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In This Issue

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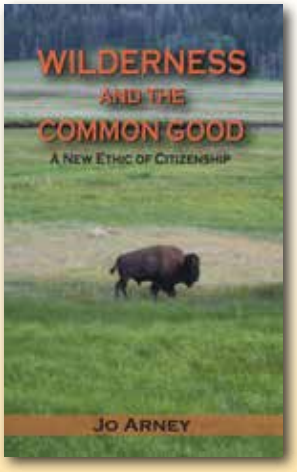

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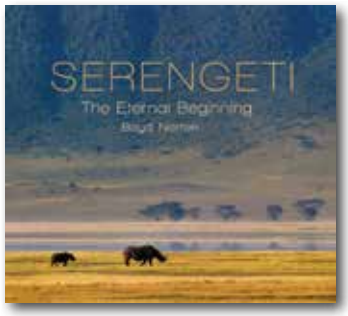

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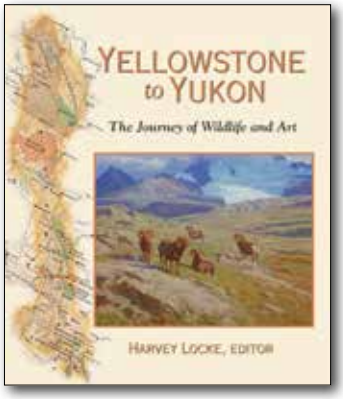

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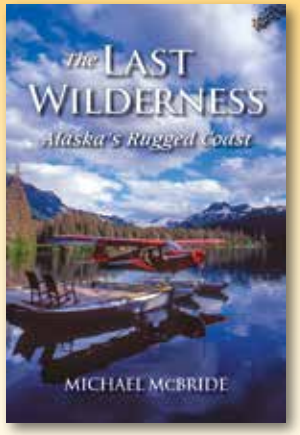

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Disclaimer

The *Soul of the Wilderness* column and all invited and featured articles in *IJW*, are a forum for controversial, inspiring, or especially informative articles to renew thinking and dialogue among our readers. The views expressed in these articles are those of the authors. *IJW* neither endorses nor rejects them, but invites comments from our readers.

—John C. Hendee,
IJW Editor-in-Chief Emeritus

On the Cover

Main image:
Long-eared owl (*Asio otus*) in Boulder, Colorado, USA. Photo © Melanie Hill.

Inset image:
Great Sand Dunes National Park and Preserve, south-central Colorado. Photo © Jaime Rojo.

International Journal of Wilderness

The *International Journal of Wilderness* links wilderness professionals, scientists, educators, environmentalists, and interested citizens worldwide with a forum for reporting and discussing wilderness ideas and events; inspirational ideas; planning, management, and allocation strategies; education; and research and policy aspects of wilderness stewardship.

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EDITORIAL PERSPECTIVES

Forward Wilderness

BY CHAD DAWSON and ROBERT DVORAK

Following the celebration of the first 50 years of the National Wilderness Preservation System (NWPS), we have put away the reusable champagne glasses and biodegradable confetti to once again continue work for wilderness. Deciding what to do and what not to do is challenging. Like a functional and healthy family, we will have our disagreements, and our strength is tolerance of our differences and mutual support of wild places and nature.

We can sit for days and debate how well the dream was realized, its shortcomings, and its strengths; opportunities foregone and threats to wilderness conditions and character; its probable future success and/or demise; and dozens of other related topics – all worthy of thought, consideration, discussion, debate, and then action. There is no shortage of opinions and passionate arguments. We are confident that we, as a wilderness community, will find that way forward for the next 50 years – sometimes incrementally and sometimes in bold steps – but always with all the enthusiasm, passion, diverse opinion, debate, conflict, and conviction that have marked its history to date.

We need to continue to find a way forward for the future of the NWPS and to continue to realize and receive the values and benefits of wilderness.

In this issue of *IJW*, there are six articles offering different perspectives about defining wilderness character and monitoring the conditions of wilderness. What they do agree on is that we need to continue to find a way forward for the future of the NWPS and to continue to realize and receive the values and benefits of wilderness. Stewart Brandborg reminds us of the passion of the early wilderness movement in his article on wildness and its importance in defining wilderness character, Dvorak summarizes the forthcoming interagency report on wilderness character monitoring, Martinez outlines the perspective of the Wilderness Policy Council on wilderness character monitoring, Nagle offers a legal opinion on the agency implementation of wilderness character monitoring, Collins describes monitoring efforts on wildlife refuges in Oregon, and Griffin expresses concern for wilderness character monitoring that does not include a historic baseline.

Cordell and colleagues compare the similarities and differences in wilderness values between managers and the public. Ghimire and coauthors report on how the American public perceives the benefits of wilderness and expresses its support for wilderness. Finally, Hawes and colleagues assess the value of wilderness in a World Heritage Area in Tasmania.

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SOUL OF THE WILDERNESS

Wilderness, Wildness, and Wilderness Character

BY STEWART BRANDBORG

In any reflection on my love for wilderness, it is the realization that whenever I find myself in wilderness, the prevailing influence that I sense so deeply is the wildness of the place. Whether in the alpine of my beloved Rocky Mountains, the Arizona deserts, coastal marshes, or beachscapes, I am deeply affected by the single fact that this place is, as it is, evolved through natural processes – in total wildness.

Beyond the absence of human influence, it is only the natural processes or nature's evolution that brings me what I am there to savor: the product of natural forces so immense in their dimension that I am humbled in trying to comprehend.

This quality of wildness, of autonomous and unfettered nature, was the central concern of those of us who, in the 1950s and early 1960s, wrote and worked for enactment of the Wilderness Act. My boss and mentor at the Wilderness Society, Howard Zahniser, chose *untrammeled* as the key word in the Act's definition of wilderness because it means free from man's intent to alter, control, or manipulate nature and its processes. Olaus Murie called it "nature's freedom." Sig Olson, George Marshall, Harvey Broom, and Ernest Oberholtzer – all of us agreed with Zahniser that *untrammeled* was the best word to convey this most important quality of wilderness character. So those of us who had a hand in drafting the Wilderness

Figure 1 – Wilderness Society Governing Council meeting on September 2–5, 1962, held at the Elbo Ranch in Grand Teton National Park, Wyoming. Back row, left to right: Olaus Murie, Howard Zahniser, Robert Cooney; middle row: Jim Marshall, George Marshall, Ernest Griffith; front row: Sigurd F. Olson, Dick Leonard, Harvey Broome, Stewart M. Brandborg. Photo courtesy of the Brandborg family.

Act or pushing it through Congress considered wildness to be the cornerstone of wilderness character, the preservation of which is the central mandate of the Act. As Zahniser said to the New York legislature in 1953, three years before he wrote the first draft of the Wilderness Bill, "We must remember always that the essential quality of the wilderness is its wildness."

So it makes me mad as hell to see that some in the agencies charged with implementing the Act have reduced wildness to just one of four or five qualities of wilderness. It has diminished the central importance of wildness in wilderness character to instead only a fraction of wilderness character. It has opened the door to manipulation of natural processes that strikes at the heart of wilderness character.

It is the wild that permeates the human experience in wilderness.

Now toward the end of my life's work for wilderness, I ask its defenders to never forget: Wildness is foremost the quality of wilderness that we must seek to preserve. It is the forces of nature at full play in the absence of human intent, not to be categorized or classified in any structured form; animal and plant communities evolving with geological forces as they always have, perpetuating the wild in these enclaves we have set apart as wilderness.

Figure 2 – Brandborg giving a speech about wilderness at a podium ca. 1988. Photo courtesy of the Brandborg family.

Throughout our nation we have a diversity of wildland areas where we can still find the evolutionary processes of nature at full play, molding the environment as each fulfills its role: weather; climate change; evolutional, natural selection of plants and animals; the cataclysmic impacts of fire; and other natural forces.

Wilderness is recognized because of its wild qualities and naturalness free from human influences. In its wildness it is not to be categorized or submitted to human patterns of definition. Untrammeled nature at its fullest in the absence of human manipulation is its present and its future. We can only strive for its preservation in the absence of human contrived definition.

It is the wild that permeates the human experience in wilderness. We, as visitors, become aware that this wild place has survived through natural evolution and in its wildness it determines its own future – not subject to the subjective classifications of humankind, but in and of itself beyond classification.

Let us never forget that this is the essence of wilderness character.

STEWART BRANDBORG conducted pioneering wilderness field research on mountain goats in Idaho and Montana in the 1940s and 1950s before moving his family to the Washington, D.C., area to take a job with the National Wildlife Federation. He joined the Governing Council of the Wilderness Society in 1956 and began working with Howard Zahniser to craft and pass the Wilderness Act. In 1960, Zahniser hired Brandborg on the Wilderness Society staff to help push the Wilderness Act over the finish line. After Zahniser's early death in 1964, Brandborg directed the Wilderness Society for the next dozen years, building a nationwide grassroots wilderness movement and bringing new areas into the National Wilderness Preservation System. He continues his wilderness advocacy today, including serving as senior advisor for Wilderness Watch.

Keeping It Wild 2

Reviewing the Interagency Wilderness Character Monitoring Strategy

BY ROBERT DVORAK

Editor's Note: This article is a summary and synthesis of the interagency "Keeping It Wild" strategy (available online at http://www.treesearch.fs.fed.us/pubs/49721). Large sections of the strategy are presented verbatim to help the reader understand the context and updates to the strategy. Thus, this summary should not be considered the unique work of the author.

Introduction

The 1964 Wilderness Act's Statement of Policy, Section 2(a) states that wilderness areas "shall be administered ... so as to provide for the protection of these areas, the preservation of their wilderness character" (Public Law 88-577). This section of the act puts emphasis on a concept that can be at times abstract and contentious, but critical to the essence of wilderness. This is the notion of wilderness character. As legal mandate in the Wilderness Act and the subsequent policies of the four federal wilderness managing agencies (the Department of the Interior's Bureau of Land Management, Fish and Wildlife Service, and National Park Service; the Department of Agriculture's Forest Service), wilderness character applies to all wildernesses across the National Wilderness Preservation System (NWPS). These legal and policy mandates raise several questions: What is our understanding of wilderness character? How do we examine wilderness character within the NWPS? How do we know if we are preserving wilderness character?

