

Navigating the Motives and Mandates of Multiparty Monitoring



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The Ecological Restoration Institute at Northern Arizona University is a pioneer in researching, implementing, and monitoring ecological restoration of southwestern ponderosa pine forests. These forests have been significantly altered over the last century, with decreased ecological and recreational values, near-elimination of natural low-intensity fire regimes, and greatly increased risk of large-scale fires. The ERI is working with public agencies and other partners to restore these forests to a more ecologically healthy condition and trajectory—in the process helping to significantly reduce the threat of catastrophic wildfire and its effects on human, animal, and plant communities.

Cover photo: A collage of activities (planning, monitoring, and analysis) are integral to a successful multiparty monitoring program.



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Executive Summary

In this paper, we discuss what we learned about multiparty monitoring for collaborative, community-based forest restoration projects, after providing technical assistance and training to more than 50 New Mexico community groups between 2002 and 2007. These community groups were all recipients of Collaborative Forest Restoration Program (CFRP) cost-share grants. The grants require multi-stakeholder monitoring and assessment of project effectiveness in terms of ecological change and effects on management skills. Because all CFRP grantees are required to monitor their projects, this program provided a unique opportunity for assessing community-based, multiparty monitoring of forest restoration projects. Given four years experience providing monitoring assistance to CFRP grantees, we explore the following questions: What are the goals of multiparty monitoring? How does it work? What are reasonable expectations of multiparty monitoring? What are the best ways to help community groups achieve these expectations? Finally, how should a community prepare for the implementation of multiparty monitoring in a community-based forestry program?

What is Multiparty Monitoring?

Monitoring is the process of periodically collecting and evaluating data to determine changes occurring over time. It is often used in land management as a means of ensuring that projects and activities are meeting their stated goals and objectives, and to provide information for evaluating assumptions and expectations. In a multiparty monitoring process, a diverse group of people with differing backgrounds, experiences, and perspectives (i.e., stakeholders) work together to better understand project efforts and effects (Bliss et al. 2001). This type of monitoring reflects a national trend toward broader participation in land management decision-making, especially on public lands.

There are several underlying motivations for embarking on a multiparty monitoring program or process. To some people, including many community forestry groups, the primary goal of multiparty monitoring is conflict management through shared learning (Kusel et al. 2000, Bliss et al. 2001). From this perspective, multiparty monitoring is a way to bring together people with disparate opinions and experiences to discuss forest management, come to some agreement about desired outcomes, and collectively evaluate whether current management is moving them toward their common goals. Social equity issues are often inherent in this type of monitoring. In the Pacific Northwest, for example, multiparty monitoring has been used to evaluate the distribution of agency contracts among forestry practitioners and to examine the social, economic, and ecological aspects of wild mushroom harvest on public lands (Moseley and Wilson 2002, Lynch et al. 2004).

To others, including many scientists, restoration practitioners and land managers, the primary purpose of multiparty monitoring is to produce reliable data that can inform future management or to construct a picture of change resulting from management treatments (Bliss et al. 2001, O'Connor et al. 2005). From this vantage, the monitoring process serves to accurately measure the outcomes of specific actions, so that future management can be adjusted in response to the information gained from monitoring. This approach to monitoring, also known as *effectiveness monitoring*, is frequently used to assess ecological and economic outcomes of projects, and to adjust management activities as needed based on these findings. This approach to monitoring may even include components of *validation monitoring*, a process that uses highly sensitive methods and analysis techniques to test hypotheses and validate theories.

Still others, particularly funding entities, believe the primary goal of multiparty monitoring is project evaluation and reporting. Monitoring for project evaluation provides accountability by helping project managers demonstrate how well they have addressed project and program goals. It also produces data that can be aggregated for programmatic assessment. This type of monitoring often falls under the category of *implementation monitoring* and is used to track implementation of project accomplishments, such as the number of acres treated, number of jobs created, or the costs of carrying out specific project activities.

