

## SCIENCE FEATURE

# Scientific study and enduring wilderness

By Kevin Hood

*We must not only protect the wilderness from commercial exploitation. We must also see that we do not ourselves destroy its wilderness character in our own management programs. We must remember always that the essential quality of the wilderness is its wildness.*

—Howard Zahniser (1953), principal author and champion of the 1964 Wilderness Act, U.S. Public Law 88-577

**HOWARD ZAHNISER CAUTIONED THAT WE MUST NOT ONLY** protect wilderness but also guard against our own manipulative tendencies in administering these wild areas. Even scientific studies that advance our understanding of nature can compromise the integrity of wilderness (fig. 1). For example:

- A nationwide vegetation survey sought to grid the landscape with monument clusters consisting of stakes, nails, metal flashing, and rods and to access remote plots by helicopter (USDA Forest Service 2006).
- Wildlife researchers corralled molting Canada geese in net pens using aircraft, boats, and kayaks, anesthetized the birds, obtained blood and feather samples, and surgically implanted radio transmitters inside the abdomens of some (Hupp et al. 2010).
- A state agency tranquilized brown bears, extracted tooth and hair samples, and installed temporary radio collars and permanent ear tags (USDA Forest Service 2011).

These studies would expand knowledge of flora, fauna, and natural systems. They would be conducted by professionals with strong connections to their subject matter. Yet each was to occur in wilderness, where monumentation, installations, helicopters, and manipulation of wildlife are normally prohibited by the Wilderness Act.

Wilderness managers and scientists need to find a common approach whereby scientific activities adhere to Wilderness Act standards (fig. 2, next page) (Six et al. 2000; Bayless 1999; Eichelberger and Sattler 1994). Commendable efforts have been made toward this goal, notably, A Framework to Evaluate Proposals for Scientific Activities in Wilderness (Landres et al. 2010) and Wilderness Research in Alaska's National Parks (National Park Service n.d.). This article examines three fundamental aspects of

## Abstract

This article examines three fundamental aspects of the Wilderness Act critical to wilderness managers and scientists seeking a common understanding as to how scientific study should occur in wilderness.

## Key words

administration, management, monuments, science, untrammeled, wilderness, wildlife



JUNEAU RANGER DISTRICT WILDERNESS PROGRAM (2)



**Figure 1.** Managers and scientists need to work together to ensure that scientific activities in wilderness do not compromise the essence of wildness, for example, (top) by trammeling wildlife or (bottom) by modifying remote lands with installations.



**Figure 2.** Wildlife research methods that uphold the untrammeled quality of wilderness character include observing from afar how

the Wilderness Act whereby increased understanding may help wilderness managers and scientists improve collaboration.

## 1. The purpose of the Wilderness Act and the mandate to preserve wilderness character

The purpose of the Wilderness Act is to give present and future Americans the benefits of an enduring wilderness resource. The act distinguishes wilderness by powerfully expressing what it is and by explicitly noting what it is not. The law affirms qualities of wilderness using potent descriptors: untrammeled, undeveloped, natural, unimpaired, primeval, outstanding opportunities for solitude or a primitive and unconfined type of recreation. It lists wilderness purposes as recreational, scenic, scientific, educational, conservation, and historical use.

The Wilderness Act contrasts wilderness with other lands, asserting that wilderness areas are not occupied and modified by increasing population, expanding settlement, and growing mechanization; are not dominated by humans and their works; do not have permanent improvements or human habitation; and do not have a noticeable imprint of humans' work. The law checks uses that would degrade the natural environment. With narrow exceptions, it prohibits commercial enterprise, roads, motorized and mechanized use, as well as installations and structures.

Most pertinently, the act states that the paramount purpose of wilderness is to preserve wilderness character. Howard Zahniser selected “untrammeled” as the single word best embodying wilderness and he successfully fought to retain this unconventional term in the act's definition of wilderness (Scott 2002; Harvey 2005). It means uncontrolled, unimpeded, and unmanipulated and is a synonym for “unfettered.” An interagency team charged with developing a strategy for upholding wilderness character

harbor seals react to vessel traffic (above, left), and using passive hair snares along game trails to obtain brown bear DNA samples (above).

selected “untrammeled” as one of the fundamental aspects, along with “undeveloped,” “natural,” and “outstanding opportunities for solitude or a primitive and unconfined type of recreation” (Landres et al. 2008). These qualities comprise wilderness character. By understanding that preserving wilderness character is the purpose of wilderness, and what this means, both scientists and managers will have a common basis for discussing what types of scientific activities are appropriate, or not, in wilderness (see “Using wilderness character to improve wilderness stewardship” by P. Landres, W. M. Vagias, and S. Stutzman, this issue, pages 44–48).

## 2. The role of scientific study in wilderness

The Wilderness Act recognizes scientific study as a valid wilderness purpose. But the law also asserts that the overarching purpose to which all other purposes are subordinate is preserving wilderness character. By affirming wilderness qualities and restraining degradative uses, the Wilderness Act sets high standards that ensure that scientific activities, as well as all other activities, do not compromise wilderness character.

