

# Planning for Restoration of Small Sites in Wilderness

This chapter provides a conceptual overview of the components of restoration planning (figure 2–1) for a wilderness setting with ongoing recreational use.

This chapter explains the concepts depicted on the accompanying flowchart, *A Process for Small-Site Restoration in Wilderness*. Chapter 3, which is more technical, will provide the restoration methodologies. This chapter serves more as the “trail map” to help you see where you are headed. Chapter 3 serves as a guide to help you get there.

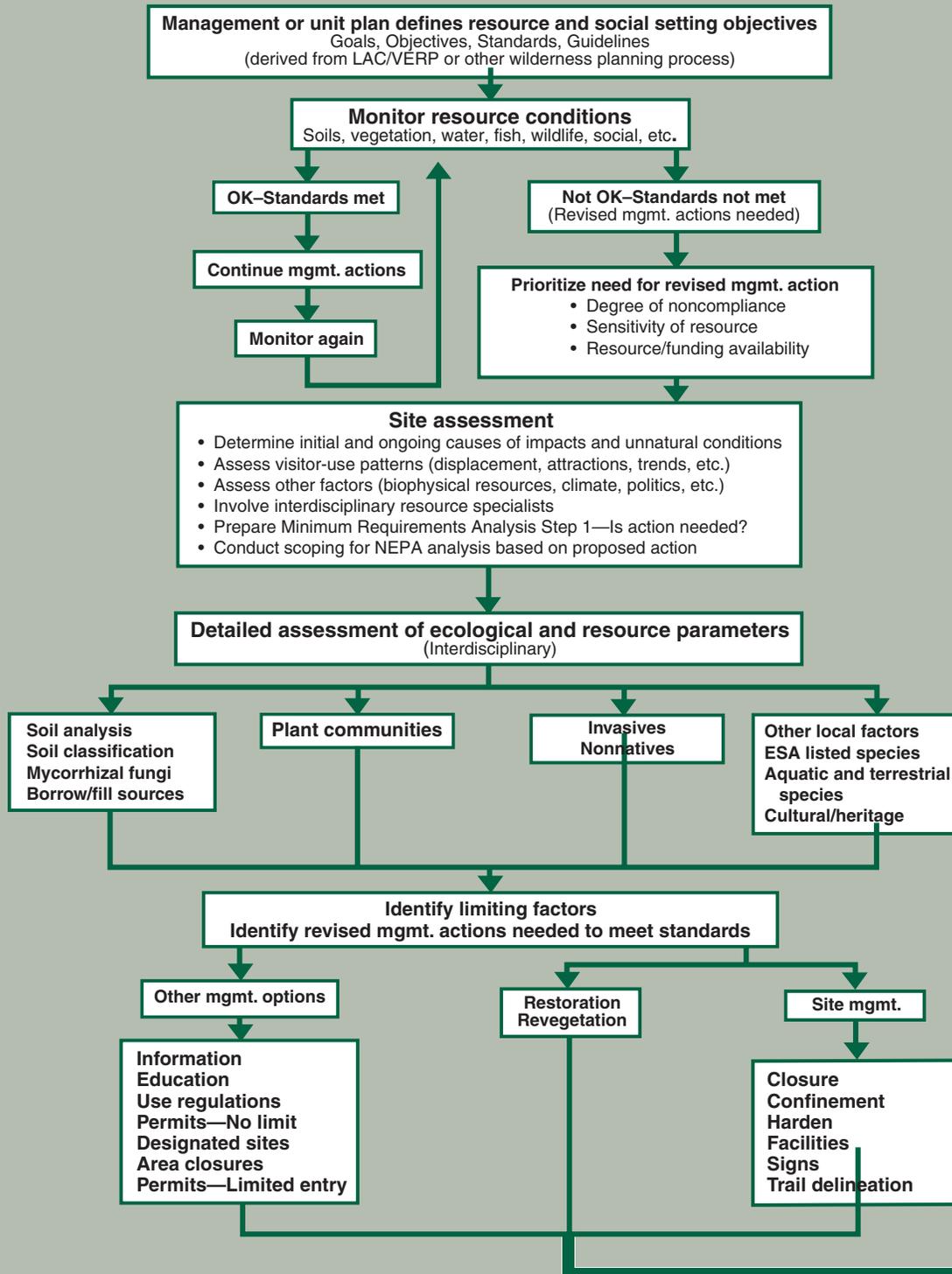
Just as there is usually more than one right way to travel to a destination, the process laid out in this chapter may not occur in exactly the same order in all restoration projects. That’s the wilderness restoration experience!

The flowchart on pages 32 and 33, developed by Tom Carlson of the Arthur Carhart National Wilderness Training Center and others, was revised by Lisa Therrell.