Monitoring for the Collaborative Forest Restoration Program

The Collaborative Forest Restoration Program (CFRP) was created by the Community Forest Restoration Act of 2000 (Title VI, Public Law 106-393) to address conflicts surrounding forest management in New Mexico, promote forest ecosystem health and sustainable communities, and develop capacity for forest restoration and utilization of small-diameter wood. The CFRP provides cost-share grants to collaborative groups engaged in experimental forest restoration projects. As one of their grant requirements, recipients are required to convene a multi-stakeholder group to monitor the effectiveness of their projects. While CFRP grantees are responsible for ensuring the completion of multiparty monitoring for their project, each CFRP project takes a unique approach to monitoring planning and implementation. As such, the grantees themselves may or may not be involved in actual monitoring activities. Grantees may decide to meet their obligations through the use of volunteer monitoring partners, through partnerships with the U.S. Forest Service or other land management agencies, through the use of paid contractors, by performing monitoring duties themselves, or some combination of these possibilities.

Among other conditions, the Community Forest Restoration Act of 2000 requires funded projects to:

- “include a diverse and balanced group of stakeholders as well as appropriate Federal, Tribal, State, County, and Municipal government representatives in the design, implementation, and monitoring of the project.”
- “include a multiparty assessment to identify 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.”

The monitoring requirements of the legislation include aspects of each of the three types of monitoring discussed above: mutual learning, effectiveness monitoring, and implementation monitoring. The requirement to conduct monitoring using a diverse and balanced group of stakeholders reflects the program’s goals of improving communication and joint problem-solving among stakeholders. The legislation also clearly requires effectiveness monitoring to assess the ecological effects of CFRP projects. The program administrators and the Technical Advisory Panel that reviews project proposals and recommends projects for funding have expressed a preference for standardized monitoring to support project evaluation and programmatic monitoring.

The Development of Multiparty Monitoring Within the CFRP

The first CFRP projects were funded in 2001. By 2002, CFRP Technical Advisory Panel members and grant recipients were expressing confusion about the monitoring requirements and requesting assistance to meet them. That year, more than 40 academic and agency researchers, forestry practitioners, and community organizers worked together to develop a set of guidelines for multiparty monitoring of forest restoration projects in the southwestern United States. The product of their work was a lengthy and fairly technical document (USDA Forest Service 2003). In 2003, the CFRP funded a technical assistance program to develop clearer and more simply written guides to help CFRP grantees increase their capacity to monitor their forest restoration projects.

Between October 1, 2003 and December 31, 2006, the technical assistance team, of which all of the authors are or were members, developed a series of six monitoring handbooks (CFRP 2005) to guide grantees through each step of the monitoring process. The team also developed other tools, including a curriculum guide for middle- and high-school students engaged in monitoring, and three plant guides to help grantees monitor plant composition. The team provided hands-on assistance in designing and implementing multiparty monitoring to 55 grantee communities and several prospective grantees. The following discussion is derived from our collective experience assisting CFRP grantees with multiparty monitoring from 2002 through 2006.

Lessons Learned

The four major lessons we learned from our experience with CFRP multiparty monitoring are:

1. Clarity of purpose is very important when embarking on a multiparty monitoring program. Because of the wide diversity of activities and approaches that can be considered “monitoring,” there may be a variety of associated expectations, methods, and goals.
2. Developing and implementing a multiparty monitoring plan can be difficult for many communities. Monitoring requires a certain level of skill in data collection and data management, and many communities have a low capacity to do good monitoring.
3. Monitoring requires a substantial investment of time, money, and resources. Many CFRP groups struggled because they failed to budget money and time for monitoring.
4. Many projects can benefit from consistent, project-specific assistance by knowledgeable, outside entities. The CFRP multiparty monitoring assistance team found that most projects receiving assistance showed improvements in monitoring quality.

Lesson 1. Projects Need a Clearly Defined Purpose

There are at least three different views about the desired ends and means of monitoring community-based forest restoration projects, and each has distinct requirements. Process is of paramount importance when the purpose of monitoring is mutual learning, methodology is vital when monitoring results are meant to inform management, and monitoring for project evaluation requires clear, standardized criteria.