Scientific studies should be designed to sustain the undeveloped and natural aspects of wilderness areas. They should not trammel wildlife, impinge upon outstanding opportunities for solitude, employ motorized equipment or mechanical transport, or place installations or structures. In wilderness, considerations of economy, expediency, and protocol yield to the primary purpose of upholding wilderness character, not to hinder research but to support and protect what wilderness remains.

While the need to exercise restraint may challenge conventional protocol, it can be done. Wildlife research can be carried out in a manner that upholds the untrammeled aspect of wilderness (Schwartz et al. 2011). Examples include snaring hair, collecting

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feathers, sampling scat, and distantly observing populations or behavior (see fig. 2). Note that while the Wilderness Act provides limited exceptions for the use of installations and motorized equipment, the act makes no exception for trammeling wildlife.

Regarding the undeveloped quality, monumentation is a prohibited installation that degrades this aspect, even when it is deemed necessary and permitted. Strategies to avoid monumentation should be part of the planning process. Digital photos, global positioning system (GPS) waypoints, and detailed site maps will suffice in most cases. Similarly, helicopters are prohibited, degrade the undeveloped quality, and should be discouraged while traditional means of conveyance are encouraged.

The standards of the Wilderness Act apply unless they are expressly modified by another congressional law or, as discussed below, the act's own standard for certain exceptions are met. While these occasionally allow a scientific study to use methods that would typically be prohibited, the mandate to preserve wilderness character remains. That is, even if prohibited uses are authorized, the study still must strive to minimize impacts to wilderness character.

### **3. The restrictive allowance for exceptions**

To emphasize the need for restraint, the Wilderness Act lists certain activities that are prohibited, including commercial enterprise, permanent and temporary roads, motor vehicles, motorized equipment, motorboats, aircraft landing, mechanical transport, and structures or installations. The act does, however, allow certain of these prohibited uses when they are “necessary to meet minimum requirements for the administration of the area for the purpose of this Act.” The following questions help clarify if it might be legitimate to allow prohibited uses such as helicopters or monuments:

1. Is the study essential to preserve wilderness character?
2. Are the prohibited uses the minimum means necessary to conduct the study?
3. Will the research findings be integrated into the administration of the area?

The first question pertains to the necessity of the study and whether it upholds the purpose of the Wilderness Act. The second question concerns whether the proposed prohibited uses are genuinely the minimum that are necessary. The third question ensures that any exception granted is done so to improve the administration of the area as wilderness rather than allowing research for its own sake.

Only if all three questions are answered affirmatively and with compelling reasoning should a more comprehensive minimum requirements analysis be completed, such as provided at [www.wilderness.net/MRDG/](http://www.wilderness.net/MRDG/), to fully assess the legitimacy of employing the requested prohibited uses. Otherwise the proposed scientific study should be denied the prohibited uses.

This standard for exemptions solely concerns the prohibited uses in question; it is not a standard for approving the scientific study. Furthermore, scientists are not being singled out to adhere to the high standards required by the Wilderness Act: these standards apply equally to scientists, managers, and others.

## **Conclusion**

There is no debate over whether or not research is a legitimate value and use of wilderness. The Wilderness Act specifically states that scientific purpose is a part of wilderness. But the law is also abundantly clear that the overarching purpose, the purpose to which all other purposes must yield, is that of preserving wilderness character. While temperance in support of this goal may challenge scientific orthodoxy, “there is nothing inherently incompatible between science and wilderness” (Landres et al. 2010).

Communication and education can help achieve the desired common approach. Scientists need to learn of the purpose of wilderness and high standards of the Wilderness Act. Managers need to understand what scientists seek to learn and what techniques they conventionally employ. Then, under this spirit of mutual understanding and collaboration, the two groups can work together to find progressive ways to conduct research that preserves or even replenishes wilderness character. For instance, scientists can remove monuments previously established as they convert to GPS and digital photography to record plots. They can report trash, monitor solitude, and carry out other tasks that help wilderness managers. Managers can provide knowledge of campsites and

access routes, offer logistical support, and possibly train their personnel to help with research.

Most importantly, conducting science appropriately in wilderness allows for the greater purpose of the Wilderness Act to be realized: the preservation of wilderness that affords us, as Howard Zahniser (1957) attests, profound knowledge vital to our well-being:

We deeply need the humility to know ourselves as the dependent members of a great community of life, and this can indeed be one of the spiritual benefits of a wilderness experience. Without the gadgets, the inventions, the contrivances whereby men have seemed to establish among themselves an independence of nature, without these distractions, to know the wilderness is to know profound humility, to recognize one's littleness, to sense dependence and interdependence, indebtedness, and responsibility. Perhaps, indeed, this is the distinctive ministration of wilderness to modern man, the characteristic effect of an area which we most deeply need to provide for in our preservation programs.

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