The 2008 publication of *Keeping It Wild: An Interagency Strategy for Monitoring Wilderness Character across the National Wilderness Preservation System* (Landres et al. 2008) provided a nationally consistent interagency strategy to assess whether wilderness character is being preserved. Landres et al. (2008) explain that the primary purpose of this monitoring strategy was to improve wilderness stewardship by providing wilderness managers a tool with which to assess how attributes of wilderness character are changing over time. These changes in attributes are related to stewardship activities and their outcomes. Thus, a monitoring strategy should provide information that addresses the following:

Robert Dvorak.

- How do stewardship activities affect attributes of wilderness character?
- How are attributes selected to be integral to wilderness character changing over time within a wilderness, within an agency, and across the NWPS?

Building an Interagency Strategy

The Keeping It Wild interagency monitoring strategy incorporates a wide variety of information and data from different resource areas to understand and examine wilderness character for a wilderness unit. Landres et al. (2015) suggest that wilderness character monitoring provides the agencies:

- information to improve on-the-ground wilderness stewardship and wilderness policy reviews that is based on credible data that are consistently collected and endure over time as personnel change;
- accountability for the legal and policy mandate "to preserve wilderness character" that links key stewardship activities directly to the 1964 Wilderness Act; and
- a communication framework to comprehensively discuss wilderness stewardship needs and priorities within and among the four wilderness managing agencies and with the public.

Landres et al. (2008; 2015) utilize the statutory language of the 1964 Wilderness Act to identify five qualities of wilderness character that form the foundation of the Keeping It Wild monitoring strategy: (1) Untrammeled, (2) Natural, (3) Undeveloped, (4) Solitude or Primitive and Unconfined Recreation, and (5) Other Features of Value. Landres et al. (2008) describe each of these qualities with consistent monitoring questions and indicators. However, they suggest that each quality should be assessed with specific measures identified by the agency or local wilderness managers responsible for the given wilderness area. In this manner, the strategy can provide guidelines for selecting locally relevant measures and describe how to assess trends in the measures, indicators, monitoring questions, qualities, and in wilderness character. In the updated strategy, Landres et al. (2015) also address misuses, misconceptions, and known concerns about wilderness character monitoring.

Landres et al. (2008; 2015) strived to create a pragmatic and effective way to assess trends in wilderness character. However, to keep the scope of the framework practical, the Keeping It Wild strategy

- monitors tangible attributes of the five qualities of wilderness character derived from Section 2(c) in the 1964 Wilderness Act, and does not monitor the intangible, symbolic, societal, or personal values, meanings, and benefits of wilderness character;
- assesses trend in wilderness character over time for an entire wilderness, and does not assess how wilderness character is changing in specific locations within a wilderness, or how wilderness character compares across different wildernesses; and
- does not fulfill all of the monitoring requirements that are needed to manage an individual wilderness.

Keeping It Wild 2

Each agency independently implemented the 2008 Keeping It Wild monitoring strategy, and agency-specific adjustments were made to improve the relevance and applicability of these concepts. In March 2014, the Aldo Leopold Wilderness Research Institute organized an Interagency Wilderness Character Monitoring Lessons Learned Workshop. The purpose of this workshop was to build on what had been learned since *Keeping It Wild* was published in 2008 and make necessary corrections to ensure future interagency consistency in wilderness character monitoring. Landres et al. (2015) utilized the findings from this workshop and several recent publications (BLM 2012; NPS 2014a; NPS 2014b) as the basis for *Keeping It Wild 2*, which updates and replaces the original 2008 publication.

The Keeping It Wild 2 strategy is structured around the following process (as described in Landres et al. 2015):

- To ensure national consistency, all agencies use the strategy's organizational framework of qualities, monitoring questions, and indicators for each wilderness. One or more measures are selected for each indicator that are either chosen by the local office managing the wilderness or required by the managing agency.
- Data are collected, gathered, or compiled for each measure, using existing resources wherever possible.
- Once there are at least two data points per measure, a trend (upward, stable, or downward) is determined based on agency-required or locally established rules. Trends in each measure are reported at five-year intervals.
- Trends in each measure within an indicator are compiled using consistent rules to determine the trend in the indicator. Only the trends in the measures, not the data, are compiled. These same rules are then used to determine the trend in each monitoring question, each quality, and ultimately the overall trend in wilderness character.
- Once the trend in wilderness character for each wilderness is determined, the percentage of wildernesses with an upward or stable trend in wilderness character within a region, an agency, and across the NWPS can be derived.

Major Changes for *Keeping It Wild 2*

Following the Interagency Wilderness Character Monitoring Lessons

Learned Workshop in March 2014, recommendations to change or clarify the 2008 version of *Keeping It Wild* were developed.

General recommendations included that wilderness managed by more than one agency should use one set of measures for wilderness character monitoring. It was also suggested that wilderness character monitoring is appropriate for areas that are not legally designated as wilderness as long as agency policy requires that the area be managed to preserve its wilderness character. The 2008 *Keeping It Wild* stated that wilderness character monitoring applied only to designated wildernesses, but wilderness character monitoring can also track on-the-ground changes and inform stewardship in areas with future potential for wilderness designation.

Recommendations were also made for when trends in a measure, monitoring question, indicator, quality, and overall trend in wilderness character are reported. Landres et al. (2015) recommended that these trends should be described as "downward" or "upward" instead of "degrading" or "improving," respectively. Additionally, a detailed description of possible measures is no longer included in *Keeping It Wild 2*. Such detail in the 2008 version was necessary to help users understand how this interagency strategy could be implemented. However, *Keeping It Wild 2* places emphasis on interagency consistency across the qualities and indicators, not the measures. Landres et al. suggest that each agency needs to determine their own process for selecting measures, including whether to use agency-required measures or measures determined by the local wilderness unit. While *Keeping It Wild 2* does not include detailed descriptions of measures, Landres et al. do provide general guidance for identifying appropriate measures for the Untrammeled and Natural qualities in the appendices.

Key recommendations are also made to the five wilderness qualities; Following is a summary of those recommendations (Landres et al., 2015):

Untrammeled Quality

- The definition of this quality needs to include the idea of "intentionality" to focus more tightly on the purpose behind a decision. The 2008 *Keeping It Wild* did not include "intentionality" in the definition of the Untrammeled Quality, but including it greatly improved understanding about this quality.
- Subsistence or sport hunting that is allowed in wilderness areas is not considered an intentional manipulation that degrades the Untrammeled Quality unless that hunting is authorized or managed to intentionally alter natural wildlife abundance or distribution, or predator-prey relationships.

Natural Quality

- The three 2008 indicators ("Plant and animal species and communities," "Physical resources," and "Biophysical processes") are replaced with four indicators ("Plants," "Animals," "Air and water," and "Ecological processes") to provide greater clarity and linkage with existing agency resource areas.
- Discussion about the possible use of measures of indigenous species and species that are listed as threatened, endangered, sensitive, or of concern has been deleted. Such measures created significant problems in providing interpretable trends in the data because human-caused change is confounded with natural variability.
- A measure that relies on data from outside the wilderness (e.g., intentional predator control actions) may be used to infer effects inside the wilderness if such a measure is the best or only one available, and a direct link between the action outside the wilderness and its likely effect in the wilderness can be verified

Undeveloped Quality

- Defunct installations, structures, and developments may be included in a measure of physical developments.
- Large debris/trash (e.g., motor vehicles, airplanes, military debris, mining debris, trash dumps) may be included in a measure of physical developments.
- The monitoring question and indicator focused on cultural resources constructed by indigenous peoples prior to modern settlement, such as cliff dwellings, pit houses, and kivas, were moved to the new "Other Features of Value" Quality.

Solitude or Primitive and Unconfined Recreation Quality

- Medium-sized trash (e.g., hunting and outfitting camp trash, marine trash on a beach) may be considered in a measure under the indicator "remoteness from sights and sounds of people inside wilderness." In contrast, micro-trash (e.g., twist ties, wrappers) should not be considered in a measure under this indicator.

Landres et al. (2015) suggest that implementing this monitoring strategy does not guarantee the preservation of wilderness character but rather informs and improves wilderness stewardship and ensures managers are accountable to the mandate of the Wilderness Act—preserving wilderness character.

Other Features of Value Quality

- This quality was not included by Landres et al. in the 2008 *Keeping It Wild* publication but has already been used or proposed for use by all four agencies. This quality focuses on the condition of tangible, site-specific features that contribute to scientific, educational, scenic, and historical values in wildernesses, as well as contribute to subsistence value. This quality accounts for cultural resources that are integral to wilderness character.
- This quality addresses one monitoring question, "What are the trends in the unique features that are both tangible and integral to wilderness character?" This question has two indicators: "Deterioration or loss of integral cultural features" and "Deterioration or loss of other tangible and integral features of value."

Moving Forward

Wilderness character is a complex concept with intangible, societal, and personal aspects. Landres et al. (2015) suggest that this monitoring strategy is not a decision-making framework that can be used to determine what projects or actions should or should not occur within a wilderness. Rather, they argue that this monitoring shows how wilderness character is changing over time as a result of such projects and actions. The qualities described by Landres et al. in this monitoring strategy may also be useful as a means for organizing and describing potential effects from proposed projects and actions.

Landres et al. (2015) describe the primary audiences for the information from this monitoring framework as agency staff who manage wilderness day-to-day, and regional and national staff who develop wilderness policy and assess its effectiveness. They suggest that the results of this monitoring provide these staff key data they need to improve wilderness stewardship and wilderness policy. The revised Keeping It Wild 2 strategy is designed to be nationally consistent across the four wilderness managing agencies, remain locally relevant, be cost-effective, and facilitate communication across stakeholders that are responsible for preserving wilderness character. Landres et al. (2015) suggest that implementing this monitoring strategy does not guarantee the preservation of wilderness character but rather informs and improves wilderness stewardship and ensures managers are accountable to the mandate of the Wilderness Act—preserving wilderness character.