It should be noted that these three approaches are not mutually exclusive. A community may, for instance, wish to use a very active multiparty process, use rigorous methods, and provide information for project or program evaluation. Moreover, all these approaches depend on meaningful, credible monitoring data. However, each multiparty monitoring group must determine what to monitor and how to monitor it, depending on their primary motivation. Within the CFRP program, clarity of monitoring purpose was often lacking, which led to confusion on the part of grantees and, at times, resulted in wasted effort.

Monitoring for mutual learning requires a discussion-based group process

When the motivation for multiparty monitoring is improved communication, joint problem-solving and management of actual or potential conflicts, it is important to ground the process in substantive discussions among diverse stakeholders. This allows diverse parties to ensure their interests and concerns are addressed by the monitoring. For this type of monitoring, methods may be less rigorous than when the goal is effectiveness monitoring or implementation monitoring, although they should not produce inaccurate or misleading data.

When the goal is mutual learning, the group may not care to know whether results represent conditions across a community or other population. As an example, for one CFRP project, a local youth designed a questionnaire to assess employees’ learning and skills development. In the questionnaire, members of the thinning crew were asked questions such as: “What do you like about your job?” “Has this job changed your attitude about the forest? In what way?” “Do you have any safety concerns when you are working?” “Do you think this job is temporary or something you will do for a long time?” In another project, the Torreon Band of the Navajo Nation used an annual focus-group stakeholder meeting to assess the social effects of a project on Tribal land, with monitoring indicators chosen by project partners. Data gathered by these methods will not reflect the views of anyone other than those who provided them, but they still provide useful feedback to the multiparty monitoring team.

In some cases, teaching data collection skills and promoting learning about the natural and cultural environment may be an explicit goal of monitoring. One CFRP project, on a Hispano land grant in central New Mexico, engaged local youth in monitoring populations of culturally important plant species following a restoration project, with a specific focus on connecting young people with elders in the community. Another, located in the Jemez Mountain School District in rural northern New Mexico, embarked on a four-year education program

that is engaging nine students in monitoring nearby restoration projects. Monitoring training sessions, class projects, and time spent monitoring in the woods are serving to raise student awareness and knowledge of the natural environment in their backyards. Additionally, by continuing their forest-based curriculum for four years, these students will go beyond data collection and perform data analysis, interpretation, and develop practical forest skills. In this case, the benefits of monitoring include environmental education and the development of important field and analytic skills that may be applicable to future employment.

When the goal is mutual learning about project issues important to local stakeholders, monitoring goals and indicators should be collectively developed and selected by the affected parties to fit their project-specific goals and stakeholder interests, and the group should play a very active role in interpreting monitoring results. In 2005, the technical assistance team interviewed all current grantees and found that 68 projects were monitoring more than 100 different ecological indicators and more than 75 different social and economic indicators, using a variety of different methods. For instance, some groups were particularly interested in project effects on specific animal species, while others were concerned about specific economic issues, such as new transportation strategies for removing wood from project sites. These groups often needed technical assistance to select indicators that were both appropriate to their goals and measurable using reliable data collection methods, and to ensure that their monitoring data would accurately reflect changes happening in the nonhuman and human spheres.

Although some advocate using multiparty monitoring as a way to reduce conflict over forest management, we did not find that this was a frequently used motivation for CFRP multiparty monitoring groups. Nonetheless, some groups did use multiparty monitoring meetings to address contentious issues among project partners. In one case, a Forest Service district office and the local prescribed burn crew determined a CFRP site unsuitable for prescribed fire due to heavy surface-fuel loading. The grantee disagreed, arguing that the site had similar fuel loads to other projects that had been burned with prescribed surface fire without additional surface fuel removal. The grantee also argued that full surface fuel removal was not part of his responsibilities outlined in the approved grant agreement.

