# Ecological Wilderness Restoration: Attitudes Toward Restoring the Mount Logan Wilderness

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**Abstract**—By law, wilderness areas are intended to be unmarred landscapes where evidence of modern civilization is generally absent. This presents a problem, since ecological wilderness conditions have been impaired by human activities. For example, some forest wilderness ecosystems have been altered by livestock grazing, logging, fire exclusion, and through other environmental manipulations. Additionally, there are socio-political factors that must be considered prior to discussing wilderness restoration methods. This paper focuses on the need for ecological wilderness restoration and presents options for managers to consider while discussing wilderness restoration. To determine the most preferred wilderness restoration method among communities located near the Bureau of Land Management Arizona Strip Field Office, a social survey was conducted that focused on attitudes of community residents living in proximity to the Mount Logan Wilderness, which is in northern Arizona within the Grand Canyon-Parashant National Monument. The study focused on this wilderness because an ecological restoration project was occurring outside the wilderness boundary. The survey was designed to determine the local acceptance of a mechanical, nonmechanical, or prescribed fire wilderness restoration method. Mechanical methods are often the most controversial, but survey respondents held the most positive attitude toward this method.

## Introduction

According to the Wilderness Act of 1964 (P.L. 88-577), management of wilderness includes "retaining its primeval character…which is protected and managed so as to preserve its natural conditions…with the imprint of man's work substantially unnoticeable." This statement implies that wildernesses have been protected and preserved, and that they are in a natural state. According to Cole (2000), managing wildernesses for natural conditions, which includes the absence of recent human influences, may be a desired management outcome. It is debatable if wildernesses are in a natural state, and we assert that many wildernesses have not retained their natural conditions, as human evidence in regards to past and present land manipulations are apparent in many wilderness ecosystems. Additionally, prior to the passage of the Wilderness Act of 1964, many wildernesses did not have special management provisions, therefore, they were not treated differently than nonwildernesses. Wildernesses may not be as pristine as policymakers believed 35 years ago when the Wilderness Act was passed (Brunson 1995; Cole 1996; Murry 1996). Therefore, managers are now faced with the dilemma of determining if wilderness restoration is necessary to return areas to more natural conditions, and determining ways to restore wilderness conditions through the least damaging and most appropriate wilderness restoration methods.

Proposed methods usually include mechanically reducing fuels, the use of prescribed fire, or a combination of these methods to restore the natural fire regime (Covington and Moore 1994a; Landres and others 2000). For wildernesses, these types of restoration methods may not be a popular option and would have to consider NEPA (National Environmental Policy Act of 1970) in assessing environmental impacts. Also, it may not be possible to develop ecologically, economically, and politically acceptable restoration management regimes, especially for wilderness and other natural areas (Covington and Moore 1994a). To determine the acceptability for restoration of the Mount Logan Wilderness, Northern Arizona University, with input from the Bureau of Land Management (BLM), designed a survey to determine which types of wilderness restoration methods may be considered a wilderness management option. The survey of local communities did not ask respondents if they would like to see a combination of methods. Instead, it focused on which restoration methods the local communities preferred. A local sample was selected because managers wanted to determine attitudes of residents within proximity to the wilderness and the amount of support they held toward wilderness restoration methods. Managers will have to decide, from an ecological standpoint, how wilderness restoration methods can be combined to meet restoration goals, while considering socio-political factors.

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## Wilderness Changes

Western wildernesses have changed drastically since the time of Euro-American settlement in the 1800s. To determine the ecological changes in the Mount Logan Wilderness, a forest reconstruction was completed prior to conducting a social survey. In reconstructing the wilderness, a pre Euro-American reference date of 1870 was determined and selected as the reference condition. This reference condition (date) was selected because it represented a measurable and replicable point in time, and a time previous to a large human population influx that created noticeable human impacts. For example, in southwestern ponderosa pine (*Pinus ponderosa*), Euro-American settlers introduced livestock grazing, logging, and fire exclusion, which contributed to changes in the forest structure (Covington and others 1994, 1997; Covington and Moore 1994b; Fielder and others 1996; Swetnam and Baisan 1996). The disruption of the natural fire regime created the most pervasive source of degradation in ponderosa pine ecosystems (DeMillion and Covington 2000), increased the susceptibility of insect and disease outbreaks (Kolb and others 1994), and has allowed tree densities to increase. The result is dense forests, rather than the open and parklike forests that were described by early Euro-American settlers (Cooper 1960; Covington and others 1994; Covington and Moore 1994a; Fulé and others 1997).