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The Legal Meaning of Wilderness Character

BY JOHN COPELAND NAGLE

The Wilderness Act commands that wilderness areas be managed for "the preservation of their wilderness character" (16 U.S.C. § 1131(a)). The act does not say, however, what the character of wilderness is. Nor have the courts answered that question in the 51 years since the act became law.

The meaning of the term *wilderness character* is at the heart of a dispute about the proper approach to wilderness management. From one perspective, wilderness management is an oxymoron. To manage wilderness, in that view, is to defeat the very wildness that defines it. But from another perspective, wilderness management is essential to preserve the qualities that comprise the wilderness. An unmanaged wilderness, it is claimed, could cease to be a wilderness at all. This dispute is assuming new urgency as the climates of many wilderness areas are changing, and as the federal agencies responsible for managing wilderness areas struggle to respond to those changes.

The legal dispute concerning the meaning of wilderness character is well illustrated by the conflicting positions articulated by a recent federal interagency document (Landres et al. 2015), and some of its detractors who advocate for a different definition of wilderness character (Brandborg 2015). According to the agencies, wilderness character is a holistic idea that encompasses a range of tangible and intangible features of what makes a place a wilderness, and it can be defined and measured by monitoring five wilderness conditions. Some wilderness advocates insist that the character of wilderness is quite straightforward: The essence of wilderness character is its wildness, which is more comprehensive and appropriate to the legislative history than the sum of the five wilderness conditions that the federal interagency document framework has chosen to monitor.

Statutory Interpretation

The terms of this argument involve statutory interpretation. There is a rich judicial and scholarly history of how to interpret statutes that has seen an especially robust discussion during the past several decades. Generally, the plain meaning of the statutory language determines the meaning of a statute. There are some exceptions to that rule that apply when the plain meaning produces an absurd result or one demonstrably at odds with the legislative drafters of the statute. The scope of those exceptions is key to the Supreme Court's pending decision regarding the availability of subsidies under the Affordable Care Act, but there is no suggestion that the meaning of wilderness character in the Wilderness Act triggers one of those exceptions.

John Copeland Nagle.

The determination of what constitutes the plain meaning of a statute begins with an examination of the statutory text. That includes both the contested provision (here, wilderness character) as well as the rest of the statute. Plain meaning can be discerned as a matter of common sense, or it may be illuminated by dictionaries that defined the word at the time the statute was enacted. Typically, though, whether a statute has a plain meaning must be determined without recourse to the legislative history of the statute's enactment.

Many statutes, and many statutory provisions, lack a plain meaning. To interpret an ambiguous statute, one will look at legislative intent and purpose, legislative history, and other contextual factors that help illumine what the provision means. There are also a host of linguistic and

substantive canons that help inform the interpretation of a statute.

These rules apply to courts, agencies, attorneys, and anyone else who has occasion to determine what a statute means. But there is a special rule for the judicial review of federal agency interpretations. If an agency interprets a statute that it has the authority to implement, then the courts will defer to the agency's reasonable interpretation of an ambiguous statute. That interpretive canon, announced in a 1980 case involving the application of the Clean Air Act to Chevron's oil refineries, states a two-part test. First, the court must ask "whether Congress has directly spoken to the precise question at issue." If so, then such clear congressional intent must be followed by the agency as well as the court. If not, then a court proceeds to ask the second question: whether the agency's interpretation of a statute that is silent or ambiguous with respect to the specific issue "is based on a permissible construction of the statute." If so, then the court must defer to such a reasonable interpretation. If not, then the court will overturn the agency's interpretation, but the agency can then proffer another reasonable definition – the court doesn't just fill in the right answer itself (Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc. 1984).

This approach to statutory interpretation shows that there are two distinct questions that must be answered when interpreting the term *wilderness character* in the Wilderness Act. The first question is simply to ask what the term means. But the second question may prove more important. It asks whether the agencies have offered a reasonable interpretation of an ambiguous term. If so, then the courts will defer to the agency interpretation, even if that interpretation is not the "best" one.

These questions frame the evaluation of the contrasting interpretations of wilderness character offered by the federal agencies and the wilderness advocates. Let me begin with the federal agencies. Landres et al. (2015) offer several explanations of the meaning of "wilderness character." It is "a holistic concept based on the interaction of (1) biophysical environments primarily free from modern human manipulation and impact; (2) personal experiences in natural environments relatively free from the encumbrances and signs of modern society; and (3) symbolic meanings of humility, restraint, and interdependence that inspire human connection with nature" (p. 5).

The agencies identify five qualities that collectively describe the meaning of wilderness character: untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and the catchall "other features of value" (Landres et al. 2015, pp. 5–10). These qualities "are equally important," they "apply to every wilderness," and they "are uniquely expressed within each wilderness" (Landres et al. 2015, pp. 10–11). But "wilderness character is more than these qualities" because "there are also important intangible aspects of wilderness character that would be difficult or impossible to quantify" (Landres et al. 2015, p. 11). In that respect, "wilderness character is like a violin or any musical instrument composed of separate pieces that interact to form something greater than the sum of its parts" (Landres et al. 2015, p. 10).

The agencies insist that wilderness management decisions "may preserve or degrade these qualities" (Landres et al. 2015, p. 11). That means that an agency's action may improve one aspect of wilderness character while diminishing another. The agencies offer this example: "a bridge built to protect a stream bank from erosion caused by people or horses crossing the stream is also an installation that diminishes the opportunity for people to experience the primitive challenge of crossing the stream" (Landres et al. 2015, p. 11). Wilderness managers must acknowledge how such tradeoffs impact wilderness character. By considering the five qualities of wilderness character, managers can "approach wilderness stewardship with humility, respect, and restraint, ultimately helping them to preserve wilderness management as a whole" (Landres et al. 2015, p. 12).

The courts have been receptive to the affirmative efforts of management agencies to restore the wilderness character of a wilderness area. For example, one court allowed the use of helicopters to facilitate the recovery of wolves in an Idaho wilderness area because "it was man who wiped out the wolf from the area [and] now man is attempting to restore the wilderness character of the area by returning the wolf" (Wolf Recovery Foundation v. U.S. Forest Serv. 2010). Another court agrees that reestablishing the native Paiute cutthroat trout in a California wilderness area "enhances the primitive character of an ecosystem and serves a conservation purpose ... permissible under the Act" (Californians for Alternatives to Toxics v. United States Fish and Wildlife Serv. 2011). The courts have also acknowledged that the factors identified in the act can inform the meaning of wilderness character. See *Montana Wilderness Ass'n v. McAllister* (2011) about interpreting the term *wilderness character*

in the Montana Wilderness Study Act of 1977 to include the "outstanding opportunities for solitude" referred to in the Wilderness Act.

Now we turn to some wilderness advocates who counter that wilderness character has a single, plain meaning. That meaning, they claim, appears in the Wilderness Act's statement that "a wilderness, in contrast with those areas where men and his works dominate the landscape, if hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" (16 U.S.C. § 1131(a)).

The textual analysis of the Wilderness Act cannot end there, as some wilderness advocates recognize, for the statute continues after the preceding definition to state that

> an area of wilderness is further defined to mean an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (16 U.S.C. § 1131(a))

Thus, some wilderness advocates contend that the Wilderness Act contains two distinct definitions of wilderness. The first, ideal definition, they say, governs the meaning of wilderness character, not the second, practical definition. They rightly cite the rule of statutory interpretation that all the words in a statute are to be given meaning lest a provision be wrongly dismissed as surplusage. An alternative interpretation would combine the two definitions – ideal and practical – to produce a meaning of wilderness, and thus wilderness character, that is both aspirational and pragmatic, and which aspires toward unhindered natural processes while accepting that human management may be necessary to provide the "opportunities" and "values" served by wilderness areas.

Some wilderness advocates rely on the legislative history of the Wilderness Act, formal and informal, to demonstrate that its drafters intended the meaning which they describe. Their reliance on all such legislative history is somewhat surprising given their assertions that the interpretive question is settled by the plain meaning of the statutory text and their acknowledgment that legislative history is irrelevant if the statutory text is clear. Moreover, some wilderness advocates rely almost exclusively on the statements of the earlier wilderness advocates who championed the enactment of the Wilderness Act.

Some wilderness advocates rightly emphasize the crucial role that Howard Zahniser played in lobbying Congress to enact the law, but they omit any mention of Wayne Aspinall, who has a competing claim to the paternity of the Wilderness Act. As I have explained elsewhere,

> "Aspinall served as the chair of the House Interior and Insular Affairs Committee during that time, and he insisted on balancing wilderness values with other claimants to the use of federal public lands. The compromises extracted by Aspinall that were necessary to finally secure passage of the law included the relaxation of some of the law's land use restrictions, shifting the authority to designate wilderness areas from federal land agencies to Congress, and the elimination of the proposed National Wilderness Preservation Council. (Nagle 2014)."

Most importantly, the Wilderness Act contains seven express exceptions from the law's otherwise applicable prohibitions on such things as motorized vehicles, aircraft, and structures. The most frequently employed exception allows temporary roads, motor vehicles, motorized equipment, motorboats, aircraft landings, mechanical transport, structures, and installations when they are "necessary to meet minimum requirements for the administration of the area for the purpose of this Act" (16 U.S.C. § 1133(c)). That exception, and others like it, is nonsensical from the perspective of the understanding of wilderness character promoted by the wilderness advocates. If all that is needed is to keep wilderness areas wild and free from human interference, then there will never be an instance when it is "necessary" to allow roads, vehicles, and the like to administer a wilderness area in a manner that achieves the act's purposes. The fact that the act presumes that such activities are necessary implies that wilderness management should consider all of the act's goals, both ideal and practical.