This disagreement stemmed from alternative interpretations of the language in the approved grant document. At that time, the monitoring team had gathered both baseline and post-treatment (but not post-removal) surface fuel data. These data were used to inform the multiparty team about the extent of surface fuel generated, which was beyond the amount of surface-fuel loading the local Forest Service prescribed fire team was comfortable burning. The multiparty team and grantee acknowledged that the return of surface fire to the stand was a high priority, and the grantee agreed to remove additional surface fuel to create site conditions conducive to the return of prescribed surface fire. This concession significantly changed the course of the grant due to the high cost of fuel removal from this remote site and, as a result, some restoration treatments were eliminated. Nevertheless, sharing the available surface fuel data collected by the multiparty monitoring team provided neutral common ground that aided communication between members of the multiparty team and helped resolve the conflict.

Monitoring to inform management requires a higher degree of reliability

For some, the primary goal of monitoring is to produce ecological, social, or economic data that can inform project management. The ultimate use of these data may be in adding to the common pool of knowledge, providing information to shape future management, or simply constructing a picture of change over time. This approach often emphasizes effectiveness monitoring, which attempts to answer questions about the effect of a change (such as a restoration treatment) on some variable of interest (such as wildlife populations, fuel loadings, or plant diversity). This type of monitoring tends to use sampling designs and statistical analysis techniques similar to those used in scientific and social research. Few community-based groups have capacity for this type of monitoring (see lesson #2 below), although some can do it with sufficient training, guidance, and oversight. In our experience, grantees' capacity for this type of monitoring improved dramatically after technical assistance became available (Ecological Restoration Institute 2007).

Effectiveness monitoring may be more thorough and successful where there is local interest in information

produced by monitoring efforts, and especially where the project proponents have strong ties to the land and influence over future management. For example, the Santa Ana Pueblo, like many of the pueblos arrayed along the Rio Grande, has created a strong monitoring program for its CFRP projects. One component of the monitoring design is a comparison of a pair of pinyon-juniper stands that were thinned to different prescriptions. Monitoring of this kind reflects a strong interest in tracking the outcome of restoration treatments. It is also creates a good basis for adaptive management and fine-tuning the design of future restoration projects.

On the other hand, community-based groups may not be motivated to undertake effectiveness monitoring if they have little or no influence (or perceive they have little influence) over future management decisions. This can happen, for example, when projects take place on public lands and the community groups monitoring these projects operate outside of the project planning process for those lands. In such cases, it is important to integrate the land management agencies into the monitoring process or, at least, make them aware of the monitoring group's efforts and encourage them to use the monitoring results. For example, a local U.S. Forest Service ranger district in New Mexico is hoping to learn about aspen management from the ecological monitoring of a CFRP project's aspen regeneration treatment (the first treatment of its kind on the district). In another case, however, managers appeared to be disinterested in monitoring results that demonstrated that a fuels reduction treatment had changed species composition and had removed old and large trees of a particular species rather than maintaining species frequency.

Monitoring for project evaluation and program reporting requires specific, standardized measures and procedures

Implementation monitoring is a common approach for demonstrating accountability in terms of work completed and funding expenditures. This is particularly true for publicly funded projects. For the CFRP, there is an additional desire to aggregate results across funded projects as a means of tracking the effects of the program as a whole. For instance, CFRP administrators are interested in accurate accounting of acres treated and number of full-time equivalent jobs created by each project, both to evaluate project success and to be able to report total number of acres treated and jobs created by the program.

Implementation monitoring requires consistency in monitoring goals, indicators, and methods so that project managers clearly understand what is expected of them and program administrators can easily aggregate data from several projects. Indicators are typically implementation measures (e.g., number of people trained, number of acres treated), so methods are usually not onerous and may simply require careful record-keeping. For example, a recently completed CFRP project by the Ramah Navajo Band in western New Mexico produced a monitoring report listing implementation accomplishments such as the number of people trained in various skills, the number of acres treated by forestry crews, and the number of cords of firewood cut, split, and delivered. This required tracking of individual activities and accomplishments as they occurred. This kind of monitoring is becoming more common among CFRP grantees as these kinds of data are increasingly requested of them.

