Handbook THREE

Creative budgeting for monitoring

Developing budgets for
Collaborative Forest Restoration Program projects

January 2004

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 – Creative 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, Forest Trust, Four Corners Institute, National Forest Foundation, Pinchot Institute for Conservation, USDA Forest Service - Collaborative Forest Restoration Program.

Copies of the multiparty monitoring handbooks are 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.

In addition to these handbooks, CFRP grantees are eligible for multiparty monitoring training workshops and technical assistance from the CFRP monitoring team (2004-2006) by calling 866.614.8424 or contacting any of the team members:

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How big is the monitoring bank?

As part of the planning process, monitoring teams select goals and indicators that are important to their group. Many times, groups create a lengthy list of items only to find that they have neither the time nor the money to carefully monitor all that is on the list.

There are helpful examples from existing CFRP grantees that show ways to make monitoring budgets work. This handbook provides the following information:

- How to establish realistic budgets,
- Sample budgets from existing projects, and
- Potential sources of funding to supplement ambitious monitoring efforts.

Establishing realistic budgets

Monitoring budgets vary, depending on what exactly a group chooses to monitor. The primary costs associated with monitoring are salaries, equipment, and transportation. Some people estimate that monitoring efforts should be roughly ten percent of the total budget for any given project. However, ten percent may not always be enough to complete a large monitoring project. The sample budgets in this handbook fall within the range of one percent to ten percent of overall project costs.

In-kind contributions refer to project expenses that are paid for or donated from a source other than the CFRP grant.

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Since CFRP grants are federal funds, the in-kind match cannot come from another federal source.

One of the ways to bring creativity to a budget and stretch it considerably, is to use in-kind (non-CFRP) sources for salaries, equipment, or transportation. For example, a teacher who is already receiving a school salary may contribute to a project without using any CFRP funds. The teacher's time and other project-related expenses could then be counted as an in-kind contribution. Borrowing equipment from a local nonprofit organization is another example of an in-kind contribution to a project. In-kind contributions are a requirement of all CFRP projects.

Salary costs

Some CFRP projects hire an individual specifically to carry out monitoring work. Other groups rely on many people, each of whom works on certain aspects of a monitoring project. Regardless, salaries for monitoring efforts can add up quickly. There are many options for hiring or paying people to lead a monitoring effort or collect data. Some examples include:

- Hiring a consultant who has particular expertise in the areas to be monitored
- Working with a science class and/or hiring a school teacher part-time to collect data with the class or on his/her own time
- Employing or working with nearby youth crews to carry out data collection
- Involving a project member or stakeholder who also works on other aspects of the project

Of these examples, the most expensive is hiring a consultant, but this may also be the most efficient way to get monitoring done. Consultants shouldn't require training and should be able to step right into a monitoring project. For others, it may be necessary to provide training, and this could increase the cost to the project.

The amount required for salaries will vary based on the type of workers used to collect and analyze monitoring data and the extent of the monitoring program. This makes it very difficult to generalize about salary costs. The sample monitoring budgets in the next section show salary costs associated with three different monitoring projects. Table 1 on page 3 summarizes rates of pay for a variety of personnel, based on actual project budgets.

It is important to keep in mind that even fairly extensive monitoring projects may not require more than two or three weeks of full-time work, or 80-120 hours to complete monitoring in a given season. This would put salary costs at

Table 1 – Estimated personnel costs for project monitoring

Type of worker	Payment method	Pay range
Consultant	Hourly wage or lump sum	$40-100/hr
Science class/science teacher	In-kind and/or hourly wage	$15-20/hr
Youth crew	Hourly wage	$7-12/hr (but usually multiple workers)
Project member	Hourly wage or salary	$10-25/hr

anywhere from $800–$12,000 per year, depending on the type of worker employed and the amount of time required to carry out monitoring tasks.

Equipment costs

Equipment costs for ecological monitoring can range from a few hundred dollars to a few thousand, depending on the type and amount of equipment needed. Table 2 on the next page lists common types of monitoring equipment and their costs. It may be possible to locate or borrow at least some equipment from local sources. These might include a collaborating agency, such as the Forest Service, or a nonprofit organization or university that is involved with the project.

The most expensive pieces of equipment for ecological monitoring are a Global Positioning System (GPS) unit and photographic equipment. These items can cost anywhere from $200-500 or more. Along with the initial purchase of equipment, there is an additional expense of the software and computer technology necessary to use the data collected with GPS or digital cameras. Film processing for 35 mm cameras can also become very expensive. It may be worthwhile to borrow or share these items with other agencies, organizations, or projects, whenever possible.