Reasonable Agency Interpretation

It is not necessary, though, to decide which of the competing meanings of

wilderness character is the right one. The courts only ask whether a statute is susceptible of different interpretations, and if it is, then the courts will defer to a reasonable agency interpretation. That is the approach that the Ninth Circuit, the federal appeals court with jurisdiction over the western states that contain most of the federal wilderness areas, has taken in cases involving the Wilderness Act and its term *wilderness character*. In *High Sierra Hikers Association v. Blackwell* (2004), a group of wilderness supporters challenged the Forest Service's issuance of permits to commercial packstock operators in the John Muir and Ansel Adams Wilderness Areas. The federal appeals court had to decide how much deference to afford "the Forest Service's determination that preserving the wilderness character [of a wilderness area] is not the ultimate interest of the Wilderness Act" (High Sierra Hikers Association v. Blackwell, 2004). The court indicated that it believed that "Congress make the long-term preservation of wilderness areas the ultimate goal of the act" (High Sierra Hikers Association v. Blackwell, 2004). But that did not answer the deference question posed to the court. Instead, the court concluded that "the diverse, and sometimes conflicting list of responsibilities imposed on administering agencies renders Congress's intent arguably ambiguous," so the court ruled that the agency's understanding of the act was entitled to deference. The court then addressed the extent of that deference. Because the Forest Service "was granting permits, not acting in a way that would have precedential value for the parties," the agency's decision received only "'respect' based on the persuasiveness of the decision.'" Id. at 648 (quoting Wilderness Soc'y, 353 F.3d , 1067). By contrast, when the agency acts "with the force of law" – for example, by issuing regulations interpreting the Wilderness Act – the agency's interpretation received the judicial deference offered by Chevron (High Sierra Hikers Association v. Blackwell, 2004, pp. 647–648).

Subsequently, the same court emphasized the discretion that the act afforded to management agencies in a case involving the Fish and Wildlife Service's (FWS) placement of water structures for thirsty bighorn sheep in an Arizona wilderness area. The court explained that "the Act gives conflicting directives to the Service in administering the area" so that the agency must exercise "judgment and discretion" (Wilderness Watch, Inc. v. U.S. Fish and Wildlife Serv., 2010). Earlier, a three-judge panel divided regarding the meaning of the "natural conditions" and "wilderness character" in the Wilderness Act. Two judges argued that the law explicitly anticipates human modifications, while the dissenting judge objected to "artificial" management actions; but an en banc, 11-judge panel reheard the case and decided it without having to resolve that issue (Wilderness Soc'y v. United States Fish and Wildlife Serv., 2003).

Some wilderness advocates would argue that this is not a question of law but rather of our ethical commitment to restrain ourselves in administering these lands. There is an important sense in which that is true. Wilderness has a crucial ethical, even spiritual, dimension, that should inform all of our efforts to identify which lands to designate and how to manage them (Nagle 2005). But the question concerning the meaning of wilderness character is a legal one that requires legal tools to answer it. Those tools suggest that there are strong arguments for the understandings offered by both the federal agencies and the wilderness advocates, but the judicial deference to an agency's interpretation of a statute suggests that the courts will uphold the understanding of wilderness character that the agencies propose.

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Perspectives on Wilderness Character Monitoring

The Wilderness Policy Council

BY CYNTHIA MARTINEZ

Fifteen years ago, the interagency Wilderness Policy Council (WPC) began discussing the need for an interagency strategy to monitor trends in wilderness character. In the 1964 Wilderness Act, Congress directed the wilderness managing agencies to preserve the wilderness character of every wilderness within the National Wilderness Preservation System (NWPS). The policies and guidance of all four federal wilderness-managing agencies address the need to prevent the degradation of wilderness character, but, up to the mid-2000s, none of the agencies had established a process to evaluate whether they really were successful in preserving wilderness character. Challenges at the time centered around whether the four agencies could agree on how and what to measure, who would do it, how the data would be used, and above all, how the agencies could afford to do it.

In 2004, the Council directed the interagency Wilderness Steering Committee (WSC) to charter a team that would develop an interagency approach to wilderness character monitoring. The Committee in turn established an interagency Wilderness Character Monitoring Team (WCMT), chaired by a representative from the Aldo Leopold Wilderness Research Institute and composed of representatives from the four agencies and the U.S. Geological Survey. This team was tasked with developing a nationally consistent interagency strategy to monitor wilderness character across the NWPS, building on the 2005 wilderness character monitoring strategy published by the Forest Service.

In 2008, this team published the peer-reviewed and pilot-tested *Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System*. In 2009, the WPC formally endorsed *Keeping It Wild* and recommended that the agencies complete wilderness character baseline inventories by the 50th anniversary of the Wilderness Act in 2014.

Cynthia Martinez

While the journey has been slow, the agencies are making progress. Two recent developments will help ensure much more rapid progress during the next five years:

1. *2020 Vision: Interagency Stewardship Priorities for America's National Wilderness Preservation System*, signed by the agency heads in October 2014 at the 50th Wilderness Conference, includes completing wilderness character inventories across the NWPS as a top priority.
2. An interagency team recently completed *Keeping It Wild 2*, the updated version of *Keeping It Wild*, which improves interagency consistency by incorporating lessons learned from the past several years of conducting wilderness character baseline inventories.

There are several ways this monitoring can help us better preserve wilderness character, and already we can see how preparing wilderness character baseline inventories is influencing wilderness managers:

- The process of assessing the current status of wilderness character has actively engaged on-the-ground

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Wilderness Character Monitoring

Wildlife Refuges in Oregon and Nevada

BY AARON COLLINS

After a two-hour drive and an hour-long hike we were homing in on the location. I held up the photo and Max agreed – we were close. "I think that big rock in the foreground is that one right there." Max pointed to a large lichen-covered basalt boulder attached precariously to the edge of the 1,000-foot (305 m) escarpment. After some adjustments and cautious positioning, Max got the angle just right and we completed our second photo point of the day, which gave us a great comparison with a 1971 photo from the same location. We took that photo to show the size and density of western juniper in the landscape and to complement the more quantitative measure Max and other refuge staff had developed as part of our wilderness monitoring effort.

This was Max's first day venturing into the Poker Jim Ridge Proposed Wilderness Area (Figure 1) as a wilderness fellow working to conduct wilderness character monitoring for 359,000 acres (145,282 ha) across nine proposed wilderness areas on the Hart Mountain National Antelope Refuge in south-central Oregon and in the nearby Sheldon National Wildlife Refuge in northwest Nevada.

The nine areas were recommended for wilderness designation through proposals submitted by the president to Congress in 1969 and 1974. Today these areas remain as proposed wilderness areas awaiting action by Congress and are managed in the interim by the U.S. Fish and Wildlife Service (USFWS) as wilderness. Both prior to and since these areas were proposed for wilderness designation, the USFWS has managed them to fulfill their wilderness purposes; for the conservation and restoration of fish, wildlife, and plants; and as a range and breeding ground for pronghorn and other wildlife. These efforts have included both reintroduction and removal of plants, fish, wildlife, and other animals; construction and removal of permanent structures, including livestock developments; control of both wild and prescribed fires; and surveys, scientific studies, and research. However, despite the variety and number of conservation and restoration efforts, little has been done to document changes to wilderness character during the 45 years since these areas were originally proposed for designation.

Aaron Collins. Photo by Gail H. Collins.

USFWS Wilderness Character Monitoring

In 2014, Max was one of several wilderness fellows working throughout the country developing a comprehensive look at the character of every wilderness area throughout the National Wildlife Refuge System. The process had begun three years earlier as part of the USFWS's wilderness character implementation team commitment made by each land management agency to develop and implement a long-term strategy for measuring and monitoring wilderness character throughout the entire National Wilderness Preservation System within the United States.

Overall, the wilderness character monitoring process was fairly straightforward and relatively easy. The USFWS's monitoring strategy relied on previously collected data, final reports for other National Wildlife Refuge System wilderness areas as examples, and a wilderness fellow who was highly motivated, had already been trained,

and hit the ground running. The primary task for refuge staff was to select monitoring measures for each of the wilderness quality indicators that had been established for the National Wildlife Refuge System. The refuge staff as a group discussed and identified a list of possible measures that were then refined based on the type and quality of existing information available. Once a final list of measures was identified, data were compiled and then a final written report was produced.

Monitoring wilderness character within the refuges, and Sheldon Refuge in particular, presented some unique challenges. Because eight proposed wilderness areas comprise the majority (60%) of Sheldon Refuge, there are few administrative distinctions between wilderness areas or between wilderness and nonwilderness lands. Some management activities occur throughout the Sheldon Refuge and have essentially the same or similar effect on the wilderness character of all eight areas. Since there are few distinctions between these areas, the management activities, resources, and impacts were not often recorded or tracked by wilderness area, but rather they were simply recorded for the Sheldon Refuge as a whole. This presented challenges for determining whether monitoring data accurately measured wilderness character for each wilderness, particularly for measures of natural condition.

For example, feral horses and burros have long impacted the natural quality of the nine proposed wilderness areas. While accurate annual population estimates are available, there are few barriers to animal movements other than the barbed-wire fence that encompasses the entire Sheldon Refuge. Because it was not possible to estimate the number of animals within each proposed wilderness area, the total number of animals within the refuge was the measure used. Measures were selected, when possible, using data available to represent each wilderness area separately, such as measures of air quality and species diversity. To alleviate spatial problems associated with monitoring measures, we relied heavily on measures based on discrete location data, such as the number of prescribed fires, the acres of a particular plant species, or the number of permanent water developments.

Figure 1 – Wilderness fellow Max Mutter takes in the view during a day of wilderness character monitoring in the proposed Poker Jim Ridge Wilderness Area, Hart Mountain National Antelope Range. Photo by Aaron Collins.

As the refuge staff progressed through the wilderness character monitoring process, we realized that our lack of past monitoring had failed to capture significant changes in wilderness character – most of which were improvements. Substantial improvement to the undeveloped character of wilderness areas within both refuges had already been made through removal of abandoned livestock developments and barbed-wire fencing. We can articulate these improvements in other ways, but wilderness character monitoring would have been a meaningful way to quantify these improvements over time. Similarly, past management had made significant improvements to the natural character of all nine wilderness areas through the removal of feral animals. However, because the measure used for populations of feral animals is a five-year average, much of the improvement will be reflected in future monitoring efforts.

By contrast, we found other measures may not accurately capture future change. For example, recreation use throughout the refuges is considered very low and there is little data and attention paid to measures of solitude and primitive or unconfined types of recreation. The nine proposed wilderness areas provide ample opportunities for solitude, and while there is little likelihood recreational visitation will increase

substantially, the lack of robust measures could present challenges for accurately monitoring long-term recreational trends.

This type of monitoring is key to adaptive resource management and wilderness stewardship.