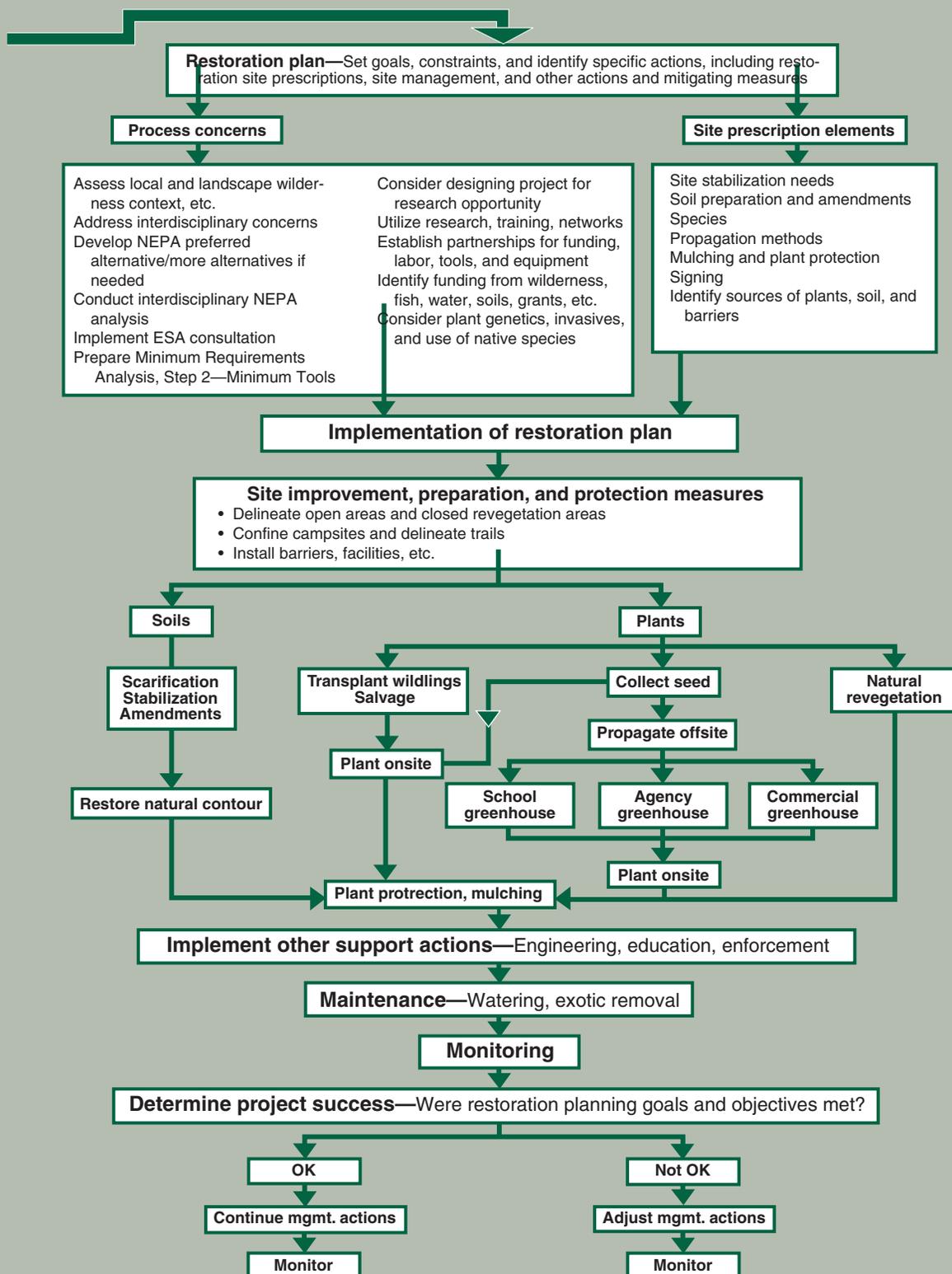


Figure 2–1—Restoration planning in the Desolation Wilderness, CA, considered the Three Es: engineering the project design to succeed, education of the public so they know how to reduce wilderness impacts, and enforcement of regulations designed to protect the wilderness resource.

## A Process for Small-Site Restoration in Wilderness



## Chapter 2: Planning for Restoration of Small Sites in Wilderness



## 2.1 Gathering the Information To Formulate a Plan

As can be seen from the flowchart, *A Process for Small-Site Restoration in Wilderness*, many factors must be considered during the restoration planning. Law, policy, and land management plans provide sideboards and the desired conditions for the land. A site assessment examines the role of historical and continuing influences, leading to proposed management actions. Designing a holistic package of management actions helps support restoration success.

