

RESOURCE NOTES

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Mount Logan Wilderness: a Southwestern Ponderosa Pine Ecological Restoration Study

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Wilderness Restoration

Wilderness areas are important ecologically, philosophically, and socially. Because wilderness areas serve as core areas in the design of landscape-scale conservation reserves, it is essential that they be healthy and fully functioning

ecosystems. Often, however, the ecological integrity of these areas has been degraded by human actions to such an extent that they bear little resemblance to the untrammeled wild land areas envisioned in the Wilderness Act of 1964. For such wilderness areas to contribute fully to their ecological, philosophical, and social potential, these degraded wild lands must be restored.

When the Wilderness Act was passed, it was generally assumed that areas designated as wilderness would be more or less in a natural condition and that, if not, setting them aside would be sufficient to allow them to recover with only minimal management. However, in some instances, such as wilderness areas that include ponderosa pine,

changes since Euro-American settlement may be so great that failure to take an ecological restoration approach may place wilderness characteristics in grave jeopardy.

The Mount Logan Wilderness ecological study was completed in 1998, as a joint research project between the Arizona Strip, Bureau of Land Management, and Northern Arizona University.

The study concluded that overgrazing, logging (previous to wilderness designation), and fire exclusion associated with Euro-American settlement have dramatically altered forest conditions. These changes include increases in tree density, fuel loads, and crown fire risk, as well as decreases in herbaceous composition and old-growth trees and snags.

Wilderness Changes

The most pervasive source of degradation in ponderosa pine ecosystems is the disruption of the natural fire regime. The natural fire regime for the Mount Logan Wilderness was determined from thirty-two fire-scarred trees, which produced 200 fire-scar samples. Analysis of these samples indicates that frequent low intensity surface fires burned every 5 years until Euro-American settlement in 1870. Since 1870, fire exclusion has allowed fuel loadings and tree density to increase steadily, providing prime conditions for severe, high-intensity crown fires.

That the frequent fires have been absent from the Mount Logan Wilderness since 1870 is consistent with results from a more extensive data set from just outside of the wilderness boundary. This date,

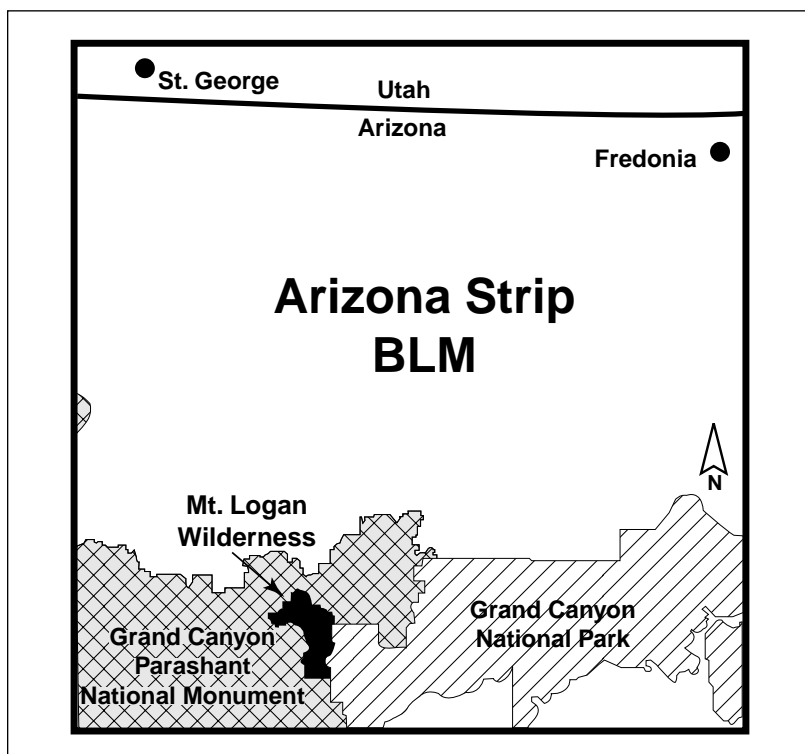


Figure 1. Mt. Logan Wilderness Vicinity Map.

along with historical accounts of settlement and a dendrochronological analysis of thirty-four 20x50 m ecosystem monitoring plots, provided solid evidence that the keystone process of frequent fire has been absent from the Mount Logan Wilderness for almost 130 years. In the words of the Wilderness Act, the Mount Logan Wilderness is no longer a wild land "...generally affected by the forces of nature."

Wilderness Management Implications

Wilderness threats have been predominantly assumed to be a consequence of recent or anticipated human intrusions into wild lands. It is less well known that cumulative impacts associated with Euro-American settlement have created conditions that support increasingly large and intense crown fires in some areas. Such fires are the principal threat to

southwestern ponderosa pine wilderness areas. Using the best science available, managers, scientists, and the public must decide how to reduce this threat. In this regard, ecological restoration approaches have the potential to reduce the threat of crown fires while meeting wilderness management objectives determined in the Wilderness Act of 1964.

Society at large must have a role in deciding the future management of our wilderness areas. Because of social and political conflicts, the types of wilderness treatments that are feasible must be addressed and acceptable alternatives selected. These wilderness ecosystems can no longer endure laissez-faire management without losing many of their wilderness characteristics.

The absence of the natural fire regime in addition to past practices

of overgrazing and logging have dramatically changed the Mount Logan Wilderness forest structure. These subsequent changes are contrary to the goal in the Wilderness Act, where man's imprint is to be substantially unnoticeable. From an ecological, philosophical, and social perspective, now is the time to change the trajectory of southwestern ponderosa pine wilderness areas, through ecological restoration, before these ecosystems can no longer properly function and wilderness integrity is lost. For further information on the efforts described above.

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