We encountered a few surprises as well. In particular, the monitoring effort highlighted how certain refuge projects or programs have a number of interconnected actions that are simultaneously influencing wilderness character in both positive and negative ways. For example, national concern for greater sage-grouse has resulted in increased management efforts aimed at protecting and restoring important habitat. Our habitat restoration efforts have improved natural conditions, but at the same time they have manipulated the environment, and involved the presence of work crews and the use of motorized equipment, all of which have degraded wilderness character. Future monitoring should help both illustrate and quantify trade-offs between short-term degradation and long-term improvements from such management actions. The written discussion included in the final report for each monitoring measure was necessary to explain how certain measures were interrelated and would be important for evaluating trade-offs, expected changes, and trends based on future monitoring efforts.

Refuge staff members are aware generally of what types of aerial flights occur over Sheldon Refuge; however, the total number of flight days from all uses combined was surprisingly higher than expected. While overflights are not prohibited, these flights do impact wilderness character, and it is hoped that these impacts will be considered when deciding the appropriate and minimum tool necessary for administration of these nine proposed wilderness areas and the Sheldon Refuge.

The monitoring of wilderness character for all nine proposed areas was completed using data already being collected by staff or other agencies, and this bodes well for ensuring continued monitoring in the future. Several measures were selected not only because they serve to monitor wilderness character but also because they were already being used to measure progress in meeting other refuge management goals and objectives as well as trends for key refuge resources. The collection of these data to meet other needs and their relevance to management of nonwilderness resources increases their priority and ensures continued collection and tracking in the future.

Monitoring and Management

The measures selected were specific to the Sheldon Refuge and the nine proposed wilderness areas and will lead to trend analysis over time. Given the relationship between wilderness character monitoring and management decisions, we will be able to gauge the accuracy of our decision-making process as well as the outcomes for those decisions on wilderness character. This type of monitoring is key to adaptive resource management and wilderness stewardship.

Several measures rely on data that are less than perfect. As more accurate data become available, measures will need to be adjusted to ensure trends reflect actual changes on the ground rather than improved data accuracy. Some measures may prove to poorly reflect trends in wilderness character and may therefore need to be replaced. As with any monitoring strategy, modifications and changes will need to be made over time, but having a complete baseline inventory against which future changes within each proposed wilderness can be measured are important steps toward better wilderness stewardship.

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Shifting Baseline Syndrome and Wilderness Character

BY C. B. GRIFFIN

Enshrined into Section 4(b) of the Wilderness Act is the requirement that each wilderness management agency "shall be responsible for preserving the wilderness character of the area." All four agencies have adopted policies that require them to preserve wilderness character (Landres et al. 2015). There are several questions that Section 4(b) raises.

The first question, "What is wilderness character?" is answered in great detail in *Keeping It Wild 1* (*KIW 1*) (Landres et al. 2008) and the updated version, *Keeping It Wild 2* (*KIW 2*) (Landres et al. 2015). Although wilderness character has both qualitative and quantitative components, the focus of wilderness character monitoring in the Keeping It Wild strategies is on numerical measures with an accompanying narrative. This reductionist method makes it easier to quantify wilderness character, track changes over time, and to aggregate results across agencies and the National Wilderness Preservation System (NWPS).

The second question 4(b) raises is, "Is there a universal minimum standard for wilderness character?" Dawson and Hendee (2009) answer the question by saying there isn't a minimum national standard. Each wilderness is unique, and managers must ensure that wilderness character doesn't degrade below the condition when it was established. Long a part of air and water pollution laws, the principle of nondegradation has been applied to wilderness character to ensure that it doesn't decline over time (Pinchot Institute for Conservation 2001; Scott 2014).

The third question has to do with the word *preserving* in Section 4(b), which also relates to the nondegradation principle. Restoration ecologists have to determine the point in history to which to restore an area. Agencies must establish a similar point in history – the baseline by which to judge whether wilderness character is being preserved (Pinchot Institute for Conservation 2001). The focus of this article is the question, "What is the point in history that federal land managers should use to establish the baseline for wilderness character in an individual wilderness area?"

C.B. Griffin

The Reference Point for Preserving Wilderness Character

In simplest terms, a baseline – the "reference point against which change over time is measured and evaluated" (Landres et al. 2008) – is either when a wilderness area was designated or some other point in time. Several authors (Dawson and Hendee 2009; Worf 2001) using the concept of nondegradation, set a wilderness's baseline as the time of designation (Dawson and Hendee include the possibility of using an earlier date – the date it is identified as a wilderness study area).

For 10 years, interagency documents have set a wilderness's baseline as the date of designation (Landres et

al. 2005), but gradually that has changed.[1] Before *KIW 1*, Landres et al. (2005, p. 14) defined the **ideal** baseline as "the time of wilderness designation" and the **practical** baseline as "the first time this [wilderness character] monitoring is conducted." Some of this language persisted into *KIW 1*, which declared that agency policies are to "prevent the degradation of wilderness character from its condition or state **at the time the area was designated as wilderness**" (Landres et al. 2008, p. 4). However, *KIW 1* also lists two possible dates for determining baseline wilderness character: "the **Time of Wilderness Designation** or the **First Time This Monitoring Is Conducted**." *KIW 1* goes on to say, "Ideally, this baseline is documented at the time a wilderness is designated. For wildernesses that have already been designated, appropriate historical data, if available, **should** be used to describe the baseline condition retrospectively. **However**, few existing wildernesses actually have this information. **Therefore**, baseline condition would most likely be documented from the first time this monitoring is implemented, even though such a description would not give an accurate picture of how the wilderness has changed since the time of designation" (p. 11).

In a 2008 presentation, Preserving Wilderness Character, Landres utilized a widely used graphic that clearly shows that the baseline for wilderness character is the time of designation (Figure 1). In describing the figure he says, "The Wilderness Act and all agency policies clearly state that whatever the status of wilderness character is at the time of designation, the agencies are to not let this status degrade, or slide down on this graph" (Landres 2008).

One year later, in the 2009 *Technical Guide* for wilderness character monitoring (Landres et al. 2009), some of the language had softened with respect to the baseline question. "Appropriate historical data, if available, **may** be used to describe the baseline condition retrospectively. **Because** few existing wildernesses actually have this information, baseline condition would most likely be described from the first time this monitoring protocol is applied, even though such a description will not give an accurate picture of how the wilderness has changed since the time of designation" (p. 13).

baseline for establishing a designated area's wilderness character. Later in the document that distinction disappears: "The first year that data for **all measures** have been collected using this interagency strategy forms the baseline."

The 2008 *KIW 1* document indicates the onus is on the agency to go back in time to create the baseline. By the 2009 *Technical Guide*, the *should* declaration of 2008 had softened to *may* go back in time. In 2009, the *however* agencies don't generally have the historic data changed to *because* agencies don't have the data, the date of the baseline won't be the date of designation, rather it will be the date wilderness character monitoring is

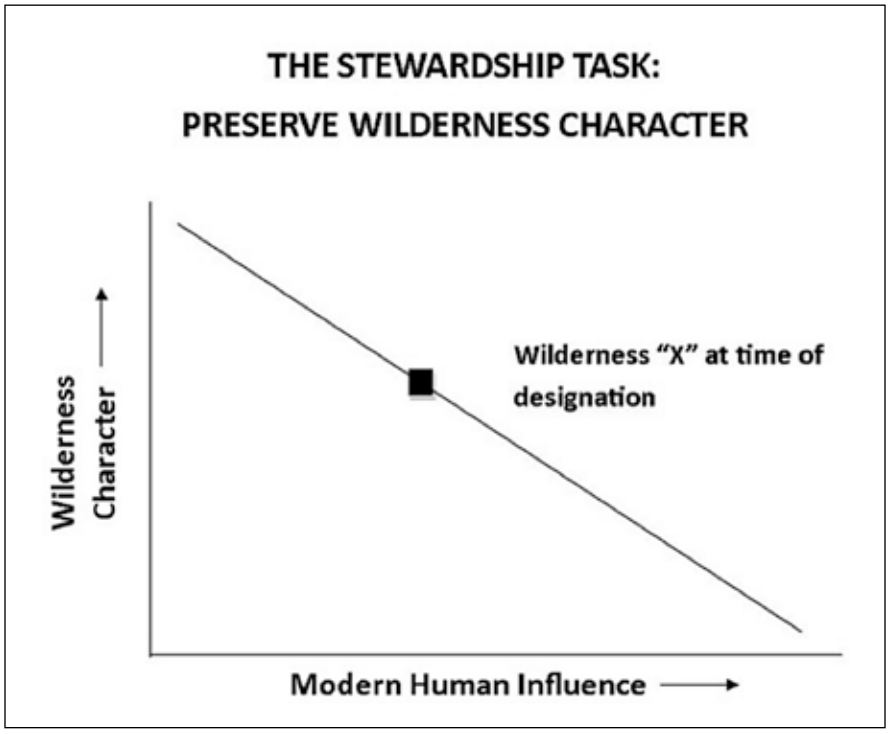

Figure 1 – Preserving Wilderness Character at the Time of Designation. (Source: Landres 2008).

KIW 2 keeps the two possible dates for baseline (designation or when wilderness character monitoring was first completed using all measures), and it continues the differentiation between ideal (date of designation) and the practical first applied. Both *KIW 1* and the 2009 *Technical Guide* end with the same pronouncement: Using today as a wilderness area's baseline will not provide an accurate portrayal of the wilderness's real baseline – the one that existed at the time of designation.

[1]Boldface in this section indicates emphasis added.

A dramatic change appears in *KIW 2*. Instead of acknowledging that using today's wilderness character monitoring as the baseline isn't an accurate way to describe the real baseline, this section has been expunged: "Even though such a description would not give an accurate picture of how the wilderness has changed since the time of designation". Elsewhere, *KIW 2* still acknowledges, "From a legal standpoint wilderness character needs to be preserved from the time of wilderness designation" (Landres et al. 2015, p. 56). *KIW 2* is therefore an example of the shifting baseline syndrome.

