

A Successful Experiment: The Boundary Spanner on the Bitterroot National Forest

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Abstract—The Bitterroot Ecosystem Management Research Project and the Bitterroot National Forest funded a boundary spanner to coordinate research activities taking place on the Forest, increase technology transfer and outreach, and foster increased dialogue among and between researchers and managers. Coordination involved use of a research special use permit and a GIS map to track research projects. This led to protection of researchers' study sites and forest resources, increased cooperation between and among the Forest and researchers, and safer working conditions. Technology transfer involved a mixture of methods, the most successful of which were events like field trips that provided opportunities for researchers, resource managers, and the public to interact. The boundary spanner helped increase dialogue among and between researchers and managers through personal interactions. A good boundary spanner should have a strong interest in research and learning in multiple discipline areas, minimal biases against researchers or land managers, willingness to understand the different cultures and organizational structures, good communication skills including listening skills, diplomacy, willingness to spend time working directly with people on both sides of the research/management boundary, good organizational skills, and willingness to network with a larger community of educators, other agencies, and the public.

Introduction

In 2000, fires burned 307,000 acres of the Bitterroot National Forest (Forest), almost a fifth of the Forest's land area. Like bark beetles homing in on charred trees, researchers swarmed to the Bitterroot. While the Forest has long been a focus of research, we suddenly had 60 research projects going on at once. At the same time, we were designing a comprehensive post-fire recovery project, which involved a huge and controversial Burned Area Recovery Environmental Impact Statement. Taking on tracking and coordinating research projects with recovery work was a daunting task. We also wanted to use the best available science in preparing the Environmental Impact Statement, and encourage research into questions that plagued us, and would likely plague other Forests faced with managing their lands post-fire.

Previous to this, the Bitterroot Ecosystem Management Research Project (BEMRP) had discussed creating a boundary spanner position. A boundary spanner is a person who works at the interface of science and land management, acting as a bridge between the two cultures represented by research scientists and land managers. The fires of 2000 provided the impetus, and let's face

it, the funding, to bring on that person—given the title of research/management coordinator. BEMRP and the Bitterroot National Forest jointly fund this position.

BEMRP is a unit of the Rocky Mountain Research Station that is run as a partnership involving the Rocky Mountain Research Station, Aldo Leopold Wilderness Research Institute, Bitterroot National Forest, Northern Region of the Forest Service, and University of Montana. Its mission is to “strengthen the scientific theory and practice of managing Rocky Mountain ecosystems at the landscape level in the context of social, economic, and ecological opportunities and constraints.” BEMRP itself is a boundary spanning group, providing researchers and managers an opportunity to directly interact, share research ideas, and design studies of mutual interest.

BEMRP and the Bitterroot National Forest defined three primary tasks for the boundary spanner:

1. Coordinate research activities taking place on the Forest.
2. Increase technology transfer and outreach.
3. Foster increased dialogue among and between researchers and managers.

This paper describes our experiences with each of these, and discusses lessons learned.

Boundary Spanner Task #1: Coordination of Research Activities

In 2001, the Forest started using the special use permit system to keep track of researchers working within the Forest's boundaries. This requirement was unique in the Northern Region and rare elsewhere. Each researcher was required to apply for a permit and provide a study plan and map. The boundary spanner reviewed the study plan, checked for overlap with other research studies, and coordinated reviews by the botanist, heritage program manager, and wilderness program manager. Then the appropriate district ranger signed the permit, and the boundary spanner made copies of the permit and study plans available to the other districts. Depending on the completeness of the study plan and other materials, and the rangers' availability, permits took from a week to four weeks to get signed. We never denied a permit, although we did ask for modifications to protect resources.

Previous to the research permit system, the Forest had research projects going on within its boundaries that the district rangers didn't know about and hadn't approved. Often, we didn't even receive reports on research that took place on the Forest, sometimes not hearing about it until seeing a publication years afterwards. We created a list of research projects that we posted on our website including summaries of objectives. Having a person track the projects kept Forest employees informed and other researchers learned about existing projects that might overlap theirs. The public also learned about various projects this way.

