efforts will have valuable results.

STEP 1: DETERMINE INTERMEDIATE INDICATORS AND MILESTONES.

These indicators and milestones are an important part of monitoring for success. They are in-process evaluation points that highlight interim achievements (i.e., a decrease in stream bank erosion or number of miles of cleanup performed) and indicate that a goal or objective has reached a certain stage (i.e., 20 percent decrease in stream bank erosion throughout the watershed).

Watersheds are very complicated systems of inter-related physical, chemical, biological, hydrological, geomorphological, habitat and social characteristics often referred to as “indicators”. Which indicators you choose to monitor will depend upon the goals and benchmarks you set in your watershed management plan. **(See Toolbox 4: Developing the Watershed Management Plan)**

There are literally hundreds of indicators you could measure and use in developing milestones. Here are some broad categories with descriptions:

- **Physical** – This includes factors like water temperature, as well as water turbidity or the amount of sediment in the streams and lakes of your watershed.
- **Chemical** – This includes factors like pH, dissolved oxygen, alkalinity, nutrients and other elements and compounds found in the streams and lakes of your watershed.
- **Biological** - This includes living things like bacteria, fish, insects, plants and other living things in your watershed.
- **Hydrological** – This includes all the factors that affect the amount of water in your watershed such as land use, precipitation, runoff, groundwater and stream flow.
- **Geomorphological** – This includes all the factors that affect the stability of the streams within your watershed such as entrenchment, width/depth ratio, sinuosity, channel materials and slope.
- **Habitat** – This includes the physical structure of the stream channels, the shorelines, riparian areas, wetlands and beyond the water bodies to upland areas important to wildlife in your watershed.
- **Social** – This includes BMP performance, industrial site compliance, demographics and land use trends.
- **Organizational** - This includes number of members, miles of cleanup performed, past accomplishments and successes.

Partners should be involved in developing the indicators to be used and can also assist with monitoring efforts through volunteer monitoring programs.

The plan should include predetermined remedial actions in case intermediate indicators and milestones are not achieved.

Here's an example:

Big Tree Creek Watershed Plan

Goal 1: Restore water quality in Big Tree Creek by reducing sediment and nutrient load from non-point sources of pollution by 20 percent.

Objective 1: Establish riparian-forested buffers.

Strategy 1: Plant riparian-forested buffer that is 50 feet wide along 5,000 linear feet of Big Tree Creek by spring of 2005.

Interim Benchmark 1: Fifty percent of trees planted in buffer should survive at least two years after installation.

Intermediate Indicators and Milestones: Establish monitoring schedule to evaluate condition of buffer. Conduct monitoring and record those areas where buffer is not meeting 50 percent survival rate. Determine reasons for failure, address problems and replant. Continue in-stream water quality monitoring for sediment and nutrients until 20 percent goal is met.

STEP 2: PROVIDE A MECHANISM FOR ONGOING WATERSHED ASSESSMENT.

An effective watershed plan is not a report that can be developed and left unchanged over time. Watersheds are dynamic environmental systems that are in constant flux. A community's land uses are also constantly changing resulting in impacts to the watershed. As a result, the watershed plan should not only reflect community goals and objectives, but also include measures that evaluate the community's progress toward meeting those goals and objectives. For example, the plan should include ongoing monitoring of baseline conditions in the watershed. This may include monitoring of any physical, chemical, biological, hydrological, geomorphological, habitat and social and organizational indicators that are relevant to your goals and objectives for your watershed.

Regardless of the indicator scheme adopted, showing stakeholders how chemical, physical and biological parameters are used or incorporated into indices helps develop an appreciation for scientific and technical principles and processes. Linking indicators to water quality and habitat condition further aids this effort and is an important consideration in any assessment and monitoring program.

STEP 3: BUILD A CASE FOR ACTION BASED ON IMPACTS.

It is not uncommon for watershed groups to find that monitoring protection and restoration initiatives are not producing the intended results. It is likely that one of the following problems will occur:

- Monitoring indicates that conditions have not changed within the time period you specified.
- Solving one problem unmask another problem that is more difficult to address.

- The project reaches some program or activity goals but may not be effective enough to reach the water quality goals.
- Quantifiable objectives (e.g., pollutant load reduction) were set too low to solve the problem.