Shifting Baseline Syndrome

Pauly (1995) notes that the baseline for fish stocks keeps changing because each fisheries manager thinks the baseline is the species composition and quantity of fish that existed when they started. "The result obviously is a gradual shift of the baseline, a gradual accommodation of the creeping disappearance of resource species, and inappropriate reference points for evaluating economic losses resulting from overfishing, or for identifying targets for rehabilitation measures" (p. 1).

KIW 2 is aware of the possibility of a shifting baseline; it uses it as a rationale to support the need to document wilderness character using their protocol. "Experience and knowledge of a wilderness are often lost with staff turnover, and the baseline understanding of resource conditions shifts over time." While documenting wilderness character today is necessary to ensure the baseline won't shift in the future, it completely ignores the fact that we are starting with an already shifted baseline if we're using today's date as the baseline.

Nickas (2000) describes the implications of a proposed new Forest Service (FS) policy, which can be applied to this discussion. In Nickas's figure 1, wilderness x has degraded below the standards for wilderness (the hatched area); therefore, the wilderness qualities must be improved. In contrast, the *KIW 2* strategy essentially says the "wilderness x" baseline is today – it amounts to a lowering of the hatched area to meet what currently exists in Nickas's figure 2. In a contradictory sentence, *KIW 2* contains the following line: "Determining the trend in wilderness character is necessary but not sufficient because this trend could be upward but the condition is still degraded compared with the time of designation." Yet there is no effort in *KIW 2* to establish an area's true baseline.

The approach articulated in *KIW 2* will lead to establishing a baseline that isn't an accurate portrayal of the legal requirement to maintain wilderness character from the date of designation. In essence, current wilderness character monitoring is beginning with a shifted baseline. For wilderness designated in 1964, that means 50 years' worth of change will be ignored. Few will argue that wilderness character has improved across the NWPS.

Agencies' Mixed Messages about the Date of Baseline

Some agencies have developed documents implementing *KIW 1*

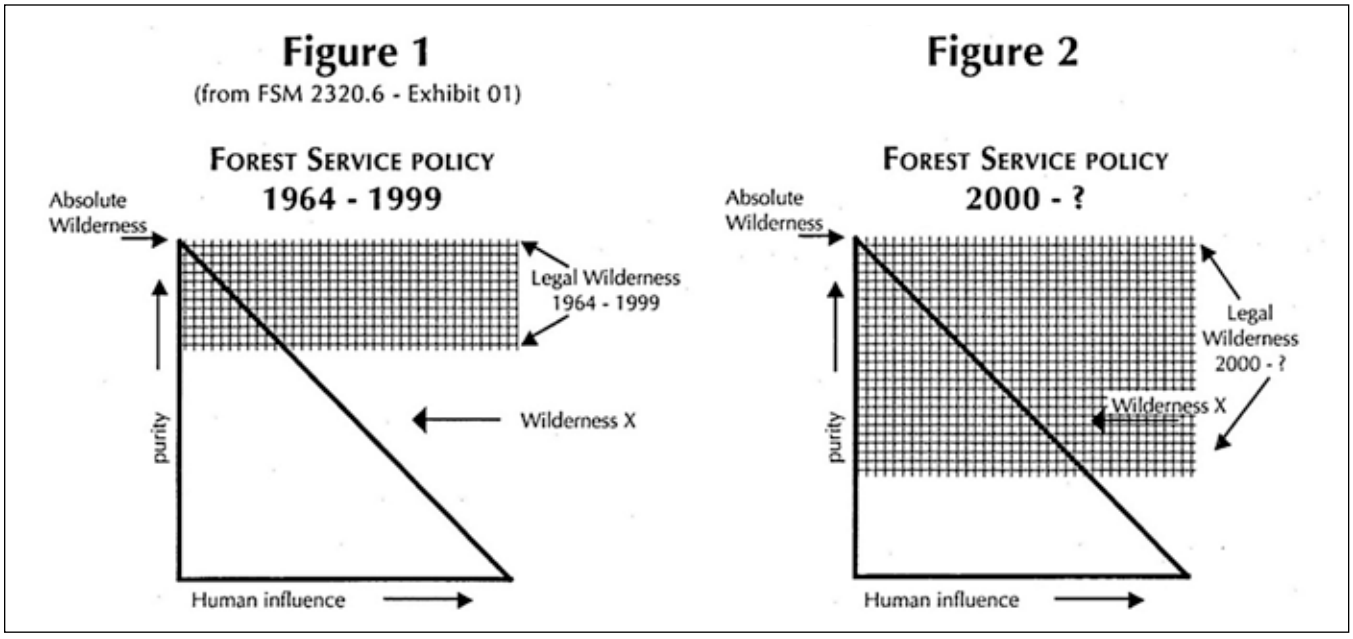

Figure 2 – Example of a Shifted Baseline. (Source: Nickas 2000).

Agencies must do the hard work of establishing wilderness character baselines as they existed at the time of designation. The public should settle for nothing less.

for their wildernesses. Two national parks took different approaches when it came to the baseline question. Death Valley National Park (NPS 2012) used the year it was designated as wilderness (1994), whereas Olympic National Park went back five years from the present (Tricker et al. 2013). The NPS 2014 *User Guide* cited different approaches across the agency. Buffalo National River used the current year for developing a wilderness character map but used older data in some cases. Denali National Park and Preserve went back five years for the untrammeled quality and went back "as far as possible" for the other wilderness character qualities. "Denali also decided to create a 'retrospective' wilderness character map using professional judgment back to the time of wilderness designation to use in estimating change to wilderness character since it was designated wilderness" (NPS 2014, p. 214).

Regardless of when the baseline is actually set, it would seem like the baseline is that point in time – forever more. Not so for the Bureau of Land Management (BLM). In the 2012 BLM Implementation Guide it was noted that "trend would be determined by comparing the old value with the new value #1, and a new baseline would be established by the new value #2. (In essence, a new baseline might be produced every five years.)" The BLM document contains policy direction that codifies the shifting baseline into their wilderness character monitoring. *KIW 2*, to its credit, doesn't follow the BLM direction. Whenever the baseline is established, it is the baseline by which all future monitoring is compared "to prevent slow, incremental degradation of wilderness character (Landres et al. 2015).

Establishing the True Baseline: The Role of Professional Judgment

Although obtaining data from when a wilderness area entered the NWPS from decades ago is difficult, it is incumbent upon federal agencies to establish the true baseline of wilderness character from the area's date of designation. It will be difficult to obtain quantitative information about wilderness character from the date of designation. However, managers can use professional judgment to qualitatively describe wilderness character. Landres et al. (2008, 2009) declare that wilderness character data can be produced by using professional judgment. The 2009 *Technical Guide* goes so far as to say professional judgment could be a source of data, especially if it is "deemed crucial for assessing trends in wilderness character." Furthermore, "these data will be used in the same way as any other data used in assessing trends in the indicator" (Landres et al. 2009). The use of professional judgment to establish wilderness character has carried over to *KIW 2*, which recommends that if there is no or poor-quality data, "local professional judgment may be used to assign a data value." If scouring files doesn't yield quantitative data, professional judgment can be used to establish wilderness character at the time of designation.

It is unfathomable that managers know nothing about the state of wilderness character from when the area was congressionally designated. Most agencies conducted studies prior to recommending areas to Congress. Professional judgment is widely used throughout agencies, and courts routinely defer to agencies' professional judgment (Eccleston and Doub 2012).

Conclusion

Keeping It Wild 1 and *2* are monumental efforts aimed at helping agencies meet their legal obligation to preserve wilderness character. Both interagency documents are valuable because they are one of the best ways we have to ensure we are managing a system of wilderness according to one universal system – the NWPS – instead of managing them piecemeal.

It is easy to find research to show that biophysical and social impacts in wilderness have increased since designation – Cole provided some earlier research in 1993 (Cole 2003). Unless there have been efforts to reverse these negative impacts, wilderness character has inevitably declined in these wildernesses since their designation.

Agencies must meet their legal requirement to preserve or increase wilderness character as it existed at designation. Since *KIW 2* allows professional judgment to be used to help establish wilderness character today, it can and should also be used to

develop the true baseline if historical quantitative data is lacking.

Describing wilderness character as it exists today is necessary but not sufficient to determine the wilderness character of an area. Using today as the baseline for wilderness character monitoring means we've already succumbed to a shifting baseline of what the true wilderness character is. Agencies must do the hard work of establishing wilderness character baselines as they existed at the time of designation. The public should settle for nothing less.

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Different Perspectives

Comparing Wilderness Values between Managers and the Public

BY H. KEN CORDELL, RAMESH GHIMIRE, and CHAD P. DAWSON

Introduction

How the public and managers value wilderness areas has been an important inquiry as it is a measure of support for the National Wilderness Preservation System (NWPS) (Cordell et al. 2005). Recently published results of surveys of the public and wilderness managers are compared based on a survey of a sample of the U.S. population and from a national study of wilderness managers. Reference to wilderness in both surveys is specifically to the NWPS. While these surveys were conducted in different years (2008 and 2014, respectively), both are relatively current and the list and phrasing of the 13 wilderness values used in each survey were the same.

Wilderness values data from the survey of the general population was generated through the National Survey on Recreation and the Environment (NSRE) (Cordell et al. 2008). The NSRE was an ongoing series of surveys that began in 1960 as the National Recreation Survey and then eventually became the NSRE, which was last administered in 2012. The NSRE was set up as a general population, random-digit-dialed household telephone survey designed to measure environmental attitudes of Americans. Public participants in the survey represent a random, cross-sectional sample of noninstitutionalized residents of the United States, 16 years of age and older. One of the questions asked survey participants in 2008 to rate the importance of 13 identified wilderness values on a five-point scale, from not at all important to extremely important.