### 2.1.1 Using Your Land Management Plan and NEPA

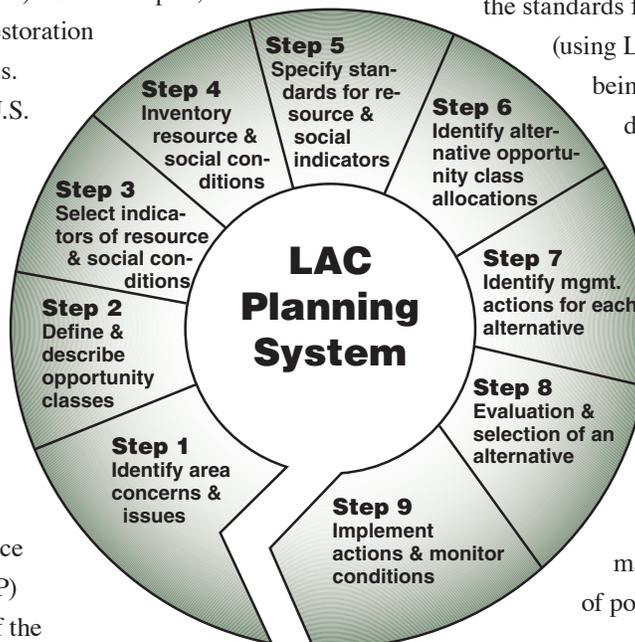
Most agencies manage wilderness and backcountry areas according to management direction provided in a land management plan. The management plan, tiered to law and policy, provides clear goals, objectives, and management standards that steer wilderness management. Development of a restoration project, as with any project on Federal land, also needs to follow the procedures mandated by the National Environmental Policy Act (NEPA). In this chapter, we will show how to dovetail restoration planning with the NEPA process.

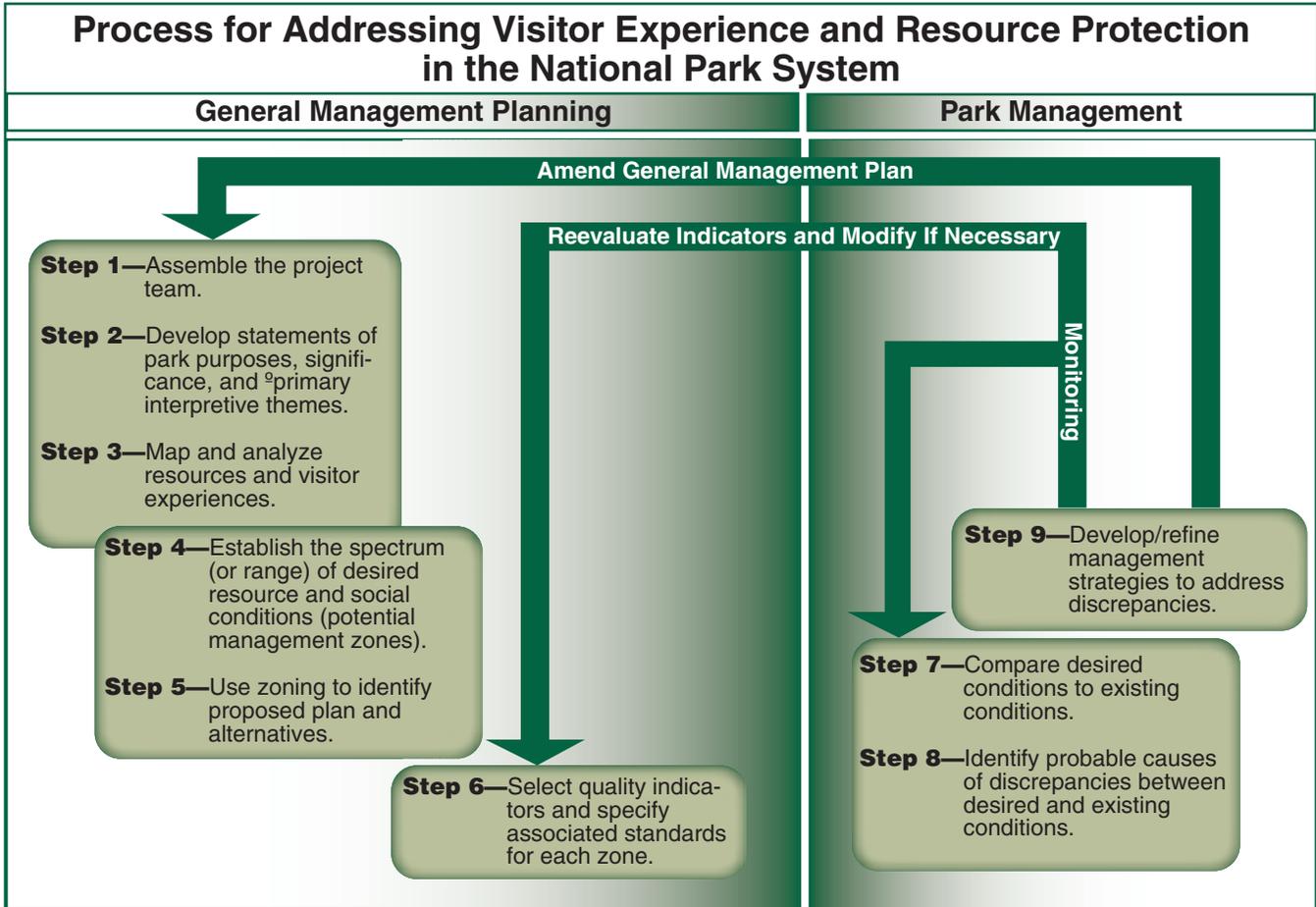
Many Forest Service and U.S. Department of the Interior Bureau of Land Management (BLM) wildernesses use the accompanying Limits of Acceptable Change (LAC) model (Stankey and others 1985) to formulate management direction. The U.S. Department of the Interior National Park Service uses the accompanying Visitor Experience and Resource Protection (VERP) framework (U.S. Department of the