In the Mount Logan Wilderness, the forest reconstruction determined that the tree density in 1870 was 36 trees per acre, versus today's forest density of 571 trees per acre (DeMillion 1999). Research has shown that an increase in forest densities and fuels often leads to high intensity crown fires (Arno and others 1995; Covington and Moore 1994a,b; Covington and others 1994; Swetnam and Baisan 1996). Research results from the Mount Logan Wilderness study determined that wilderness forest conditions have been dramatically altered, which is similar to results found outside this wilderness area (NAU 1996). If wilderness managers intend to restore this wilderness to conditions that existed prior to Euro-American settlement, they must consider restoration methods in tandem with socio-political factors to decide when and how to restore the wilderness.

## Ecological Wilderness Restoration

The Wilderness Act of 1964 defines wilderness as "an area of undeveloped Federal land." Unfortunately, undeveloped areas do not always equate to unchanged or unmanipulated landscapes. The majority of western wildernesses have been manipulated by Euro-American settlers and other external influences. The question that wilderness managers need to answer is, should restoration methods be used to replicate conditions previous to modern human impacts? If wilderness restorative actions are taken, the sense of wildness and the belief that an area is free of human manipulation is compromised (Landres and others 2000). If actions are not taken, high intensity fires will start in wildernesses and spread beyond their boundaries to rural and urban communities.

Two examples of fires in 2000 that began in wildernesses are the Cerro Grande (Bandelier National Park) fire that interfaced with Los Alamos, New Mexico, and the Clear Creek (Salmon-Challis National Forest) fire that began in the Frank Church Wilderness of No Return and spread to Panther Creek along the Salmon River in Idaho. Both fires started in wilderness and spread from wildland areas to urban or rural communities destroying structures and in some instances livelihoods. Fuel loadings within and outside of the wilderness boundaries in both locations were similar and the fires did not stop at the administrative boundaries. Due to the heightened awareness of fire and other factors, some land managers are beginning to explore the socio-political concerns that the public holds toward restoring wildernesses. Managers of the BLM Arizona Strip Field Office wanted to conduct a survey to determine the range of alternatives and the types of wilderness restoration methods that might be acceptable to local community residents.

### Mount Logan Ecological Wilderness Restoration Methods

Community residents within proximity to the Mount Logan Wilderness were surveyed to determine their attitude toward mechanical, nonmechanical, and prescribed fire wilderness restoration methods. Within the survey, a mechanical method was defined as any activity where machines are used to cut and/or transport personnel or material. An example of this would be the use of chainsaws to reduce small diameter trees, decrease ladder fuels around old growth trees and snags, and create fuel breaks. Mechanical methods could also include the use of motorized equipment and vehicles with wheels or tracks. A nonmechanical method was defined as any activity that involved a living power source, for example, the use of a handsaw, hand rake, or horses. A prescribed fire method was defined as intentionally igniting and controlling fires. This definition is different from the national definition that described prescribed fire as "any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met prior to ignition." This definition was not used because the terminology may have been confusing, it may have been too lengthy, and it does not refer to prescribed fire as a restoration method.

### Attitudes Toward Wilderness Restoration Methods

The Arizona Strip Field Office, BLM and Northern Arizona University surveyed communities within proximity to the Mount Logan Wilderness about their attitude toward wilderness restoration methods. The wilderness is within the Grand Canyon-Parashant National Monument in Arizona and was selected because an ecological restoration project was under way in areas outside the wilderness boundary. The closest communities to the wilderness include St. George, Kanab, and Hurricane in Utah, and

Fredonia and Colorado City in Arizona. Residents within these communities were selected to respond to a survey about the use of mechanical, nonmechanical, and prescribed fire wilderness restoration methods. Managers wanted to determine the attitudes that local community residents held toward these specific wilderness restoration methods.

To conduct the survey, a mail-back questionnaire was designed, pre-tested, and sent to a random sample of 1,000 residents. Questionnaires were sent to 500 residents of St. George, Utah (urban sample), with another 500 sent to residents in two rural communities in Utah (Kanab and Hurricane) and two rural communities in Arizona (Fredonia and Colorado City). The overall survey response rate was 55 percent. There were no significant differences in attitudes toward ecological restoration treatments between respondents in the urban and rural samples.

