

Handbook TWO

Developing a multiparty monitoring plan



The multiparty monitoring handbook series

This multiparty monitoring handbook is part of a series of guides to monitoring collaborative forest restoration projects. The series was written specifically for projects funded through the USDA Forest Service's Collaborative Forest Restoration Program (CFRP). The Handbooks in the series are:

- Handbook 1*—What is multiparty monitoring?
- Handbook 2*—Developing a multiparty monitoring plan
- Handbook 3*—Budgeting for monitoring projects
- Handbook 4*—Monitoring ecological effects
- Handbook 5*—Monitoring social and economic effects
- Handbook 6*—Analyzing and interpreting monitoring data

Multiparty monitoring is required of all CFRP grantees; however, the methods and approaches presented in these workbooks are to serve as guides and references only. The specific methods are NOT required. Because there is a wide diversity of projects funded through the CFRP, many grantees will have different requirements for monitoring and/or monitoring assistance.

The content of these handbooks was largely conceived at a series of workshops held in 2003 that were sponsored by the following: Ecological Restoration Institute (ERI), Forest Trust, Four Corners Institute, National Forest Foundation, Pinchot Institute for Conservation, USDA Forest Service—Collaborative Forest Restoration Program.

These handbooks are updated periodically and the latest versions will be available on the Collaborative Forest Restoration Program Web site at www.fs.fed.us/r3/spf/cfrp/monitoring. For more information on this series, contact the [Ecological Restoration Institute](#), Box 15017, Flagstaff AZ 86011-5017.

CFRP grantees are also eligible for multiparty monitoring training workshops and technical assistance from the CFRP monitoring team. This free service will be provided through September 2006. Call 866.614.8424 for details.

Handbook series authors/editors: Tori Derr, Ann Moote, Melissa Savage, Martha Schumann, Jesse Abrams, Laura McCarthy, and Kimberly Lowe.

Design, copy-edit, and production Joel Viers, ERI; cover photo courtesy the Forest Guild.

01.06.05



This Handbook series is largely funded by the USDA Forest Service and is published by the Ecological Restoration Institute at Northern Arizona University

Table of contents

Why develop a monitoring plan?	1
What monitoring approach to use	2
What to monitor—choosing goals	3
What to monitor—choosing indicators	4
How to gather good data.	6
What is really doable?	8
A monitoring plan template	8
Glossary	10
Table 1 – Sample goals and indicators	5
Table 2 – Monitoring plan template	9
Acknowledgments	

Why develop a monitoring plan?

Developing a clear, concise plan for how monitoring will be done is an essential part of any monitoring program. A monitoring plan will help your group make sure that the data you gather are useful and meaningful. It ensures that information is collected at the right time and place and helps to provide transparency, an important part of the multiparty monitoring process.

Transparency means that anyone can access information and understand the goals, actions, and accomplishments of a project.

—
Transparency helps to build trust among people with different perspectives or values.

Your monitoring plan can be brief, but it should include these very basic elements of the monitoring program:

- What will be monitored?
- How will it be monitored?
- Who will do the monitoring?
- When does the monitoring need to be done?
- Where does the monitoring need to occur?
- Where will monitoring data be stored?
- How, when, and by whom will monitoring data be analyzed?
- How much will monitoring cost, and how will it be paid for?

This handbook covers the basic steps in designing a monitoring plan. You may want to refer to one or more of the other handbooks in this series when developing your monitoring plan.

Handbook 3 provides funding ideas and sample budgets
Handbook 4 describes ecological monitoring methods
Handbook 5 describes social and economic monitoring methods
Handbook 6 explains how to analyze and interpret monitoring data

What monitoring approach to use _____

Your multiparty monitoring group may want to consider whether it is interested in monitoring project implementation, monitoring project effectiveness, or validating project assumptions.

Implementation monitoring simply asks, “did we do what we said we would do?” Monitoring with this approach might answer the following sample questions: “Did our project provide jobs within the local community?” or “Did our project thin 125 acres of ponderosa pine forest?”