Successfully implementing this type of monitoring requires clear guidance and clear expectations on the part of program administrators or representatives of the funding entity. However, the evolving interests of program administrators have made grantees uncertain what particular implementation measures they are expected to report. For example, CFRP program administrators desire accurate data on jobs created as a result of this program. But simply reporting the number of people directly employed by the project can produce variable results because many projects employ people part-time or seasonally, and there may be high turnover in project personnel. Grantees that count each individual hired during the lifetime of the project may report a relatively high number of "jobs created," when the program wants to know the total number of full-time-equivalent jobs created by the project. Questions about types of jobs created and broader employment effects on the community can produce similar ambiguous results. However, when given clear guidance, grantees can and do provide accurate employment data.

It is also important to note that some desirable data--such as fire reduction modeling results, effects on regional economic trends, and the extent to which projects support state and national forestry targets and plans--are not easily monitored at the project level by individual communities. The skills and resources required to monitor these issues are beyond the financial and technical capacity of most community groups, and measuring them would likely come at the cost of reducing grantees' capacity to meet other project goals. Tracking indicators such as these is more appropriately the responsibility of program administrators.

Lesson 2: Many Community Groups Need Outside Assistance

Even with clear monitoring expectations and goals, a number of challenges to community-based, multiparty monitoring remain. In particular, it is technically difficult to gather reliable monitoring data. Most community groups require intensive assistance to identify appropriate monitoring indicators, develop a sampling design, and learn reliable data collection methods.

There are many challenges to obtaining reliable data, and technical assistance can help communities overcome these challenges

In our experience assisting CFRP grantees, we found that they needed to learn many new skills in order to obtain reliable monitoring data. Initially, the technical assistance program addressed these issues by providing handbooks that described how to select appropriate goals and indicators for CFRP projects, and detailed appropriate data collection methods for each of several recommended indicators. With time, it became clear that many grantees also needed considerable hands-on assistance to address these challenges as they arose.

One of the first steps in monitoring is deciding what to measure. In some cases, projects have been frustrated by attempts to monitor outcomes with no clear relation to their project, such as the effects of a small forest restoration project on in-stream flow in the local waterway or on populations of large game. Once a group has identified relevant monitoring goals, it needs to identify or develop indicators that will accurately measure change toward or away from those goals. Good indicators should be sensitive to change within the monitoring timeframe, be able to be measured using methods that are widely accepted and understood, and be unbiased. The CFRP grantees who chose to develop their own monitoring indicators frequently struggled with these requirements. For example, one group used the size of game animals observed on a relatively small treatment site as a measure of increased forage.

The next challenge is to identify reliable monitoring methods and develop a good sampling design. This was not always the case on CFRP projects. For example, some CFRP monitoring designs used too few plots for ecological monitoring, which meant that they did not gather enough data to accurately reflect conditions on their site. Other grantees wanted to measure change in community perceptions of forest health, but did not survey a representative sample of community members. Grantees who used monitoring handbooks or received on-site assistance were, however, two to three times more likely to be using reliable monitoring methods (Ecological Restoration Institute 2007).

Collecting accurate data can also be a problem. Some CFRP groups, particularly those that did not have the benefit of monitoring handbooks or technical assistance in the early stages of their project, failed to collect baseline data. As a result, they were unable to compare post-treatment ecological conditions to pre-treatment conditions and could not reliably report ecological effects of the project. A few grantees changed their monitoring indicators or methods after their baseline data was collected, resulting in pre-treatment and post-treatment data that were not comparable. Others had difficulty locating plots or transects or gathered data in locations outside of their treatment site. Many grantees postponed social and economic monitoring until their projects had ended, assuming that it would be a simple task to review project records and report on project accomplishments. In fact, it is often difficult to locate or recreate historical data on indicators such as jobs created, skills gained, or the volume and value of wood products generated.

It was not uncommon for CFRP projects to lose monitoring data or lose capacity for gathering good data, often due to time delays and turnover of personnel. For example, some projects went through a string of monitoring coordinator contractors, each of whom had a different idea of how to carry out monitoring. This prevented monitoring from occurring concurrent with project activities.