We also created a GIS map showing all study site locations and provided a copy to each Forest district (fig. 1). This helped in two ways. First, when planning a project such as a timber sale or weed-spraying, they could check to see if there might be any conflicts with

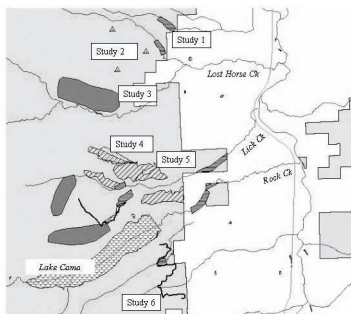


Figure 1. A portion of the Bitterroot National Forest research map showing locations of 6 study sites. This area also has active forest management and recreational use. For scale, Lake Como is 3 miles long. Illustration by Sharon Ritter.

research sites. Second, when someone came across study site markers on the Forest, they could figure out whose study sites they were. Recently, the Forest started NEPA analysis on a prescribed burn. When we noticed that the burn would take place on a researcher's study area, we contacted him to find out whether this would prove to be a problem, and might have to be postponed. It turned out that this researcher needed to burn his plots after the first year of data collection anyway, which would have required NEPA analysis, so this particular project worked out perfectly for all of us.

Tracking research on the Forest provided direct benefits to the researchers. We let them know ahead of time about road and area closures, so they could arrange their work to avoid them. During the two years we were most actively involved in burned timber salvage operations, we knew which researchers were going to be where, and helped them contact the sale administrators when they needed to enter a timber sale area otherwise closed to the public. We provided safety training and notices, informed them of our closed gate policy, provided sensitive plant lists, and cloned radios for them (with some restrictions). We provided them with data, maps, GIS layers, and aerial photos to help plan field work and complete data analysis.

An especially important part of the boundary spanner's coordination work was letting researchers know of other research and management activities going on. This led to more communication among the researchers, so that they could benefit from each other and avoid duplication of effort and overlap of study sites. For example, we had two projects studying debris flows, and one of the researchers was excited to learn about the aerial photos taken by the other researchers. Fire history maps, burn severity maps, and other data compiled by some researchers saved others much time and effort. Without the boundary spanner being aware of all of the projects, these researchers might not have heard about the efforts of others for years afterwards.

Some researchers at first resented having to apply for a permit. Other researchers recognized the value of managers knowing what research was going on and where. One researcher eventually was saved from having control sites logged thanks to our research map showing study site locations. In another case, we had three research sites in areas the Forest planned to treat for noxious weeds. We arranged to delay treatments there for a few years until the research field work was completed.

Because researchers aren't always aware of the workings of a national forest, they occasionally expected the boundary spanner to have more control and knowledge of activities than a person in that position could have. Despite a few mishaps where a researcher's study site

markers were removed, we've been generally successful at protecting researchers' plots. During the Burned Area Recovery project, we asked researchers to let us know if any of their plots in the burned areas needed to be protected and designed projects to avoid those sites.

Lesson Learned #1

Try to make researchers aware of the boundary spanner's duties and limitations, that they're in a working Forest not an experimental one, and that a district ranger has jurisdiction over what activities take place on the district. This conversation needs to be up front, perhaps relayed in a website or as part of the permit approval process. Also, as part of the permitting process, it would help to have the researchers describe how they will mark their plots. We had to send one researcher back out into a wilderness area to paint over the fluorescent orange paint used on trees to mark plots. If we had known ahead of time what he planned to do, we would have told him this type of marking wasn't appropriate in a wilderness area.

Lesson Learned #2

The Forest found that having someone track research projects was valuable and recommends that if you can swing it, with or without permits, do it. It's worth it for both sides, whether you have five or 50 studies. The research study site map was particularly useful for keeping track of projects.

Boundary Spanner Task #2: Increase Technology Transfer and Outreach

Forest Service resource managers rarely get funded to go to conferences, and when they do, they usually attend ones specific to their resource. But in their jobs, they must manage across disciplines, and the more they understand about those various disciplines and resources, the better they will be able to manage our public lands. In addition, they want to use the most up-to-date research available. Scientists in turn are interested in providing research that is meaningful and useful to land managers.

The boundary spanner helped increase the level of technology transfer and public outreach conducted by researchers working on the Forest. We had field trips involving researchers and resource managers, and others including members of the public. We had a full day of research presentations, and several smaller sessions with one to three researchers talking. We created

posters and displays, posted the list of research projects on the Forest's website, added information about current research projects to our annual monitoring report, connected researchers with other community groups, and provided research story ideas to newspapers and television.