The results pertaining to wilderness values held by federal managers of the NWPS were obtained through administration of the National Wilderness Managers Survey (WMS) (Ghimire et al. 2015a). Between February 24 and May 19, 2014, responses were received from 368 federal managers of the NWPS in the Forest Service (FS), Bureau of Land Management (BLM), National Park Service (NPS), and Fish and Wildlife Service (FWS). Requests to all agency field and regional units responsible for area management within the NWPS were sent by a national representative of each of the four federal land management agencies asking that all their personnel charged with wilderness management duties respond to the survey. Both the WMS instrument and its administration were managed online through SurveyMonkey (www.surveymonkey.com). Completed surveys were forwarded by respondents through SurveyMonkey to team members at the University of Georgia in Athens, Georgia, for analysis. Data were analyzed and reported by the USDA Forest Service and University of Georgia team members in Athens to both the Aldo Leopold Wilderness Research Institute and the Arthur Carhart Wilderness Training Center in Missoula, Montana. One of the questions asked managers in 2014 to rate the importance of 13 identified wilderness values on a five-point scale, from not at all important to extremely important (Ghimire et al. 2015b).

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Measuring Wilderness Values

Perspectives of the public versus manager respondents were somewhat different. Public survey participants were responding with how important each value is to them

personally; for example, valuable in order that they personally have the option to visit wilderness areas. Manager participants were responding with how important each value is in management of the NWPS; for example, valuable in order that the public has the option to visit wilderness areas. Because the question frameworks were otherwise identical, a comparison is possible between how the population of the United States and how federal wilderness managers rated the importance of each of the 13 values.

In both the NSRE and WMS surveys, the respondents (wilderness managers and the public) were provided a five-point scale from not at all important (= 0), slightly important (= 1), moderately important (= 2), very important (= 3), to extremely important (= 4) as the response to rate the importance of preserving wilderness areas for each of these statements. In Table 1 the column headings labeled "very or extremely important" summarize the percentage of respondents (managers or the public) that rated the wilderness values statements very or extremely important. The column labeled "mean score" is the average score for that value based on the respondents rating on the five-point scale. The 13 values are listed in Table 1 in order from highest to lowest mean score based on the managers' scores. However, ranking by the percentage of public respondents who rated values very to extremely important resulted in a very similar ranking.

The Comparison

A comparison of percentages of the managers and of the public rating the importance of the same 13 wilderness values revealed some differences (Table 1). While the largest percentage of managers placed greatest importance (very or extremely important) on wilderness for the reason of knowing future generations will have wilderness to visit or otherwise appreciate, the largest percentage of the public placed greater importance (very or extremely important) on wilderness for protecting air quality and protecting water quality. Both managers and the public placed the least importance on wilderness for the reason of providing income for the tourism industry. Although managers and the public rate wilderness values somewhat differently, they both view wilderness as noneconomic resources.

In order by highest mean scores, the top five rated wilderness values by managers were as follows:

1. Knowing future generations will have wilderness areas
2. Preserving unique wild plants and animals
3. Protecting water quality
4. Protecting of wildlife habitat
5. Protecting rare and endangered species

Wilderness managers most highly rated knowing that future generations will have wilderness to visit (bequest value). They also listed very highly the stewardship of wilderness resources. In this survey, rare and endangered refers to legally designated species under the Endangered Species Act.

In order by highest mean scores, the top five rated wilderness values by the public were as follows:

- Protecting air quality
- Protecting water quality
- Protecting of wildlife habitat
- Knowing future generations will have wilderness areas
- Preserving unique wild plants and animals

Two values stand out in the public's response to the NSRE wilderness values questions as being very or extremely important: protecting air quality and protecting water quality.

Table 1 – A comparison of the wilderness values of wilderness managers and the public.

	Wilderness managers		The public	
Wilderness Values	Very or extremely important (%)	Mean score	Very or extremely important (%)	Mean score
Knowing future generations will have wilderness areas	97	3.78	90	3.31
Preserving unique wild plants and animals	94	3.60	84	3.20
Protecting water quality	85	3.30	93	3.36
Protecting wildlife habitat	84	3.26	89	3.33
Protecting rare and endangered species	79	3.15	83	3.18
Knowing that wilderness areas exists	69	2.95	78	3.06
Protecting air quality	64	2.88	93	3.40
Providing scenic beauty	64	2.85	80	3.10
Having option to visit wilderness areas in future	64	2.85	79	3.06
Providing spiritual inspiration	63	2.82	60	2.63
Preserving natural areas for science	59	2.70	67	2.82
Providing recreation opportunities	58	2.66	72	2.91
Providing income for tourism industry	10	1.39	38	2.15

Figure 1 – Wilderness managers have professional experience and training in understanding wilderness values. U.S. Forest Service rangers kayaking in Harriman Fiord within the Nellie Juan/ College Fiord Wilderness Study Area of the Chugach National Forest, Alaska. Photo by Kevin Hood.

Wilderness includes natural lands with creeks and rivers flowing from them that provide natural filters to make air and water cleaner, both inside and outside wilderness areas (ecological services). The public also highly rated knowing that future generations will have wilderness to visit (bequest value). Two additional values stand out; more than 80% indicated they are very to extremely important: protecting wildlife habitat and preserving unique wild plants and animals.

Some differences are evident between the percentages of respondents reporting a value as very to extremely important in each survey and between the mean score in each survey. However, no statistical testing was conducted between the survey data sets because the intent was to see the order in which the values would be ranked and whether respondents in each survey would rate the values equally highly. The rank ordering of the 13 values of wilderness were remarkably similar between the two surveys in spite of the different perspectives of the wilderness managers (focused on public needs and values) and the public survey (focused on personal needs and values).

The two most important differences from comparing these two surveys are (1) 58% or more of wilderness managers and 72% or more of the general public respondents rated 12 wilderness values as very or extreme important, and (2) wilderness managers and the public were generally in agreement on which are the most important wilderness values.

Implications

While differences in value ratings between managers and the citizen public are not huge, they do nonetheless exist. There are two ways to look at and interpret these differences. One is to acknowledge that managers are likely more knowledgeable about the condition of the wilderness areas they manage, and of the policies and their professional management options, than is the public. Thus, perhaps managers' ratings and rankings should be looked at as more relevant and perhaps should carry more weight in agency policy and management practice decisions. Another way to look at the differences is to acknowledge that the NWPS is citizen owned. Thus, perhaps the owners' ratings of wilderness values should carry the day. However, the best management policy and practice should consider both manager and public perspectives. As long as the

Figure 2 – The public generally values wilderness whether they are visitors or not. Here a hiker stands in the wave rock formation in the Paria Canyon-Vermilion Cliffs Wilderness managed by the Bureau of Land Management in Arizona and Utah. Photo courtesy of Mike Salamacha.

intent and legal direction of the 1964 Wilderness Act is honored, it seems there is a need both for more manager and public engagement as a means to see and allow these differences to play out in agency policy.

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wilderness managers and their staff, helping them understand how decisions made over the course of a year or more can significantly affect wilderness character.

- Wilderness character monitoring directly links the results of stewardship activities to the legislative direction of the 1964 Wilderness Act and contributes to agency transparency and accountability.
- As an integral component of monitoring, an interagency database documents evidence of trends in wilderness character. Maintaining an interagency database will not only help inform management decisions but will also promote professionalization of wilderness stewardship.
- Published guidance for wilderness character monitoring improves communications, allowing staff across different resource areas and disciplines to use common terms in discussing wilderness-related projects, needs, and impacts, and to discuss wilderness stewardship in a more open and transparent manner with the public.

Focusing on wilderness character and monitoring how it changes over time by using an affordable, practical approach that provides concrete information will help managers comply with the law, fulfill agency policies, and improve wilderness stewardship. The Wilderness Act is America's promise to itself that untrammeled lands will always be part of this nation's landscape and its ethic. Wilderness character monitoring embodies fulfillment of that promise for generations to come.

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Wilderness and the American Public

An Assessment and Comparison of Perceived Benefits of and Support for Wilderness Areas

BY RAMESH GHIMIRE, GARY T. GREEN, NEELAM C. POUDYAL, and H. KEN CORDELL

Abstract: While Americans in general perceive benefits from preserving wilderness areas, the perceived benefits may be different across subpopulation. To understand the underlying variations in perceived benefits across subpopulation, we employed a multivariate cluster analysis to data collected from a national survey regarding people's evaluation of benefits from preserving wilderness areas, and analyzed sociodemographic characteristics, outdoor recreation choices, and support for land designation and wilderness protection across subpopulation. Findings suggested relatively younger people, college graduates, females, and nonconsumptive recreationists were more likely to perceive greater benefits from preserving wilderness areas compared to their counterparts. People who perceived greater benefits from preserving wilderness areas were more supportive of land designation and wilderness protection.

Keywords: Cluster Analysis, Outdoor Recreation, Perceived Benefits, Wilderness.

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Introduction

The Wilderness Act (Public Law 88-577) was signed into law in 1965, creating the National Wilderness Preservation System (NWPS) to protect public wildlands in the United States. This massive wilderness system, which encompasses just over 110 million acres (44,515,420 ha), could not have been possible without congressional and public supports for land designation and wilderness protection (Ghimire et al. 2015).

In addition to providing opportunities for primitive experience, solitude, and unique outdoor recreation, wilderness areas provide various ecosystem service benefits, such as air and water purification, carbon sequestration, etc. Studies have shown that Americans perceive benefits from preserving wilderness areas and also want to preserve them for recreational, environmental, ecological, and economic

reasons (Cordell et al. 2008; Ghimire et al. 2015; Bowker et al. 2014). Because of the differences in sociodemographic characteristics and other perception-related factors, people may perceive benefits from preserving wilderness areas distinctly. However, previous studies have tended to treat a diverse population as a homogenous unit and, hence, failed to reveal underlying variations in the perceived benefits across subpopulation. Understanding the public's perception of wilderness benefits across subpopulation is important to help understand how the future of land designation and wilderness protection will be in the United States, given the expected changes in demographic structure in the future. This study analyzes how the American public with different demographic characteristics and outdoor recreation choices perceive benefits from preserving wilderness areas, and their views on land designation and wilderness protection.

Data and Method

Data for this study came from the National Survey on Recreation and the Environment (NSRE) conducted in 2008 (NSRE 2008). The NSRE is an ongoing series of surveys that began in 1960 as the National Recreation Survey and then eventually became the NSRE. The NSRE is a general population, random-digit-dialed telephone survey of individuals who are at least 16 years old, living in a U.S. household. The survey gathers information on a number of outdoor recreation and environmental topics, household structure, lifestyles, and demographics. Each version of the NSRE consists of different modules or sets of questions and surveys approximately 5,000 people. The data are weighted using post-stratification procedures to adjust for nonresponse according to age, race, gender, education, and rural/urban strata (Cordell et al. 2004).