Finally, CFRP groups struggled with data analysis and interpretation. Some groups collected and reported reliable monitoring data, but did not analyze or interpret the data, making it of little use to the project. Others reported results that were not supported by monitoring data, reflecting the mistaken belief that monitoring needs can be met through casual observation, a cursory review of project records, or speculation. In one case, a CFRP grantee reported that their forest restoration project, with a total budget of under \$150,000, directly created 58 full-time jobs in the community. Another final project report stated that ladder fuels were effectively reduced because low branches on residual trees had been pruned.

In spite of these challenges, several CFRP groups successfully identified monitoring indicators appropriate to their project goals and used appropriate sampling designs and monitoring methods to track changes in those indicators. An analysis of monitoring conducted by all projects funded between 2001 and 2006 found that monitoring quality improved dramatically after technical assistance became available (Ecological Restoration Institute 2007). While fewer than one-third of projects funded in 2001 were found to be using appropriate social and economic indicators and methods, all projects funded in 2006 were using appropriate indicators and reliable methods (Ecological Restoration Institute 2007). A cross-comparison of technical assistance provided and the quality of grantees' monitoring showed that handbook use, site visits, and assistance with monitoring plan development all were positively and significantly correlated with good monitoring (Ecological Restoration Institute 2007). Examples of successful multiparty monitoring efforts from other regions of the country (for example, the Pacific Northwest and Arizona's White Mountains region) also demonstrate that community-based efforts can succeed in spite of common obstacles.

Lesson 3: Monitoring is Costly in Terms of Time and Money

Many people and groups underestimate the costs--in terms of both time and money--required to do good monitoring. In fact, monitoring requires a substantial amount of money, typically between 5% and 15% of a project's overall budget. During the first few years of the CFRP program, few project budgets included monitoring as a line item. This meant that project leaders were forced to reallocate time and funds from other aspects of the project to either hire people or reassign existing personnel to gather and analyze monitoring data. Budgeting for monitoring did improve once grantees received assistance in developing the monitoring portion of their project proposals.

The potential for good monitoring is increased further when those gathering the data have sustained involvement in monitoring and when there is a coordinator who is consistently involved, making sure data are collected at the appropriate times, and using appropriate methods and managing data.

Some communities will choose to use a monitoring contractor because contractors usually can understand and apply information from monitoring handbooks or develop their own reliable methods, write a monitoring plan, and do good data collection and analysis on their own. In some cases, contractors may be able to successfully facilitate multiparty meetings to guide the process of identifying important goals, indicators, and methods. In other words, they can handle the tedious and technical parts of monitoring while the project partners still take the lead in deciding what they want to monitor and interpreting the monitoring results. This has been particularly helpful to groups that lack the capacity, in terms of skilled individuals and available resources, to do good monitoring on their own. The expense of hiring contractors (upwards of \$100 per hour) underscores the importance of including monitoring expenses in the project budget.

In general, monitoring tends to be much more successful on projects that have an identified and paid monitoring coordinator--an individual with an aptitude and enthusiasm for monitoring. However, hiring a contractor to do monitoring can prevent learning and capacity building among partners and within the community. Having a contractor carry out the bulk of the monitoring responsibilities can detach monitoring from the rest of the project, making it “a task for someone else to do” rather than an integral part of community-based restoration. These can be major drawbacks if the goals of the project are learning and building community capacity. Additionally, the monitoring process has been disrupted in situations where contractors have quit or been fired before a project is completed. These potential problems can be addressed by having a good contract that identifies what the contractor is expected to do and by maintaining frequent, substantive communication between the multiparty team, project leader, and contractor. At a minimum, the contractor should participate in multiparty meetings early in the project, where the team decides what to monitor and chooses appropriate indicators, and near the end of the project, when partners can share and discuss monitoring results.

Young people can also help with data collection when given appropriate education and supervision. However, grantees who have used young people to collect data have sometimes found that the data gathered was not reliable. Youth crews do a better job of monitoring if they are paid, if the monitoring work is linked to a school curriculum, and if the youth are engaged in the entire monitoring process rather than only in the data collection phase.