Field trips were very successful for managers, researchers, and the public. An example of one field trip was to a Research Natural Area where the Forest and researchers from the Rocky Mountain Research Station and University of Montana have been treating grasslands with herbicides and prescribed burning and adjacent low elevation ponderosa pine forest with thinning and prescribed burning (fig. 2). A ranch manager attended another field trip there a few years earlier, and encouraged by the results that were monitored by the researchers, subsequently treated more than 6,000 acres of a nearby ranch in a similar way (fig. 3). Our field trip included the ranch treatment areas, and comments back from both the public and land managers were all positive.

The one-on-one chance to interact on these trips, in the field, is extremely important. It fosters connections, and encourages conversations that lead to new research questions and increased use of existing research. It gives the researchers feedback on how research is being used, whether it's providing practical information, and a feeling of appreciation for what they are doing. For managers, the personal connection with the researchers increases their interest in the studies, and gives them a chance



Figure 2. Researchers monitored results of thinning, weed control, and an understory burn at the Sawmill Research Natural Area. Success of these treatments encouraged the neighboring Burnt Fork Ranch to apply similar treatments. Photo by Mick Harrington.



Figure 3. Private forester Craig Thomas reports on the Burnt Fork Ranch treatments to a group of resource managers and members of the public on a field tour. Photo by Janie Canton-Thompson.

to ask questions about past research such as how it applies to other situations, and to learn about preliminary observations from current work. When members of the public attended, they added another dimension to the discussions, showing researchers what the public's concerns and questions are, and helping them comprehend that there are other factors besides science behind land managers' decisions.

Lesson Learned #3

Don't shy away from field trips. They take time to set up and advertise, and have a limited "distribution" compared to, say, a research report. But the benefits are worth the effort on many levels. By getting media coverage, you can increase the dissemination of the information, and word-of-mouth from the attendees also serves to disseminate results.

The benefits of locally held seminars weren't as clear. The turnout wasn't as good as we had hoped, from either the public or the resource managers, although those who did attend were excited and appreciative afterwards. We expected more resource managers to jump on the chance to get a personalized presentation right in their own area. The most successful event we had was when we scheduled eight speakers in a day. This allowed for interdisciplinary learning, and the researchers enjoyed the interaction also. The full day of talks may also have been important enough to the managers to keep them out of the field for a day, whereas a noontime seminar may have cut into their day too much.

Lesson Learned #4

If your target audience is resource managers, hold the seminars during the day, and schedule multiple talks in one day.

An important part of the research special use permit was a requirement that researchers provide the Forest with copies of any reports resulting from the research on the Forest. As projects concluded, the coordinator checked researchers' websites and contacted them to be sure we received publications. We added these to the Forest's planning library, so that in the future, when we designed management projects, we had easy access to locally derived information. Often, in the past when we did receive reports, they went into the files of a few specialists on the Forest, rather than put in a library and indexed so they were available to everyone.

Some researchers were reluctant to participate in technology transfer activities because of the time involved. On the other hand, other researchers went out of their way to help disseminate results in ways most useful to the public and resource managers, which was interacting face-to-face. Researchers have different abilities to communicate results. Some are better with the public than others are, some are better at writing than public speaking. Similarly, managers and the public have different learning styles. Some prefer to read publications; others learn better listening to talks or being on a field trip.

Lesson Learned #5

Everyone is busy. Make the best use of each person's time to disseminate information in a way that works for both sides of the boundary.

The boundary spanner took on some additional tasks to help the Forest and the Rocky Mountain Research Station. When resource managers needed scientific information for management analyses, the boundary spanner helped find publications and directed the managers to researchers familiar with the particular issues. Currently, Forests throughout the west are putting together green fuel reduction projects that will involve thinning, prescribed burning, or a combination of the two. The Rocky Mountain Research Station and the Forest agreed to have the boundary spanner work on an annotated bibliography of Northern Rockies research studies looking at the effects of these types of treatments on various resources such as soils, wildlife, and water. The bibliography of approximately 250 papers is annotated because of the difficulty many forest resource managers have in obtaining copies of publications, especially people working in remote areas. This bibliography was a direct response to the needs expressed by the managers, and was starting to get used as soon as people heard it was underway.

Boundary Spanner Task #3: Fostering Increased Dialogue Among and Between Researchers and Managers

Researchers don't want to work in a vacuum. They want to be sure that their proposed research will be useful to managers, and that their completed research is getting out there and used. Managers are frustrated when research doesn't meet their needs. The boundary spanner's third task was to help build closer relationships that would result in improved communication. Researchers and land managers have visited both formally and informally through field trips, seminars, and special meetings that gave them a chance to share ideas and concerns, and to learn more about each other.