Interior National Park Service 1993) for planning. Both planning systems include the concept of zones governed by indicators of condition. Management actions are selected to achieve desirable resource conditions, while preserving an appropriate social setting.

Resource conditions are monitored to determine when management actions might be needed. Restoration treatments often are considered because recreation-related campsite condition indicators such as vegetation loss, campsite density, or a site's distance from a trail or water do not comply with the management plan. Other campsite condition indicators may be based on social concerns, such as whether campers in one site can see and hear campers in another site (such sites are said to be intervisible and interaudible). These indicators are likely to have quantitatively measurable standards. Qualitative standards also may come into play, such as indicators describing the degree of naturalness or those describing the overall visual setting. Indicators based on other resources may drive the need for action. For example, such indicators might be based on riparian condition, unique plant communities, or soil degradation.

Once monitoring for an area has been completed, managers analyze whether conditions in the area comply with the standards for that zone or opportunity class (using LAC terminology). If standards are being met, current management direction may be appropriate; restoration doesn't need to be considered (See the flowchart, *A Process for Small-Site Restoration in Wilderness*, at the beginning of this chapter.). If conditions in the area do not comply with management standards, revised management actions are needed. Vegetative restoration may, or may not, be part of the mix of possible solutions.





### 2.1.2 Using the Minimum Requirements Decision Process

If a proposed project is in congressionally designated wilderness, the first step is to ask the question—“Is administrative action needed?” This question is the first step in the Minimum Requirements Decision process, developed to ensure compliance with the intent of the Wilderness Act and agency policies. The *Minimum Requirements Decision Guide* is available from the Arthur Carhart National Wilderness Training Center (Arthur Carhart National Wilderness Training Center 2004) and on the Internet at <http://www.wilderness.net>. Worksheets in the guide will lead you through the minimum requirements decision process.

To oversimplify the minimum requirements concept, administrative action in wilderness is “required” when necessary to achieve the purposes of the Wilderness Act, such as:

- Allowing for natural processes, solitude, and primitive and unconfined recreation
- Ensuring a lack of human manipulation and permanent structures
- Providing for provisional uses of wilderness, such as valid existing rights
- Addressing emergencies

### 2.1.3 Planning Scale and Priorities

Planning scale also needs to be determined. Many of the national parks have developed programmatic vegetation restoration management plans covering the entire park. The Rocky Mountain National Park *Vegetation Restoration Management Plan*, version 2, 2006, is one example. This approach allows managers to look at all human-caused disturbances, define parkwide goals and objectives, and sort out priorities and procedures at a large scale. Individual projects are selected based on priorities. Selected projects receive site-specific planning.

It doesn't make much sense to go through the entire planning process for one campsite. On the other hand, if the plan includes too large an area, such as an entire watershed, the site-specific planning required for a successful plan (and required by NEPA) might become unmanageable.

One suggestion is to focus on one destination or trail, or on closely interrelated areas. For example, planning might be

more efficient if you consider restoration of nearby campsites when planning a trail relocation and restoration project. A number of wilderness projects have employed this strategy quite successfully. The planning area should be large enough (figure 2–2) to address the problems created when users are displaced to other areas nearby.

Determining which projects receive priority depends on resource management objectives, conditions in the planning area, budgets, and compatible opportunities. It would be easy to say that the most serious problem should be your first priority. But there may be too many constraints to solve the most serious problem right away. The constraints may be financial, biological, logistical, financial, or political. For your first projects, consider choosing ones where your chances of success are fairly high. Another approach would be to choose projects that address small pieces of a complex problem. As you learn from your successes, you can move on to more challenging projects.



Figure 2–2—The planning scale should be large enough to address problems that arise when users are being displaced from closed areas.

### 2.1.4 Forming an Interdisciplinary Team

Persons knowledgeable about any resources potentially affected by a proposed project need to be included on an interdisciplinary team. At a minimum, a typical Forest Service team would include the recreation or wilderness manager, an archeologist or cultural resource technician, a botanist, and a soil scientist (figure 2–3). Additional support may be needed from a landscape architect, wildlife biologist, fisheries biologist, hydrologist, engineer, or trails specialist. The team will identify and gather any additional resource data or visitor-use data needed.



Figure 2–3—An interdisciplinary team field trip will help build a mutual understanding of human-caused impacts and viable solutions.