Lesson 4: Community Groups Benefit from Consistent, Project-specific Assistance

To provide consistent, reliable and useful monitoring data, community groups may need very specific monitoring instructions and ongoing assistance. Groups with little or no experience in project management and monitoring require constant encouragement and guidance, while those with more experience benefit from regular reminders. Grantees who initially decline technical assistance often benefit from outreach to explain different aspects of multiparty monitoring. For all groups, technical assistance needs evolve with time as they move from monitoring plan development through data collection, analysis, and interpretation. They may need initial help developing a monitoring plan, then with data collection training, and later with data analysis. Because of these evolving needs, it is important that technical assistance providers regularly check-in with each project to ensure that they are on track and know what to do at any particular point in the process. In the CFRP, project and monitoring coordinators were typically receptive to monitoring assistance, but often needed reminding from technical assistance providers before they would initiate monitoring activities. This reflects the ongoing challenge that grantees have balancing monitoring and other project activities.

Monitoring teams often benefit from having their monitoring plan and sampling design reviewed by an outside party with expertise in monitoring or research. Many community groups will need assistance selecting measurable indicators that will reflect changes in the goals they want to achieve. Most CFRP groups needed assistance selecting simple, sound monitoring methods, developing a sampling design, analyzing their monitoring data, and interpreting the results. It is reasonable to expect that many community-based, multiparty monitoring teams will need intensive, ongoing assistance from the outset to achieve effective monitoring results.

Using handbooks, receiving on-site technical assistance, and receiving assistance developing or reviewing a monitoring plan were all positively and significantly correlated with good monitoring (Ecological Restoration Institute 2007). In general, handbooks and other written material were used effectively by higher-capacity groups, but most CFRP multiparty monitoring teams preferred to have written materials introduced and explained before they used them. Similarly, generic workshops addressing all aspects of the monitoring process may help introduce monitoring concepts, but they do not train groups to do monitoring on their own. For instance, the CFRP grantees who attended multi-day monitoring workshops were no more likely to have a monitoring plan or be using good monitoring indicators and methods than those who did not attend a workshop (Ecological Restoration Institute 2007). Grantees responded particularly well to site-specific technical assistance, and data showed that site visits focused on monitoring methods and assistance with monitoring plan development were relatively strongly and significantly correlated with each of the measures of monitoring capacity (Ecological Restoration Institute 2007).

Conclusions

Because all CFRP grantees are required to monitor their projects, this program provides a unique opportunity for assessing community-based, multiparty monitoring of forest restoration projects. In the six years since its inception, the CFRP and its grantees have struggled to define and meet the program's multiparty monitoring requirement. Views about the goals of CFRP multiparty monitoring have evolved and been clarified during this time. Guidelines and technical assistance on multiparty monitoring have evolved as well, largely in response to observed needs of the grantees. The authors' experience working with CFRP grantee communities have led to the following list of key questions to consider when beginning a multiparty monitoring process.

What are the Goals of Multiparty Monitoring?

Motivations for monitoring vary. Three common goals of monitoring are shared learning, tracking project effects (effectiveness monitoring), and project reporting (implementation monitoring). Each of these goals suggests different approaches to monitoring, so it is critical that monitoring goals be clear from the outset. The CFRP's enabling legislation includes all three of these motivations for monitoring, so program administrators and grantees have had the challenge of balancing and integrating them.

The CFRP programmatic monitoring requirement has encouraged grantees to think about and discuss their project goals and whether or not they are achieving them, and technical assistance has emphasized using multiparty meetings to both design monitoring plans and interpret results. Increasingly, grantees are following a consistent approach to monitoring that integrates multiparty process, effectiveness monitoring, and project reporting.

When Does Multiparty Monitoring Work?