Table 2 – Estimated material and equipment costs

Item	Estimated cost
Aluminum tags	$35-40
Camera, 35mm	$125 and up
Camera, digital	$200-400 and up
Cassette tapes	$25
Clinometer	$100
Clipboard	$5
Compass	$15-20
DBH (diameter at breast height) tape (also called logger's tape)	$12-25
Field notebook/paper	$5
Flagging tape	$2
Film, 35mm	$100 or more
GPS (global positioning system) unit	$200-500 and up
Hammer	$10
Increment borer	$150-200
Measuring tape, 100ft	$50
Measuring tape, 300ft	$100
Metal stakes or rebar	$25-50
Pin flags	$5
Permanent writing markers	$5-15
Soil compaction meter	$250
Tape recorder	$50
Transcription machine	$200
Various PVC pipe sections for plot squares	$25-50

Equipment suppliers include:

The Ben Meadows Company
Box 5277, Janesville WI 53547
1.800.241.6401
www.benmeadows.com

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Forestry Suppliers, Inc.
205 West Rankin St.
Box 8397
Jackson MS 39284
610.354.3565
www.forestry-suppliers.com

Or, it may be that your monitoring team decides that some equipment is not essential to the project. GPS, while producing useful maps of the locations of data, does not currently have the precision necessary to replace stakes or other physical markers of plots, and it may be that foregoing the latest in technology can save your project money.

The Ben Meadows Company is a good source of equipment for ecological field sampling. They can be contacted at Box 5277, Janesville WI 53547; 1.800.241.6401; or www.benmeadows.com. Another good equipment source is Forestry Suppliers, Inc., 205 West Rankin St., Box 8397, Jackson MS 39284, 610.354.3565, www.forestry-suppliers.com. Other items, such as field notebooks, permanent-ink markers, tape recording, or camera equipment may be found at most office supply stores. Some on-line retailers offer good deals on camera equipment and other items.

Transportation costs

Transportation costs for monitoring include vehicle gas and maintenance for people using personal vehicles to commute to and from a worksite. Transportation costs can become significant for projects located in more remote areas of national forest land, where distances can add up. Your monitoring budget should include the cost of reimbursing monitoring team members and other workers for their driving expenses. If consultants are hired, they may also request payment for transportation, and if the consultant does not live very close to the site this can become a big expense.

The most common way of estimating transportation costs is by mile, and the current standard rate is $0.36/mile. So, to calculate the total transportation costs for one season of monitoring, use the following formula:

(number of miles roundtrip) x (number of trips per season) x ($0.36/mile)

For example, if the project site is located 20 miles from town and 10 trips are estimated, this would be:

40 miles/roundtrip x 10 trips x $0.36/mile = $144 for the season

Sometimes it is possible to negotiate a lower transportation reimbursement rate or to have a project member donate this cost as an in-kind expense. The cost is a real one, though, so it is a good idea to budget a certain amount for transportation so that people can afford to stick with the project.

Sample monitoring budgets

The following budget examples are from projects funded by the Collaborative Forest Restoration Program. Some of the budgets have been slightly modified, and organization names have been removed simply to put focus on the budgets rather than on the projects or certain groups. These examples represent a range of projects, both in the extent of the monitoring and in the number of individuals involved.

Budgeting for consultants

For this project, both ecological and economic data were to be monitored. The project planned to hire two separate consultants, one to collect and analyze ecological data, and one to do monitor economic impacts. The project leaders calculated a total monitoring budget of $19,000 for four years, which was five percent of the total project budget.

Ecological monitoring was to evaluate the following:

- changes in overstory canopy cover;
- changes in woody species density, basal area, and composition;

- changes in understory canopy cover including grass, forb, and shrub density and composition;
- changes in overall species richness;
- changes in soil stability and susceptibility to erosion; and
- the treatment's effectiveness at increasing understory complexity while reducing the likelihood of unnatural crown fire.

Baseline data for all of these indicators were to be collected in Year 1, and post-treatment data were to be collected in Years 2, 3, and 4. Total time estimates were greater for Years 1 and 4, when transects and plots needed to be established or greater amounts of information were to be collected.

Table 3 shows the project's budget for hiring an ecological monitoring consultant. Rather than being paid on an hourly basis, the ecological consultant was paid a lump sum for monitoring work each year. For example, in the first year, two weeks of work were budgeted at $5,000. The cost for hiring an ecological monitoring consultant totaled $15,000 over four years, accounting for less than five percent of the total project budget.