Effectiveness monitoring helps determine whether or not the project goals were achieved by asking the question, “Did it work?” Monitoring plans taking this approach might answer the following sample questions: “Did our project reduce the number of small trees that compete with old-growth ponderosa pine?” or “Did our project increase forage for deer?”

Validation monitoring involves checking the assumptions upon which restoration efforts are based. Monitoring with this approach usually shows causality and might answer the following sample question: “Did reducing crown cover actually reduce the threat of catastrophic wildfire?”

Many CFRP projects use implementation or effectiveness monitoring. These handbooks are generally oriented toward effectiveness monitoring, as it provides useful feedback without having to prove as much “causality” as validation monitoring may require.

Stakeholders in a project may decide to use a combination of monitoring approaches. For example, a group may wish to use effectiveness monitoring to measure the ecological effects of their project and implementation monitoring to assess social or economic effects of the project.

What to monitor—choosing goals _____

Your multiparty monitoring group will be faced with the challenge of choosing what exactly to monitor. These handbooks include dozens of examples for what can be monitored, many more than anyone could use for any given project. All monitoring groups are faced with limitations of time and money, and you will

There are at least three approaches to monitoring:

Implementation monitoring—“Did the project do what it said it would?”

Effectiveness monitoring —“Was the project effective in achieving its goals?”

Validation monitoring – “Were the project assumptions correct?”

Causality is the extent to which an action directly influences change in something else.

have to carefully consider what data will provide you with the most useful information.

A good place to start is by examining your project goals. For example, Collaborative Forest Restoration Program grant recipients might start by looking at the program goals outlined in the Community Forest Restoration Act (Public Law 106-393, the federal law that created CFRP):

- 1 – To promote healthy watersheds and reduce the threat of large, high intensity wildfires, insect infestation, and disease in the forests in New Mexico;
- 2 – To improve the functioning of forest ecosystems and enhance plant and wildlife biodiversity by reducing the unnaturally high number and density of small diameter trees on federal, tribal, state, county, and municipal lands;
- 3 – To improve communication and joint problem-solving among individuals and groups who are interested in restoring the diversity and productivity of forested watersheds in New Mexico;
- 4 – To improve the use of, or add value to, small diameter trees;
- 5 – To encourage sustainable communities and sustainable forests through collaborative partnerships, whose objectives are forest restoration;
- 6 – To develop, demonstrate, and evaluate ecologically sound forest restoration techniques.

Even more specifically, the CFRP legislation states that every Collaborative Forest Restoration Program grant recipient must include a multiparty assessment to:

- Identify both the existing ecological condition of the proposed project area and the desired future condition; and
- Report, upon project completion, on the positive or negative impact and effectiveness of the project, including improvements in local management skills and on the ground results.

What to monitor—choosing indicators _____

Once your group has identified the goals that it wants to monitor, it must select one or more indicators that can be used to measure changes in that goal.

While a goal is a broad “vision” of what you hope to accomplish with a project, and indicator is specific and measurable, telling you whether you are achieving your goals. For example, “forest canopy closure” is an indicator. If we measure it over time, we can tell if and how the forest canopy changed. In a thinning project, the canopy may change by becoming more open in some areas.

Table 1 gives some examples of monitoring goals and indicators that are discussed in later handbooks. Note that the goals are broad ideals that would be difficult to measure directly, while the indicators are more specific ways of measuring progress toward those goals. Also note that a single indicator can sometimes be used to measure change in more than one goal.

An indicator is a measurable unit that can be used to document change.

A good indicator is measurable, precise, consistent, and sensitive to changing conditions. When selecting indicators, multiparty monitoring groups will want to ask themselves whether a proposed indicator is:

- Relevant for the site and treatment?
- Sensitive to change so that it can detect change within the monitoring timeframe?
- Measurable with available methods that multiparty groups can use?
- Not subject to individual or organizational bias?
- Able to be measured by methods that are professionally accepted and understood?