### 2.1.5 Developing a Site Assessment

The next step is to develop a more detailed assessment of the planning area. The purpose of the site assessment (figure 2–4) is to gather the information for a clear problem statement and site-specific proposed action. A quick initial assessment may be followed by a more exhaustive assessment. During the site assessment process, you will gather all the information needed to formulate the preferred alternative (NEPA terminology) and write a detailed restoration plan. The restoration plan also will include other supporting management actions.

The next chapter will provide technical background to help you evaluate erosion, soil, and vegetative conditions as part of your site assessment. The remainder of this chapter will help you identify and correct problems caused by human use, so your plan can address not just the problems, but their causes.



Figure 2–4—Restorationists Joy Juelson and Greg Shannon collaborate on a site assessment for Juelson’s research project in the Alpine Lakes Wilderness, WA.

### 2.1.6 Assessing Historical Human Influences

The team will determine the initial and ongoing causes of resource impacts. Don’t assume that the impacts you see today are from current recreation use patterns—take enough time to research past uses of the area that may have contributed to current conditions. Even if a specific use ended long ago, you will want to understand the full context of impacts caused by human use. This research also will help identify cultural sites you may not wish to disturb with a restoration project.

Historical influences might include grazing, old sheep camps, use by large groups, old developments such as roads or mines, logging (yes, even in wilderness), homesteads, administrative sites, airfields, or damage by off-road vehicles. In some cases, an area may continue to erode or noxious weeds may continue to spread, even after the original cause of the problem has been eliminated.

Your staff archeologist may help you find relevant information sources. You may wish to consult agency heritage resource files, range records, local historical

libraries, local history books or memoirs, and expedition journals. Local residents, oldtimers at your work unit, and former employees also are excellent sources of information.

### 2.1.7 Assessing Current Human Influences

Impacts may be declining because of changes in use. Perhaps conditions have stabilized to a new norm. Thorough observation and analysis of current human use patterns is

#### *A Lesson Learned the Hard Way*

*One week, I hiked to Lake Mary in Washington's Alpine Lakes Wilderness, joining the restoration crew to plant a site we had designed as an experiment to test the effectiveness of inoculating planting holes with mycorrhizal fungi (figure 2-5). Working together, we were planting specific numbers of several species in a grid pattern, mixing a spoonful of inoculum into half the planting holes. While we were planting the site with greenhouse-grown stock, I was surprised to feel a very sharp angular chip of stone that was not characteristic of the powdery ash-based soil. Taking a close look, I recognized the tiny chip as a lithic flake—a byproduct of making arrowheads. A thoughtful debate on whether to stop or continue our work followed. Because the site had already been disturbed with a restoration treatment 10 years before, we continued our work. This taught me the importance of making sure an archeologist or cultural resource technician visits each site before treatment.*

*Lisa Therrell*



Figure 2-5—Inoculating planting holes with mycorrhizal fungi.

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essential. The restorationist or wilderness manager needs to be part psychologist or sociologist, gaining a feel for the management tactics that might succeed or fail based on an understanding of the local clientele. Future management actions will be based, in part, on these determinations.

Identify the regulations that are in place. How are these regulations helping your situation? How might they be making things worse? Are additional regulations or adjustments needed?

Look for situations where management direction or regulations do not complement the indicators or standards, resulting in noncompliance. For example, the Alpine Lakes Wilderness in Washington has a campsite vegetation loss standard of 400 square feet (about 37 square meters) or less.

The group size limit, including stock, is 12. Groups of 12, especially those with stock, occupy and impact larger areas than allowed by the standards. In fact, any group with a large wall tent will impact more vegetation than allowed by the 400-square-foot (about 37-square-meter) standard. Such discrepancies need to be addressed during the planning process.

It is helpful to think of the larger project as a series of miniprojects. Assign each campsite and trail segment (or other feature) a unique number, cross-referenced to a map (figure 2–6). The number allows each feature to be tracked all the way through planning, implementation, and monitoring. The project area map needs to be detailed enough that each campsite and trail segment can be identified on the ground. Be sure to indicate key features such as north, the