Table 3 – Budget for hiring an ecological monitoring consultant

Project year	Time estimated	Cost
Year 1	2 weeks (80 hours)	$5,000
Year 2	1 week (40 hours)	$2,500
Year 3	1 week (40 hours)	$2,500
Year 4	2 weeks (80 hours)	$5,000
4-year total	6 weeks (240 hours)	$15,000

Economic monitoring for this project was to evaluate the economic benefit related to:

- the volume of wood extracted, and the value to local residents of this resource;
- the supply of existing markets and any new strategies or businesses that develop to use small diameter wood;
- the number of service contracts offered to commercial operators from adjacent communities;
- the number of additional jobs supported by fuelwood collection during the project;
- the number of youth trained in forest restoration practices; and
- the value of acreage restored and/or treated for fuel management.

In order to achieve this, the project hired a community member to collect and analyze data from Years 2-4. The budget provided a lump sum payment to this economic consultant of $4,000, or approximately 1 percent of the total project budget.

Budgeting for a youth crew

This project called for monitoring of three ecological variables:

- Changes in overstory canopy cover
- Changes in woody species density, basal area, and composition
- Changes in understory canopy cover including grass, forb and shrub density

The project coordinator worked to identify youth to participate in monitoring and coordinated their training and the timing of monitoring. Training was provided by an outside source at no charge to the project. Youth worked for one week each in Years 1 and 2 and for two weeks in Year 3, and were paid at a rate of $8/hour. Because the project area was small, the amount of time, including youth training, was also small, as is reflected in the

Table 4 – Budget for monitoring with a youth crew

Project activities	Estimated amount	Cost
Year 1		
Youth training; baseline data collection	2 youth x 40 hrs x $8/hr	$640
Equipment, including film development		$1000
Travel	120 miles/day x 5 days x $0.36/mile	$216
Year 2		
Post-treatment data collection	2 youth x 40 hrs x $8/hr	$640
Travel	120 miles/day x 5 days x $0.36/mile	$216
Year 3		
Data analysis	2 youth x 80 hrs x $8/hr	$1,280
4-year total		$3,992

budget shown in Table 4. The monitoring budget was just under $4,000, or approximately one percent of the total project budget.

Budgeting for many collaborators

The final example is from project that began a few years before it received CFRP funding. Many funding sources contributed to the project including the CFRP grant; private foundation grants; in-kind salaries of a local YCC crew, school teachers, federal agency personnel, and nonprofit organizations; and donated (unpaid) hours from project participants. This example also shows how monitoring plans may evolve over time.

This monitoring team began by working with a local youth crew and a middle school class to examine ecological effects of restoration work, including:

- Changes in overstory canopy cover
- Changes in woody species density, basal area, and composition
- Changes in understory canopy cover, including grass, forb, and shrub density
- Changes in riparian cover and species composition.

Later, a socioeconomic component was added to the project. This involved mapping the distribution of grant funds in the project area and monitoring forest restoration jobs created in the community.

In the fourth year of the project, the team began monitoring changes in medicinal plant composition

Because of the large number of partners involved in this monitoring effort, the budget is rather complex. The estimates on the next page—Table 5—are an attempt to replicate the true costs of this monitoring effort.

The scope of this monitoring project was large, and there were many costs. If monitoring expenses had come entirely from the CFRP project, they would have been approximately ten percent of the overall budget. However, because the monitoring project drew from a wide range of sources, the overall cost from CFRP funds was actually quite small, accounting for approximately one percent of the total budget.

Table 5 – Budget for monitoring with many collaborators

Project activities	Estimated amount	Cost
Ecological monitoring (4 years)		
Project coordination*	2 adults x 40 hrs/yr x $20/hr x 4 yrs	$6,400
Youth training and data collection*	8 youth x 40 hrs/yr x $7.50/hr x 4 yrs	$9,600
Equipment, including film development*		$1,000
Travel*	60 miles/day x 5 days x $0.36/mile x 4 yrs	$432
Mapping project (1 year only)		
Project coordination*	1 adult x 80 hrs x $20/hr	$1,600
Youth data collection*	2 youth x 80 hrs/yr $8/hr	$1,280
Travel*	500 miles x $0.36/mile	$180
Mapping supplies*		$250
Medicinal plant monitoring (2 years)		
Project coordination*	2 adults x 75 hrs/yr x $20/hr x 2 yrs	$6,000
Youth training and data collection	4 youth x 80hrs/yr x $7/hr x 2 yrs	$4,480
Youth supervisors	1 adult x 120 hrs/yr x $10/hr x 2 yrs	$2,400
Elder participation in planning*	10 elders x 1 meeting/yr x $35/elder x 2 yrs	$700
Elder participation in field work*	2 elders x 5 trips x $50/trip x 2 yrs	$1,000
Video documentation*	$200/yr x 2 yrs	$400
Travel*	275 miles x $0.36/mile x 2 yrs	$198
Project total		$35,920

