

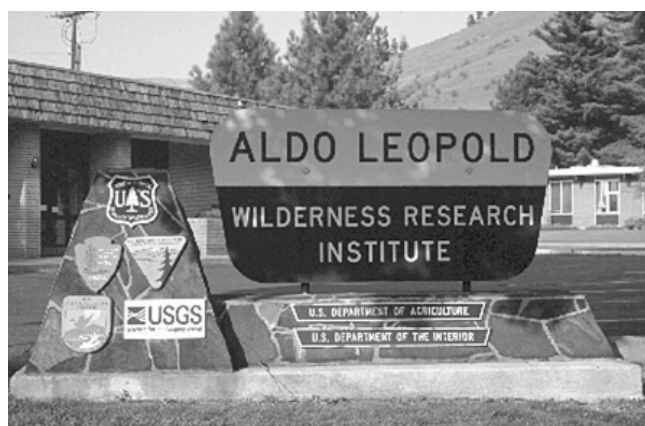
The U.S. Geological Survey and Wilderness Research

BY PAUL STEPHEN CORN

The land management agencies of the Department of the Interior (DOI), the National Park Service (NPS), U.S. Fish and Wildlife Service, and Bureau of Land Management are responsible for 51.5 million acres (20.8 million ha), or 71.5% of the nation's designated wilderness. In addition, the NPS generally manages backcountry lands not designated as wilderness for wilderness values. The U.S. Geological Survey (USGS) does not manage public lands, but is the DOI agency responsible for "providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life" (USGS, www.usgs.gov/aboutusgs, accessed February 15, 2008).

Despite DOI agencies managing the majority of wilderness lands, the USGS does not have a formal wilderness research program. There is one USGS research scientist stationed at the Aldo Leopold Wilderness Research Institute (ALWRI), and a keyword search on wilderness using the internal USGS project tracking database returned only four research projects. However, just as U.S. Forest Service (FS) scientists not affiliated with ALWRI conduct considerable wilderness research, scientists in several of the USGS disciplines conduct research important to wilderness.

The recent panel review of Forest Service wilderness research recommended that wilderness research address three broad, interconnected topics (Parsons 2007): (1) science for wilderness (to provide information necessary for management); (2) wilderness for landscape sustainability (to understand the role of wilderness in maintaining the ecological integrity of the surrounding landscape); and (3) wilderness for science (use of wilderness as an outdoor laboratory). Although it is not possible in this space to thoroughly review wilderness research in the USGS, a few examples illustrate studies that address the recommendations of the FS panel review.



Science for wilderness is the predominant theme of research conducted by Jeff Marion, a research biologist at the USGS Patuxent Wildlife Research Center, stationed at Virginia Tech University in Blacksburg. Marion's work in recreation ecology has addressed visitor impacts (campsites and trails) in protected areas, particularly national parks, and it closely parallels a core area of FS research at ALWRI. Scientists at the USGS Colorado Water Science Center in Denver, including Don Campbell, David Clow, Alisa Mast, George Ingersoll, Leora Nanus, and others, monitor alpine and subalpine watersheds for water quality, with a particular recent emphasis on atmospheric deposition of acids, nutrients, mercury, and organic contaminants. Their study areas include backcountry areas of national parks and several FS wilderness areas. A goal of understanding the hydrological processes and pathways in these systems clearly relates to wilderness in a landscape context. The USGS Amphibian Research and Monitoring Initiative (ARMI) has made extensive use of NPS wilderness and backcountry in western parks as locations for studies of amphibian population

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decline. ARMI scientists whose studies include significant backcountry work include Mike Adams (Forest and Rangelands Ecosystem Science Center, Corvallis, Oregon) Gary Fellers (Western Ecological Research Center, Point Reyes National Seashore, California), Erin Muths (Fort Collins Science Center, Colorado), and myself. Projects have included extensive monitoring of population status, attempted reintroduction of extirpated species, effects of potential stressors such as wildfire and ultraviolet radiation, and detection of pesticides in amphibian tissues in remote watersheds.

The areas of emphasis recommended by the FS panel review are not really discrete categories, and many studies will address more than one topic. The studies by the Colorado Water Science Center demonstrate this by monitoring wilderness condition (topic 1) and using wilderness as an unmanaged standard (topic 3), in addition to studying hydrology (topic 2). The Western Mountain Initiative (WMI) is a collection of independent research projects that also encompass more than one of the recommended research topics. The WMI addresses the role of climate change in mountain ecosystems in the western United States, with emphasis on disturbance

(fire), vegetation, hydrology, and identifying sensitive resources and potential management responses. USGS scientists involved in the WMI include Craig Allen (Fort Collins Science Center, Bandelier National Monument, New Mexico), Jill Baron (Fort Collins Science Center, Natural Resource Ecology Laboratory, Colorado State University), Dan Fagre (Northern Rocky Mountain Science Center, Glacier National Park, Montana), and Nate Stephenson (Western Ecological Research Center, Sequoia-King's Canyon National Park, California).

The distinction between wilderness managed by the FS and by DOI agencies is also fuzzy. USGS scientists work in FS wilderness, much as FS scientists at ALWRI and elsewhere have projects that include DOI wilderness. Furthermore, research conducted in undeveloped areas of DOI protected areas is typically applicable to the management of lands designated as wilderness. The lack of clear distinctions in wilderness research indicates that the recommendations of the FS panel review are also applicable to the USGS. For example, the USGS is devoting increasing resources to global change research; therefore, the recommendation in the review to increase the integration between wilderness and

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global change research is especially important. This is the approach begun by the WMI and likely to be emulated by more projects as funding for global change studies increases.

The FS panel review dealt only with FS research and did not address USGS projects. However, a logical extension of the recommendations would be a better integration of all federal research relating to wilderness, and a needed step is to conduct a complete review of the wilderness-related research currently being carried out by the USGS. **IJW**

References

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