Understanding each other is an important part of communicating. In a 1997 report resulting from a workshop held at the Rensselaerville Institute in New York, *Integrating Science and Decisionmaking: Guidelines for Collaboration Among Managers and Researchers in the Forest Service*, the two cultures are described this way:

Culture of Research

- Time horizons are often long.
- Interest is in findings that can be generalized outside the study area.
- Rewards come from publication and peer recognition.
- Freedom of inquiry is expected.
- Validation often comes from outside the agency.
- Science is less a statement of truth than a running argument.
- Scientists accept that things will change.
- Science thrives on contention—the more questions, the better.
- Researchers expect explicit assumptions.
- Researchers express findings as probabilities.

Culture of Management

- Time frames are often tight.
- Closure of issues is desirable.
- Clients are often contentious.
- Operations are driven by specific objectives.
- Work is performed in a fishbowl.
- The public must be involved in decision-making.
- Decisions are based on many factors, one of which is science.
- Definition of acceptable risk is part of the job.

The boundary spanner's goal is to build a bridge between these two cultures so that they can understand, trust, and respect each other.

Thanks to the efforts of BEMRP and the boundary spanner, managers have helped direct research toward questions important for managing resources. Researchers appreciate that managers recognize their research efforts and sincerely want to make use of the results of their work. Some funding sources, such as the Joint Fire Sciences program, place a strong emphasis on coordination with a land management agency. Researchers that maintain close communication with the Bitterroot National Forest benefit from these relationships.

Lesson Learned #6

Spend time developing personal, one-on-one contact with the researchers, and foster interaction between the researchers and resource managers. While this may not be feasible in many areas, where the two groups are located near each other such as we are in the Bitterroot, this is valuable. It's easy to stick with your own kind, researchers hanging out with researchers and managers hanging out with managers. It takes an effort to cross that cultural boundary, but is important.

What Makes a Good Boundary Spanner?

Lesson Learned #7

Each person who might serve in a position as a boundary spanner will have weaknesses and strengths. Here are some qualities that a boundary spanner should have:

1. Strong interest in research and familiarity with the scientific method. A boundary spanner needs to know what scientists need to design and carry out a successful, scientifically sound research project.
2. Strong interest in learning in multiple discipline areas, and the capability to do so.
3. Minimal pre-existing biases against either researchers or land managers.
4. Willingness to spend time getting to know the organizational structures and cultures of the two sides of the boundary, and willingness to learn about constraints and reward systems of each. Feel free to hire an "outsider," someone who isn't so ingrained in either research or management that she or he can't step back and understand both sides.

5. Good communication skills, both in writing and in speaking. This includes someone who is a good listener and is able to effectively communicate by e-mail and phone.
6. Diplomatic skills--someone who people feel they can trust. The boundary spanner will receive confidences from both sides of the boundary, and must be able to enhance understanding and resolve conflicts without betraying those confidences. The boundary spanner also needs to use tact when dealing with conflicts and various personalities.
7. Willingness to make the effort to get to know people on both sides of the boundary. This may require having a work space in both locations, so that they can interact with both groups in informal as well as formal ways. The boundary spanner needs to be able to empathize with both sides of the boundary, and this requires taking the time to get to know the individuals.
8. Good organizational skills for tasks like setting up meetings, field trips, and seminars, and tracking multiple research projects.
9. Willingness to be connected to the larger community served, whether it's the public, environmental educators, school teachers, nonprofits, regional office of the Forest Service, director's office of the research group, or other groups. This networking is very important for success in technology transfer and outreach.

Applicability Elsewhere

The Bitterroot National Forest is lucky to have so much local research taking place and access to such a fine cadre of researchers. This is thanks in part to being close to the University of Montana and Rocky Mountain Research Station. The Forest's mix of managed land and relatively unmanaged wilderness areas, its variety of habitat types, and several long-term data sets make it an ideal laboratory.

One question is how would our lessons learned apply to a more remote location, perhaps one so remote from research stations and universities that only a few studies take place and researchers visit infrequently? Having someone designated as a boundary spanner who can keep track of projects and help with technology transfer is important for every land management agency. How it works might vary based on the number of studies and accessibility to researchers. In some cases, a regional office might need to take on more of the boundary spanner technology transfer role. The individual management units, however, should track the projects and take advantage when any of the researchers show up. By the nature of their jobs, these scientists are up-to-date on literature and genuinely interested in sharing their results and learning about what kind of information resource managers need to effectively manage the lands under their care.