**Attitudes Toward a Mechanical Treatment**—The most favorable response was for the mechanical method, with 74 percent of the respondents holding a positive attitude (table 1). We suggest that positive attitudes toward a mechanical method are likely to be higher among local communities than among residents from a regional or national sample. Research on attitudes has shown that the more familiar people are with an attitude object (subject), the more supportive they are toward that object (Bruvold 1973; Chaiken and Stangor 1987; Fazio 1982). In other words, residents of the communities we surveyed may be more familiar with the use of mechanical methods, and therefore may have a more positive attitude toward them.

**Table 1**—Attitudes toward the use of three restoration methods in the Mount Logan Wilderness.

| Type of wilderness restoration treatment | Positive | Negative |
|---|---|---|
| | ------ *Percent* ----- | |
| Mechanical | 74 | 15 |
| Nonmechanical | 54 | 32 |
| Prescribed fire | 55 | 33 |

**Attitudes Toward a Nonmechanical and a Prescribed Fire Treatment**—Slightly over 50 percent of the respondents held positive attitudes toward using a nonmechanical and a prescribed fire wilderness restoration method to restore the Mount Logan Wilderness. Respondents with positive attitudes toward these methods agreed that restoring the wilderness in a natural way is good. In comparing our results with other studies that focused on prescribed fire, we found similarities. Results from a regional sample of Montana and Wyoming residents showed that 55 percent of the residents supported prescribed fire, compared to 48 percent of a national sample (Manfredo and others 1990). Between our results and other studies, there appears to be support for using prescribed fire as a management tool to restore the Mount Logan Wilderness, as well as other wilderness areas.

## Options for Wilderness Ecological Restoration

Every wilderness restoration method is controversial. Mechanical treatments have potential wilderness impacts, nonmechanical treatments (the use of hand raking around all old-growth trees) may not be a viable option on a landscape scale, and the use of prescribed fire creates the potential for stand-replacing fires, especially in proposed or designated wildernesses, where fuels are rarely reduced prior to burning. Often prescribed fires become high intensity and uncontrollable wildfires, due to years of fuel accumulations. One example of this is the Yellowstone National Park prescribed natural fire ignitions of 1988, which burned under a fire prescription without a prior reduction in fuels and became uncontrollable. Firefighters frantically reduced fuels with mechanical methods by cutting trees in a matter of days instead of over a number of years (Wakimoto 1990). This illustrates the need in some wildernesses to reduce fuels prior to reintroducing fire, or prior to allowing naturally ignited fires to burn under certain fire prescriptions.

Some managers may be limited to only the use of prescribed fire as a wilderness restoration method, because of socio-political concerns with the use mechanical methods. Some people believe that the use of mechanical restoration methods is an unacceptable way to enhance the naturalness of these areas (Parsons and Landres 1998), but others believe that manual removal of fuels should precede the use of prescribed fire (Noss 1991).

Regardless of the restoration methods selected to reduce forest fuels, managers are aware that wildfires will continue to occur across legislative and administrative boundaries. The wilderness ignitions that led to the high intensity Cerros Grande and Clear Creek fires of 2000 are forcing managers to evaluate the range of wilderness restoration alternatives, especially where rural and urban communities interface with wildernesses.

## Conclusions

Unhealthy forest conditions result from altered wilderness conditions that are inhibiting natural processes. Years of grazing, logging, and fire exclusion have altered forest wilderness ecosystems. These altered landscapes are conducive to unnaturally intense and often stand-replacing fires. Managers need to decide if wildernesses should be left unmanipulated or be restored to more natural conditions (Cole 1996).

Restoration outside wildernesses usually entails the use of mechanical methods to reduce fuels, along with the use of prescribed fire to restore the natural fire regime. Using mechanical methods prior to the use of prescribed fire may not seem to be a popular option among the general public, but the social research presented above concluded that mechanical methods were the most acceptable and preferred wilderness restoration method. These results were taken into consideration by the Arizona Strip Field Office, BLM, but management decisions are not based upon the results of

this one study. The study did create the impetus for the BLM to begin a dialog about wilderness restoration among diverse regional public groups. Managers are encouraged to discuss wilderness restoration methods if they want to restore wilderness conditions to a more natural state and decrease the potential for wilderness fires to interface with rural and urban communities. Wilderness managers considering socio-political parameters are struggling to determine when wilderness restoration is appropriate and the range of restoration methods that can be employed.

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