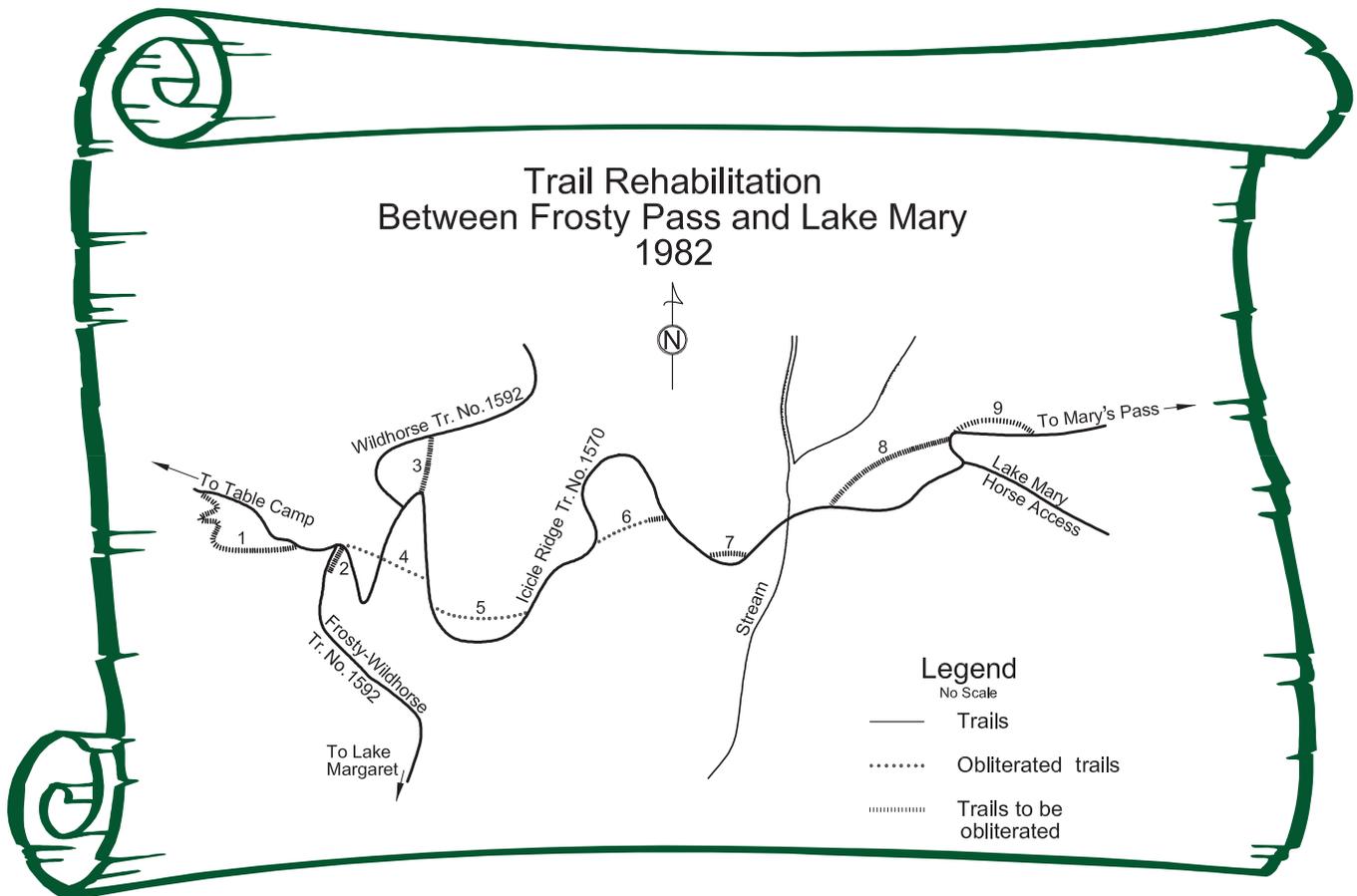


Figure 2–6—One example of a project map.

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direction of waterflow, system trails, the direction to system trails, and so forth. It may not be possible to map every single social trail at this scale; more detailed site maps will show the trails. Establish photopoints, so you can use a series of pictures of impacted campsites and trails to show changes in their condition. Your numbering system will allow you to identify each site.

It pays to study human use patterns in an area. Hang out and watch what people do during peak-use periods and during different parts of the use season.

- Who are the users?
- Where do users wander when they select a campsite?
- Which campsites receive the most use?
- Are all campsites occupied during peak-use periods?
- Does campsite occupancy change use patterns (forcing visitors to bypass the occupied sites when accessing areas of interest, for example)?
- Do groups avoid camping in campsites that have impacts?
- How and where do users access water, fire-wood, and toilet areas?
- How do fishing and other area attractions affect trail and campsite development?
- What other seasonal conditions influence use patterns? High water? Seasonal snowmelt?

### *Evaluating Snowmelt Patterns*

For any wilderness with winter snow cover, the early-season snowmelt is a pivotal time for assessing impacts. When the ground is partially covered with snow, visitors will select campsites and travel routes differently than when the ground is bare. They may walk or camp on vegetation because they can't find the main trail and camps, forming duplicate sites and trails (figures 2-7a and 7b). Restorationists will want to avoid closing the first trails and camps that become snowfree. Document your findings with photos and maps.



Figure 2-7a—Would you believe that the Pacific Crest Trail could still be covered with snow on Labor Day weekend?



Figure 2-7b—Two additional trails were formed to skirt the snow. This problem can be avoided with careful planning, but you have to survey conditions in the early season when the snow is beginning to melt off trails and camps.

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Presence or lack of shade during the hot months? Access to water?

- How do current regulations and other management strategies shape these patterns?

Review use statistics for the area. Are use levels stable, rising, or falling? Have the types of users changed over time?