See Handbook 4 and Handbook 5 for more information on choosing goals and indicators

Table I – Sample goals and indicators for monitoring ponderosa pine forest restoration

Sample goals	Sample indicators
Reduce threat of large, high intensity wildfire and re-establish low intensity surface-fire regimes	Density and size of trees Canopy closure Height from the ground to tree crowns Surface fuels cover and depth Number and size of landscape openings
Conserve wildlife populations and their habitats	Butterfly species abundance and composition Number and size of landscape openings
Enhance community sustainability	Consistency of job opportunities (number of workers employed by the project each month) Pay rates for project workers Processing capacity (amount and diversity of products)
Improve local workforce skills	Number of restoration-related job opportunities Training opportunities in forest restoration work

How to gather good data

No one wants to spend valuable time and money collecting data that in the end aren't useful or don't answer their questions. Implementation monitoring allows for relatively easy data collection. For example, it is fairly easy to state that 225 cords of wood were cut and sold by a project. Effectiveness or validation monitoring are more complicated, however, because it is more difficult to show that a project *directly caused* the changes that were measured.

There are a few precautions your group can take to help ensure that your data will be useful. The following suggestions help create “good” data, which can more clearly show the direct influence of your project on the goals you want to measure. These precautions are particularly important for effectiveness or validation monitoring.

Baseline data provide information about the conditions in a project area before the project was started.

1 – Document conditions before a project starts

It is important to document the project site's conditions *before* beginning the project, in order to have some basis for comparison later. Documenting pre-project conditions means gathering data about those things the monitoring team is concerned about before starting the project. This is often called collecting *baseline data*.

2 – Document conditions after a project is implemented

It is equally important to take the *exact same measurements* after a project has been carried out as you took before the project started. Comparisons of data collected before and after a project can demonstrate changes that result from the project or that happen at the same time the project is implemented.

For example, if a project is trying to reduce the number and density of small-diameter trees, the group may decide to monitor tree size and density. The group would need to measure these indicators before and after thinning occurred. If the number of

trees was only measured after the project was completed, then there would be no way to reliably show how many small diameter trees were removed, because no one would know how many there were before the project started.

A control site is an area that is similar to the project area but where no project activities take place.

—
Controls help show which changes occur from project activities and which may be from outside factors.

3 – Document conditions in “control sites”

There are many factors other than project activities that could influence changes in a project area. For example, a law or regulation could change, new markets could develop for a small diameter wood, there could be a long-term drought, or a wildfire could destroy a project site. It is always possible that observed changes have little to do with the project and a lot to do with outside forces.

Because it is impossible to control all the outside influences on a project, monitoring can be greatly strengthened by creating a “control site.” A *control site* is an area similar to the project site but where no project activities occur. The same indicators are measured in the control area as in the project area. The control site should be measured just as often and at the same time at the treatment sites, including before treatment occurs. Data from control sites help to show changes that result from outside influences.

For example, a 10-year drought may cause many plants to die or grow slowly. If data about plants were only collected within the project area, it would be impossible to tell if changes were due to the drought or to project activities. However, if the same data were collected from a control site, comparisons between the control and project areas might help show which changes were due to the project and which were due to the drought.

Handbooks 4 and 5 describe data gathering methods in detail

What is really doable? _____

Monitoring is costly both in terms of dollars and in the time commitment it requires. Too often, monitoring programs set out to gather too much data. The result is that little information is actually gathered, or the data gathered are of limited use. Your monitoring team should be realistic about its financial, technical, and human resources when developing its plan. Choose goals and indicators that are really important to your group and that will help demonstrate important or desired effects of the project.

Handbook 3 will help you create a monitoring budget to assist you in determining what is feasible

A monitoring plan template _____

Once project goals and monitoring indicators are clear, your multiparty team must develop a monitoring plan that identifies who will collect what information and when. Special care should be taken to ensure that the plan can be easily understood and used by all stakeholders. The following questions provide a starting point that you may find useful:

- What approach to monitoring will we take? (implementation, effectiveness, validation, or some combination)
- What goals will be monitored?
- What indicators will be used to describe these goals?
- What method will be used to measure each indicator?
- When and how often will measurements be collected? Who will collect these measurements?
- How and when will data be analyzed? Who will be involved in data analysis?
- What kind of reporting and outreach will be used? When will this take place?