Multiparty monitoring works best when it includes constructive dialogue among stakeholders and produces reliable and useful results. Specifically:

- To achieve mutual learning and joint problem solving, multiparty monitoring should start with focused dialogue among groups and individuals with a stake in project outcomes. Without group dialogue there is a risk that monitoring will not result in learning beyond the individual or group that gathers and analyzes the data.
- To achieve useful and reliable results, multiparty monitoring teams need very clear monitoring protocols, including appropriate indicators and methods, clear data management methods, and a sound means of analyzing and interpreting monitoring results. Without appropriate monitoring protocols, there is a risk that inaccurate, anecdotal observations and speculations will be presented as project outcomes.
- Multiparty monitoring does not work well without adequate funding and consistent oversight. In most cases, community groups require hands-on, ongoing assistance.

What are Reasonable Expectations of Multiparty Monitoring Projects?

Several CFRP groups have taken the mandate to monitor seriously, made admirable attempts, and still failed to gather reliable monitoring data. Consequently, most project-level monitoring data reported during the first five years of the CFRP has limited use for either programmatic reporting or adaptive management. In general, ecological data have been better than socioeconomic, and data quality for both kinds of monitoring has improved in recent years--a result of clearer instructions and ongoing technical assistance. Therefore:

- It is reasonable to expect community groups to produce defensible monitoring results that can be used for project reporting and mutual learning among project stakeholders.
- It is not reasonable to expect community groups to produce high-quality, research-level monitoring data.
- It is not reasonable to expect that community groups can undertake and execute monitoring without considerable guidance.

What are the Best Ways to Help Community Groups Achieve Their Goals?

For the 55 communities that received technical assistance with CFRP project monitoring, the most effective form of assistance was on-site, project-specific training and advice. Clearly written guidance was also helpful. A comparison of projects by funding year shows that the likelihood that grantees have a monitoring plan, are using appropriate indicators, and are using reliable data collection methods increased steadily from 2001 to 2006 as technical assistance became more available (Ecological Restoration Institute 2007).

- Collaborative Forest Restoration Program projects that received assistance developing a monitoring plan or had their monitoring plan reviewed by a technical assistance provider were significantly more likely to be using appropriate methods and indicators for both ecological and socioeconomic monitoring.
- Building capacity in all aspects of multiparty monitoring requires considerable time and frequent reinforcement.
- Despite the clear improvements in monitoring during the course of this project, the technical assistance providers believe that grantees will often need direct, project-specific monitoring assistance.

What Should Communities Expect When Planning a Multiparty Monitoring Project?

The motivations for, and expected outcomes of, the multiparty monitoring should be clear to everyone at the outset of the project. These will determine the best approach to use. Community-based and collaborative forestry projects are very site-specific, with different goals and widely varying motivations and capacities for monitoring. Monitoring requirements, guidelines, and assistance need to be tailored accordingly.

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Ecological restoration is a practice that seeks to heal degraded ecosystems by reestablishing native species, structural characteristics, and ecological processes. The Society for Ecological Restoration International defines ecological restoration as “an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability...Restoration attempts to return an ecosystem to its historic trajectory” (Society for Ecological Restoration International Science & Policy Working Group 2004).

In the southwestern United States, most ponderosa pine forests have been degraded during the last 150 years. Many ponderosa pine areas are now dominated by dense thickets of small trees, and lack their once diverse understory of grasses, sedges, and forbs. Forests in this condition are highly susceptible to damaging, stand-replacing fires and increased insect and disease epidemics. Restoration of these forests centers on reintroducing frequent, low-intensity surface fires—often after thinning dense stands—and reestablishing productive understory plant communities.

The Ecological Restoration Institute at Northern Arizona University is a pioneer in researching, implementing, and monitoring ecological restoration of southwestern ponderosa pine forests. By allowing natural processes, such as fire, to resume self-sustaining patterns, we hope to reestablish healthy forests that provide ecosystem services, wildlife habitat, and recreational opportunities.

The ERI White Papers series provides overviews and policy recommendations derived from research and observations by the ERI and its partner organizations. While the ERI staff recognizes that every forest restoration is site specific, we feel that the information provided in the ERI White Papers may help decisionmakers elsewhere.

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