* Indicates activities funded through sources other than CFRP grant funds, including: private foundation grants; in-kind salaries of a local YCC crew, school teachers, federal agency personnel, and nonprofit organizations; and donated (unpaid) hours from project participants

Potential funding sources to supplement CFRP monitoring

There are two important reasons to consider seeking additional sources to support your monitoring effort. First, as the above examples show, there are many ways to expand your monitoring budget by using CFRP funds in combination with other sources of support. Second, for monitoring data to be meaningful, it is often important to extend monitoring efforts well beyond current CFRP grant cycles. Many scientists estimate that in order to document real changes, it is necessary to collect data periodically over 10-20 or more years. Other sources of support thus become even more important in sustaining a monitoring effort.

Current CFRP projects have relied on the following sources of funding to supplement monitoring budgets:

- New Mexico Youth Conservation Corps (YCC)
- Federal funding from other, non-CFRP sources
- Charitable foundations
- Nonprofit organizations that provide training and technical assistance

New Mexico Youth Conservation Corps

Many YCC crews run each year throughout the state. Check to see if there is an existing crew nearby that could participate in your project's monitoring efforts. If not, your group may decide it is worthwhile to apply for a crew. YCC funding requires an extensive application process. However, the program can provide funds to involve youth in a wide range of forest restoration work, including monitoring. Because the funds are from state revenues, YCC funds may also be used as in-kind contributions to a project. YCC applications are generally due at the beginning of August for the following summer. Applications may be obtained off the YCC website, or by contacting the agency directly:

New Mexico Youth Conservation Corps,
141 East DeVargas St., Box 1948, Santa Fe NM 87504
505.827.1437
www.emnrd.state.nm.us/nmycc2/default.htm

Federal funding

The primary federal funding source is the USDA Forest Service. The amount of federal funding available for your project will depend of what your local forest district or national forest may be able to contribute. Funding may come through the contribution of vehicles, equipment, or personnel. Some districts have been able to acquire cooperative agreements or National Fire Plan funding to contribute additional money to a project. These funds can be very limited, but it is worth exploring with agency project partners.

Charitable foundations

Finally, charitable foundations may be viable sources for community-based monitoring projects. Relevant foundations will vary based on the type of monitoring and who will be carrying out the work. Some possible foundations, which have provided funding to small community organizations for natural resources work in the past, include the following:

New Mexico Community Foundation
343 East Alameda St., Santa Fe NM 87501
505.820.6860 - phone
505.820.7860 - fax
nmcf@nmcf.org

McCune Charitable Foundation
345 East Alameda St., Santa Fe NM 87501
505.983.8300 - phone
505-983-778 - fax
info@mccune.org

Thaw Charitable Trust
Box 2422, Santa Fe NM 87504-2422 (mailing address)
553 Canyon Rd., Santa Fe NM 87501
505.982.7023 - phone
505.982-7027 - fax

National Forest Foundation
NFF's Community Assistance Program is specifically oriented toward providing small grants to small or new community organizations. Contact:

District of Columbia Office
2715 M Street, NW, Suite 100, Washington D.C. 20007
202.298.6740 - phone
202.298.6758 - fax
www.natlforests.org/2003/grantchoose.htm

Glossary

Basal area. Basal area is the cross section at the root crown of the tree, expressed as square feet per acre or square meters per hectare. A measure of stand biomass.

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

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

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

Composition. A list of all the species that grow in an area.

Cover. The amount of the ground that is shaded by living plants, usually expressed as a percentage. Also, the cover of the ground by dead plants and plant parts, usually called litter cover, also usually expressed as a percentage.

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

DBH. Diameter at breast height.

Diameter at breast height. The diameter of a tree at breast height (approximately 4.5 feet above the ground on the uphill side of the tree).

Erosion. The movement of particles of soil across the surface of the ground or into watercourses; usually caused by water, but also by wind, gravity, and other factors.

Forb. A broad-leafed green plant whose stems are not woody, but not including grasses, sedges or rushes.

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.

Implement To put a plan or agreement into action.

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.

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, realization of a project's objectives should lead to the fulfillment of the project's goal. Objectives are more specific than *goals*.

Participation. Active involvement in the design, management, and monitoring of a project.

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.

Riparian plant species. Plant species that are found growing along the edges of streams, rivers and other watercourses, often including dry streambeds.

Sampling. Measuring a subset of individuals, households, trees or other factors in a population like a community, forest, watershed, or transect.

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

Treatment. A management action intended to address a health problem; often used synonymously with prescription.

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

Variable. A particular characteristic of a unit that an observer is interested in measuring. A goal is typically less specific than an objective.