Table 2 on the next page provides a template that your group can adapt when developing its own monitoring plan. While some monitoring plans may require more elaborate protocols that describe exactly how to measure certain indicators, a basic outline like this should be part of each monitoring plan.

Table 2 – Monitoring plan template

Project name: _____

Goals, indicators, methods, and timeline

Goal	Indicators	Monitoring approach*	Method	When/how often to collect	Who collects

Data analysis

Who analyzes	How analyzed		When

Reports and outreach

What	When	Audience	Who is responsible

* Implementation, effectiveness, or validation

Table 3 – Monitoring plan template example (partial sheet shown)

Project name: Improving forest health and community self-sufficiency in Villa Hermosa

Goals, indicators, methods, and timeline

Goal	Indicators	Monitoring approach*	Method	When/how often to collect	Who collects
1. Reduce wildfire risk	Density and size of live and dead trees	Effectiveness	Large plot sampling	Mid-summer, before, after, and every 5 years after treatment	Youth crew and community forester
	Height from ground to tree crowns	Effectiveness	Large plot sampling	Mid-summer, before, after, and every 3–5 years after treatment	Youth crew and community forester
	Surface fuels cover and depth	Effectiveness	Transect-based sampling	Mid-summer, before, after, and every 3–5 years after treatment	Youth crew and community forester
2. Improve community's economic self-sufficiency	Number of wood products produced	Implementation	Document review	Annually	Multiparty team (Ben, Alicia, Marvin)
	Income from wood products sales (per product and per person-hour)	Effectiveness	Document review and participant observation	Annually	Project manager
3. Develop work-force capacity to manage our forests and woodlands	Number of workers who complete chainsaw and safety trainings	Implementation	Document review	Annually	Project manager
	Percent of contracts awarded to local contractors	Effectiveness	Document review	Annually	Multiparty team (Ben, Alicia, Marvin)
4. Sustain viability of turkey and elk hunts	Time activities to avoid hunting seasons	Implementation	Document review and participant observation	Annually	Multiparty team (Ben, Alicia, Marvin)
	Increase number and size of landscape openings	Effectiveness	Transect-based sampling	Mid-summer, before, after, and every 3–5 years after treatment	Multiparty team (Ben, Alicia, Marvin)

* Implementation, effectiveness, or validation

Glossary

Baseline data: Data collected at the beginning of a project to document the existing situation. These data provide a benchmark against which change that occurs during the project period can be assessed.

Canopy: The plant overstory, comprised of the dominant and co-dominant trees.

Canopy cover: The percentage of a fixed area covered by tree crowns, measured as the horizontal cover of the ground that the canopy covers.

Causality: The extent to which an action directly influences change in something else.

Cause and effect: The extent to which one factor influences another.

Control site: An area similar to the project site but where no project activities occur. The same indicators are measured in the control area as in the project area.

Data: A set of observations collected through monitoring. Information is derived from data through analysis.

Ecosystem: An interacting system of living plants and animals and the nonliving parts of their environment.

Factors: Specific events, situations, conditions, policies, attitudes, beliefs, or behaviors that may affect the desired future condition.

Goal: A general summary of the desired state that a project is working to achieve. A good goal meets the criteria of being visionary, relatively general, brief, and measurable. A goal is typically less specific than an objective.

Indicator: A unit of information measured over time that documents changes in a specific condition. A good indicator meets the criteria of being measurable, precise, consistent, and sensitive.

Implement: To put a plan or agreement into action.

Information: Knowledge that is extracted from data through the process of analysis.

Monitoring: The periodic collection and evaluation of data relative to stated project goals, objectives, and activities.