What behaviors, use levels, or conditions need to change to bring the planning area back into compliance with standards or management objectives?

Each specialist will contribute to the assessment based on his or her discipline. Chapter 3 discusses a process and method for completing a soil and vegetation assessment. Assuming that restoration might be part of a proposed action, the focus is on comparing the damaged sites to one or more reference sites to determine what is missing and what can realistically be restored.

The information gathered for the site assessment is quite specific. Plant species and the distribution of native plant communities are noted. Potential site treatments are based on soils, vegetation, and use patterns. An archeologist or cultural resource technician needs to survey any sites that might be slated for ground disturbance or another action that might affect heritage resources. Native sources of plant material, rock, and quantities of nearby fill are noted.

In short, any factors that could limit project success are identified. Appendix A, *Treatments To Manage Factors Limiting Restoration*, lists potential factors that limit restoration success, along with the corresponding treatments.

### 2.1.8 Problem Statements

It is helpful to write a problem statement to focus planning. This brief statement includes the location of the project, description of the impacts addressed by the project, causes of the impacts, the magnitude of the impacts, and any special considerations. A sample problem statement would be:

**The project area is on the south shore of Cradle Lake (figure 2–8), between Trail No. 1550 and the lake. It involves two campsites, totaling about 4,000 square feet (about 372 square meters), six social trails, and an area where horses are tied for short periods. These sites are now the best options for camping with stock at Cradle Lake, even though they are inside the 200-foot (about 61-meter) setback where camping is not allowed. Cradle Lake also has a 200-foot (about 61-meter) campfire setback from the lakeshore. Illegal fires and stock camping continue to be a problem. Campsite sizes do not conform to standards. The campsites and social trails, highly visible from most portions of the lake basin, are not in conformance with visual standards.**



Figure 2–8—Cradle Lake in the Alpine Lakes Wilderness, WA.

### 2.1.9 Scoping the Proposed Action

Fairly early in the interdisciplinary process, the team will formulate a proposed action (NEPA terminology) describing the purpose for the proposed project, the project location, and the types of actions that might be taken. At this point, the proposed action is specific to a particular area, but doesn't go into excruciating detail. For example, enumerate

exactly which campsites will be closed for restoration. The proposed action is included in a letter and mailed to the concerned public as a part of scoping for the NEPA process. Scoping is the stage when concerns about the proposed action and possible mitigating measures are identified.

Based on the Cradle Lake example, a proposed action might look like this:

**The proposed action includes the following strategies:**

- **Relocate Trail No. 1550 to a more durable location through talus on the other side of the lake.**
- **Retain the portion of the old system trail needed to provide lakeshore access.**
- **Restore the portion of the old system trail where it leaves the lake to climb toward the pass.**
- **Close and restore the two large lakeshore campsites.**
- **Direct users to camp on benches away from the lake and at a nearby stock camp.**
- **Close four of six social trails.**
- **Harden the two remaining social trails to provide durable lakeshore access.**

Your agency may have a standard scoping mailing list. Work with your team to identify other interested parties, such as local user groups, wilderness advocates, native plant societies, or outfitters and guides. Your scoping process also may include public meetings, club meetings, field trips, articles for newsletters, or press releases. You may need to contact representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. They are expected to consult on the project if threatened or endangered species or their habitats could be affected.

### 2.1.10 Selecting Management Actions To Meet Standards

During this stage of planning, your team will identify the appropriate management actions needed to help the planning area meet wilderness standards or other applicable standards. Even though we often start a planning process with restoration in mind, don't assume that restoration is the answer. Other options may be more desirable or appropriate. The process of selecting the best management actions begins with studying the range of options, then choosing options that best complement each other to form an appropriate holistic solution. Even though it is tempting to rush ahead to plan a restoration project, back up a few steps to ensure that you have considered all options.

You have already determined that administrative action is necessary, the first step of the *Minimum Requirements Decision Guide* (Arthur Carhart National Wilderness Training Center 2004). The next step is to determine the minimum tool. This step requires answering four questions.

- What are the alternative methods for solving the problem?
- What are the effects and benefits of each method?
- What is the minimum tool and the rationale for its selection?
- What operating requirements will minimize impacts?

This section will discuss the first three questions.

### 2.1.11 The Minimum Tool

Sometimes the concepts of "primitive tool" and "minimum tool" are confused. Part of the tradition of wilderness management includes using primitive tools. Essentially, primitive tools are the tools used during the settlement of America. Based on the language of the Wilderness Act, primitive tools don't have motors and don't have wheels (even though the wheel itself is primitive). Our expert use of these

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tools and techniques preserves a disappearing slice of our heritage, representing one of the enduring cultural and historical benefits of wilderness.

On the other hand, the minimum tool may not be primitive. The minimum tool represents the minimum action necessary, within the context of wilderness values, to meet management direction or to accomplish other administratively necessary activities. The minimum tool may refer to tools, such as a type of saw, drill, or transportation. Or it may refer to actions, such as the degree of signing, regulation, or physical development in wilderness.