Regular evaluations can help to detect early on, whether your efforts are producing the intended results. It is not uncommon to shift your efforts or focus based on an evaluation of the effectiveness of your overall initiatives.

Evaluation questions that have helped other watershed groups make systematic corrections or modifications include:

- Are the correct controls/restoration measures being installed in the correct target areas first?
- Are they being installed correctly and on schedule?
- Do the controls appear effective?
- What visual evidence is there to support this?
- What do the water quality data show?
- How are the biological systems responding?
- Are all parties meeting commitments for time, funds, labor, and resources?

Measuring environmental success is not difficult, though often improvements occur many years after restoration and new management practices are implemented. Success indicators should be derived from the goals established by the partnership. Goals should be specific, measurable, attainable, relevant and time-sensitive.

STEP 4: MONITOR RESTORATION AND PROTECTION EFFORTS.

Monitoring restoration and protection efforts is key to understanding if project goals are met. For example, a plan could designate resources for educating developers about the voluntary use of low-impact development techniques to reduce storm water runoff and pollution. However, if monitoring indicates that pollution levels remain high and storm flows have not abated, the plan could stipulate the implementation of additional tools such as an updated storm water ordinance or storm water retrofits, to address the concerns. Because of the complexity of natural systems and changes in land use patterns over time, watershed planning should be understood as an iterative process that needs to be revisited and updated on a regular basis. Monitoring efforts pinpoint areas where changes are taking place and may indicate the need for watershed plan review and evaluation.

STEP 5: REVIEW AND EVALUATE THE WATERSHED MANAGEMENT PLAN AND REVISE IF NECESSARY.

An effective watershed plan should include a mechanism that allows for alterations and changes in the event that plan goals and objectives are not being met. For example, if periodic assessments indicate that water quality improvement goals have not been achieved, the situation should be

documented and corrective actions taken. To plan for these situations the watershed plan can include a series of detailed scenarios that establish potential future courses of action.

Watershed management is dynamic: conditions, priorities, resources, and capabilities can all change over time. Repeating the cycle provides an opportunity to update assessments, priorities, goals, and management strategies and address issues that were not dealt with during previous iterations because of resource constraints or other reasons. The process of moving cyclically through the planning and management steps and making constant adjustments is called adaptive management. This approach allows consideration and use of innovative and even experimental strategies and avoids the narrow-minded pursuit of activities just because they're in the plan.

Helpful Resources

1. Watershed Stewardship, A Learning Guide EM 8714

A thorough notebook that will guide your organization through Creating Successful Groups, Watershed Science and Monitoring and Evaluating, Managing and Improving Watersheds.

You can order this from:

Publication Orders

Extension & Station Communities
Oregon State University
422 Kerr Administration
Corvallis, OR 97331-2119
Phone: 541-737-0817

The cost is \$42.00

2. The Conservation Technology information Center (CTIC) at Purdue University has a large selection of materials to assist watershed organizations on a variety of topics. Many of the materials can be viewed at:

www.ctic.purdue.edu/Catalog/WatershedManagement.html#Guides

You can also use the address and phone number below for ordering:

The Conservation Technology Information Center
1220 Potter Drive, Rm. 170
West Lafayette, IN 47906
Phone: 317-494-9555
Fax: 317-494-5969

There is a cost for the materials.

- 3. Adopt-A-Buffer Toolkit:** Monitoring and Maintaining Restoration Projects. A version of this toolkit is available and can be downloaded free of charge at:
www.delawariverkeeper.org

You can also use the address below for ordering:

Delaware River Keeper Network

P.O. Box 326

Washington Crossing, PA 18977-0326

- 4. "Stream Corridor Assessment Survey - SCA Survey Protocols".** A pdf version of the manual is available at www.dnr.state.md.us/streams under "Monitoring and Research - Stream Corridor Assessment.
- 5. Canaan Valley Institute (CVI)** <http://canaanvi.org>
- 6. Western Pennsylvania Conservancy (WPC)** www.pa.conserve.org
- 7. Center for Watershed Protection** has a large selection of resources to assist watershed groups on a variety of topics. www.cwp.org

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