Implementation monitoring is important for multiparty monitoring groups because it simply asks, ‘did we do what we said we would do?’ *Effectiveness monitoring* helps determine whether or not the project goals were attained by asking the question ‘did it work?’ Reducing the small trees that compete with old-growth ponderosa pine, and increasing forage for deer are examples of project goals that can be measured through effectiveness monitoring. *Validation monitoring* involves checking the assumptions upon which our restoration efforts are based. ‘Did reducing crown cover actually reduce the threat of catastrophic wildfire?’ is a validation monitoring question.

Monitoring plan: An outline for the steps you will undertake to ensure that the project is on track. It lists a project’s audience, their information needs, the strategies that will be used for data collection, the indicators, the methods that will be used to collect data, and when, by whom, and where data will be collected.

Multiparty: Involving members from a variety of backgrounds and perspectives.

Objective: A specific statement detailing the desired accomplishments or outcomes of a project. If the project is well conceptualized and well designed, meeting the project’s objectives should lead to the fulfillment of the project’s goal. Objectives are more specific than goals.

Resources: Items that a project needs, such as staff time, managerial time, local knowledge, money, equipment, the presence of trained people, and social and political opportunities.

Stakeholder: Person who has vested interest in the natural resources or who potentially will be affected by project activities.

Transparent: Easily accessed and understood; obvious in structure and meaning. Transparency means that all project information, including goals, actions, and accomplishments, is available to and clearly understood by anyone.

Unit: A single item or individual. For example, a community, a household, a person, a garden plot, or a tree.

Acknowledgments

Many people offered their time and expertise toward the development of the monitoring guidelines that form the basis of these handbooks. We gratefully acknowledge the contribution of the following individuals:

Craig Allen, U.S. Geological Survey/Midcontinent Ecological Science Station
Gregory H. Aplet, The Wilderness Society
Dennis Becker, USDA Forest Service, Pacific Northwest Research Station
William Block, USDA Forest Service, Rocky Mountain Research Station
Sam Burns, Fort Lewis College
Nils Christoffersen, Wallowa Resources
Geneva Chong, U.S. Geological Survey
Max Cordova, El Greco and La Montana de Trichas
Cecilia Danes, University of Vermont
Rick DeIaco, Village of Ruidoso
Tori Derr, Forest Trust
Carl Edminster, USDA Forest Service, Rocky Mountain Research Station
Don Falk, University of Arizona, Tree-Ring Research Lab
Deborah Finch, USDA Forest Service, Rocky Mountain Research Station
Cornelia Flora, Iowa State University, Center for Rural Development
Peter Fulé, Northern Arizona University, Ecological Restoration Institute
Peter Gaulke, USDA Forest Service, Region 3
John Gerritsma, USDA Forest Service and Bureau of Land Management
Quinn Griffin, Escalante Heritage Center
Richard Hart, Ashland, Oregon
Jan-Willem Jansens, Common Ground
Ajit Krishnaswamy, National Network of Forest Practitioners
Andrea Bedell Loucks, Pinchot Institute for Conservation
Taylor McKinnon, Grand Canyon Trust
Mary Mitsos, National Forest Foundation
Bob Moore, Catron County Citizens Group
Ann Moote, Northern Arizona University, Ecological Restoration Institute
Dan Neary, USDA Forest Service, Rocky Mountain Research Station
Brian Nowicki, Center for Biological Diversity
Melanie Parker, Northwest Connections
Deborah Potter, USDA Forest Service, Region 3
Michael Quintana, New Mexico Community-based Forestry Alliance
George Ramirez, Las Humanas Cooperative
William H. Romme, Colorado State University
Melissa Savage, Four Corners Institute
Todd Schulke, Center for Biological Diversity
David Seeholtz, USDA Forest Service, Region 3
Tom Stohlgren, Colorado State University
Joe Truett, Turner Endangered Species Fund
Bob Unnasch, The Nature Conservancy
Lisa Wilson, Watershed Research and Training Center
Barbara Wyckoff-Baird, The Aspen Institute