At this stage, consider all the available options. Some methods may not appear to be feasible initially, but conduct some research before reaching conclusions.

Management direction and policy will help frame the options that are appropriate. Many wilderness areas are zoned into “opportunity classes” using the LAC process. The types of management actions identified as acceptable in a transition or semiprimitive zone might be considered unacceptable or possibly a last resort in a primitive or pristine zone. For example, obvious barriers and signs to delineate trails and campsites may be appropriate in the transition zone, but those techniques are inappropriate in a pristine zone.

Public support also will shape the selection of management options. In one study of high-use wilderness destinations, visitors showed low support for limiting use and high support for intensive campsite management techniques, including active restoration (Cole and others 1997). A similar study, using an exit survey of persons who had visited heavily impacted wilderness locations, found that 71 percent did not view agency management favorably. When visitors were surveyed after visits to areas with restoration work in progress, 74 percent reported “positive” to “extremely positive” views of management (Flood and McAvoy 2000).

Before beginning a restoration project, contact users or groups that might be displaced by change (figure 2–9). They may suggest a better alternative that addresses public desires and wilderness protection. In the Seven Lakes Basin of the

Selway Bitterroot Wilderness, ID, local stock users suggested a number of ideas that allowed continued limited stock use of fragile subalpine lake basins (Walker 2002).



Figure 2–9—“I love this place—We do, too.”

These publications will help guide your wilderness impact analysis:

- *Minimum Requirements Decision Guide* (Arthur Carhart National Wilderness Training Center 2004)
- *Managing Wilderness Recreation Use: Common Problems and Potential Solutions* (Cole and others 1987)
- *The Limits of Acceptable Change (LAC) System for Wilderness Planning* (Stankey and others 1985)

### 2.1.12 Types of Management Actions

The challenge facing wilderness managers is to develop methods of handling problems that not only address the symptoms, but solve the underlying problems. We will need public support for our new tactics. To borrow vernacular from off-highway vehicle managers, we need to address “The Three Es”—engineering, education, and enforcement. We engineer the project’s design so it will succeed, we educate to

persuade visitors to practice new behaviors, and we enforce regulations when visitors don't comply.

Wilderness research scientist David Cole (Cole and others 1997) suggests three broad categories of management actions for reducing recreation impacts:

- Reducing recreational use
- Changing visitor behavior with information and education
- Managing sites intensively by controlling recreational use patterns and restoring damaged sites

Each category of actions has strengths and limitations. Your proposed actions are likely to include a mix of these categories of action as you craft a viable management solution.

### 2.1.12a Reducing Recreational Use

While limiting use is commonly accepted in the national parks, it is generally seen as a draconian measure in national forests. Limiting use may be the only way to stabilize or reverse impacts to soil and vegetation, especially in areas with too few campsites to support the existing overnight use. Limiting use is not only politically unpopular, it could exclude some users from wilderness and may displace users to other areas. The displaced users could increase the environmental and social impacts at those areas.

The large volume of literature on permit systems should be reviewed carefully before considering limits on use. Nonetheless, it is always appropriate to ask whether the level of use is contributing to the problem. If resource impacts cannot be stabilized at current use levels, reducing use becomes a minimum tool.

An indirect method of reducing use is to lengthen the approach to an area—usually by closing a road to lengthen trail access. Many wilderness visitors will oppose the mere suggestion of lengthening access. However, this management action may complement other objectives, such as reducing road mileage for wildlife habitat needs or reducing the costs of road maintenance.

### 2.1.12b Changing Visitor Behavior With Information and Education

The strategic use of information and education can, over time, change unnecessary or discretionary high-impact behaviors, such as littering or damaging trees. However, intensified educational programs are unlikely to reverse damage to vegetation and ongoing soil erosion. It is difficult for many visitors to grasp the impact of their individual actions. Changes to old ways, such as the tradition of enjoying a campfire, evolve ever so slowly.

If stabilizing or reversing damage to vegetation and soils is a project goal, education can be an important tool, but education alone will not solve the problem. Visitors need to be told the actions they can take to prevent further damage, such as staying in the confines of existing campsites and trails, learning to travel off trail on durable surfaces (rock, snow, or gravel), refraining from having a fire, and not removing any vegetation.

Common methods to convey information include Web sites, brochures, information on maps, trailhead posters, signs at the site, contacts by receptionists, and contacts by wilderness rangers (figure 2–10). If adequate resources are available, a more comprehensive wilderness education program may be designed. A process for wilderness education planning is available at <http://www.wilderness.net>.

#### Principles of Leave No Trace Wilderness Travel

- Plan ahead and prepare.
- Travel and camp on durable surfaces.
- Dispose of waste properly.
- Leave what you find.
- Minimize campfire impacts.
- Respect wildlife.
- Be considerate of other visitors.

(For more information, visit <http://www.lnt.org>)