A subsample of approximately 1,500 respondents was presented with a set of 13 statements measuring their perception of benefits from preserving wilderness areas, and they were asked about their views on land designation and wilderness protection (see Table 1 for the list of statements used in the survey). To introduce the wilderness module in the survey, the following statement was used:

> Wilderness areas provide a variety of benefits for different people. For each benefit I read, please tell me whether it is extremely important (=1), very important (=2), moderately important (=3), slightly important (=4) or not important at all (=5) to you as a reason to preserve wilderness areas.

The ordinal scale, used here, was also used in previous studies and refers to those benefits of preserving wilderness areas that people perceived as important (e.g., Cordell et

Table 1 – Perceived benefits from preserving NWPS, by audience segments

Reasons to preserve NWPS	Average score with 95% confidence interval in parentheses				Difference
	All sample	Wilderness avids	Wilderness moderates	Wilderness passives	
Protecting air quality	1.59 (1.55, 1.62)	1.09 (1.06, 1.11)	1.89 (1.86, 1.93)	2.52 (2.41, 2.62)	*
Protecting water quality	1.63 (1.60, 1.67)	1.18 (1.15, 1.21)	1.90 (1.87, 1.94)	2.56 (2.44, 2.67)	*
Protecting wildlife habitat	1.66 (1.62, 1.70)	1.10 (1.08, 1.13)	1.98 (1.95, 2.05)	2.85 (2.72, 2.97)	*
Knowing that future generations will have wilderness areas	1.68 (1.63, 1.71)	1.17 (1.14, 1.20)	1.97 (1.93, 2.01)	2.85 (2.72, 3.98)	*
Preserving unique wild plants and animals	1.78 (1.75, 1.84)	1.16 (1.12, 1.20)	2.12 (2.08, 2.16)	3.32 (3.23, 3.42)	*
Protecting rare and endangered species	1.81 (1.76, 1.86)	1.17 (1.14, 1.21)	2.13 (2.08, 2.18)	3.43 (3.34, 3.54)	*
Providing scenic beauty	1.89 (1.85,1.93)	1.36 (1.29, 1.40)	2.18 (2.13, 2.22)	3.19 (3.08, 3.30)	*
Knowing that in the future I will have the option to visit a wilderness area or primitive area of my choice	1.94 (1.88, 1.98)	1.34 (1.28, 1.39)	2.23 (2.18, 2.29)	3.43 (2.30, 3.54)	*
Just knowing that wilderness and primitive areas exist	1.94 (1.89, 1.98)	1.37 (1.31, 1.43)	2.23 (2.18, 2.28)	3.38 (3.25, 3.52)	*
Providing recreation opportunities	2.08 (2.03, 2.12)	1.66 (1.59, 1.72)	2.30 (2.24, 2.35)	3.16 (3.04, 3.30)	*
Preserving natural areas for scientific study	2.18 (2.13, 2.23)	1.66 (1.58, 1.72)	2.43 (2.37, 2.49)	3.51 (3.42, 3.65)	*
Providing spiritual inspiration	2.36 (2.30, 2.42)	1.92 (1.84, 2.01)	2.55 (2.48, 2.62)	3.73 (3.60, 3.87)	*
Providing income for tourist industry	2.84 (2.79, 2.90)	2.56 (2.46, 2.65)	2.98 (2.91, 3.05)	3.59 (3.47, 3.72)	*
All statements average score	1.95 (1.92, 1.98)	1.44 (1.41, 1.46)	2.22 (2.20, 2.24)	3.20 (3.08, 3.31)	*
Sample size	1,384	619	658	107	

Note: These statements were measured on a 5-point scale, 1 – extremely important and 5 – not important at all.
*Denotes differences in the average score between cluster pairs are statistically significant at a 5% level or better.

Table 2 – Demographic characteristics, by audience segments

Socio-Demographic Characteristics	Average score with 95% confidence interval in parentheses				Difference
	All sample (%)	Wilderness avids (%)	Wilderness moderates (%)	Wilderness passives (%)	
Age groups, years					
16–35	18 (16, 20)	19 (15, 21)	19 (16, 21)	17 (10, 24)	
36–50	29 (26, 30)	31 (27, 33)	29 (25, 32)	21 (14, 26)	*
51–65	35 (32, 37)	37 (32, 40)	33 (29, 36)	36 (27, 42)	
>66	18 (16, 22)	13 (10, 16)	19 (16, 23)	26 (20, 32)	*
Highest level of education reached					
Did not complete high school	5 (4, 6)	4 (3, 6)	6 (4, 8)	4 (0, 7)	
High school graduates	23 (20, 25)	19 (16, 23)	23 (20, 26)	34 (23, 42)	*
Some college or two-year degree	27 (25, 30)	27 (23, 31)	28 (23, 31)	23 (17, 30)	
Four-year college or advanced degree	45 (42, 48)	50 (45, 54)	43 (39, 48)	39 (33, 46)	*
Gender					
Male	47 (45, 50)	43 (39, 46)	49 (45, 52)	57 (49, 65)	*
Female	53 (50, 55)	57 (53, 60)	51 (46, 53)	43 (33, 52)	*
Residency					
Urban	80 (78, 82)	80 (77, 83)	83 (80, 85)	71 (62, 79)	*
Rural	20 (18, 22)	20 (16, 24)	17 (14, 20)	29 (20, 38)	*
Annual household income, US$					
<25,000	18 (15, 20)	17 (14, 20)	18 (14, 21)	17 (8, 25)	
25,000–50,000	25 (23, 28)	24 (21, 28)	25 (22, 29)	26 (16, 34)	
50,000–75,000	23 (20, 26)	21 (17, 24)	20 (17, 23)	24 (17, 32)	
75,000 >	34 (31, 37)	38 (33, 42)	37 (33, 41)	33 (25, 40)	
Ethnicity					
Whites	88 (85, 90)	86 (83, 89)	88 (85, 90)	87 (80, 93)	
African Americans	8 (6, 10)	10 (6, 13)	6 (3, 9)	5 (1, 10)	
Others	4 (2, 6)	4 (1, 7)	6 (3, 10)	8 (2, 13)	
Retired	58 (53, 61)	54 (47, 60)	57 (51, 62)	59 (49, 69)	

Note: *Denotes difference in the average score between wilderness avids and wilderness moderates is statistically significant at a 5% level or better.

al. 2008; Ghimire et al. 2015).

To segment the respondents, a K-means cluster analysis using Euclidian distancing was conducted on the series of 13 statements. Cluster analysis is a multivariate statistical technique to group a set of data in such a way that data in the same group (called a cluster) are more similar to each other than to those in other groups (clusters). A K-mean cluster analysis was preferred because it allows selecting the number of clusters to be used for analysis (Everitt et al. 2011).[1]

[1]A "Duda and Hart Index" test also supported for clustering into three groups. Distinct clustering is generally considered to be indicated by large values of the Duda and Hart index and small values of the Duda and Hart pseudo T-squared (Rabe-Hesketh and Everitt 2004).

Results and Discussions

The cluster analysis identified three unique groups of respondents (clusters) that perceived benefits from preserving wilderness areas (Table 1). One cluster called the *wilderness avids* represented those who perceived substantial benefits from preserving wilderness (average score = 1.44). In constrast, another cluster called the w*ilderness passives* represented respondents who perceived lower benefits from preserving wilderness (average score = 3.20). Between these two clusters were the *wilderness moderates*, who perceived some benefits from preserving wilderness areas (average score = 2.22). The average score for each statement differed significantly between each cluster.

Respondent Demographics

Respondents' demographics differed across clusters (Table 2). In the cluster of *wilderness avids*, 31% of respondents belonged to the 36–50 years age group, and 13% of respondents belonged to the >66 years age group. In contrast, in the cluster of *wilderness passives*, 21% of respondents belonged to the 36–50 years group, and 26% of respondents belonged to the >66 years age group. Hence, relatively younger people were more likely to be *wilderness avids*, while relatively older people were more likely to be *wilderness passives*. In the cluster of *wilderness avids*, 19% of respondents were high school graduates, and 50% of respondents had a four-year college or advanced degree. In contrast, in the cluster of *wilderness passives*, 34%

of respondents were high school graduates, and 39% of respondents had a four-year college or advanced degree. Hence, people with a college or advanced degree were more likely to be found in the *wilderness avids* cluster, while people with a high school degree were more likely to be in the *wilderness passives* cluster.

The perceived benefits from preserving wilderness areas differed, based on gender. In the cluster of *wilderness avids*, 57% of respondents were female and 43% of respondents were male, while 43% of respondents were female and 57% of respondents were male in the cluster of *wilderness passives.* Hence, females were more likely to be *wilderness avids*, and males were more likely to be *wilderness passives*.

Respondents did not differ significantly on income, ethnicity, and employment status. However, a relatively large percentage of respondents (38%) in the cluster of *wilderness avids* had an annual income greater than $75,000/year, while only 33% of *wilderness passives* had this same income level. Because of the U.S. demographics, these three clusters were dominated by whites. However, there were twice as many African Americans (10%) in the cluster of *wilderness avids* compared to the cluster of *wilderness passives* (5%), and twice as many other ethnic groups in the cluster of *wilderness passives* (8%) compared to the cluster of *wilderness avids* (4%). While 54% of respondents in the cluster of *wilderness avids* and 57% of respondents in the cluster of *wilderness moderates* were retired, 59% of respondents in the cluster of *wilderness passives* were retired.

Outdoor Recreation Choices

Respondents were divided into consumptive and nonconsumptive groups to analyze if perceived benefits of preserving wilderness areas vary among respondents based on their outdoor recreation choices. They were further divided into land-based and water-based activities, depending on their activity choices. As consumptive recreationists (e.g., hunters, fishers, etc.) are more likely to participate in some form of the nonconsumptive activity (e.g., walking, hiking, viewing, picnicking, etc.) in pursuit of their consumptive activities participation, we treated those respondents who participated in both activities as consumptive recreationists. In other words, we adopted a dichotomous classification based on whether they were consumptive recreationists (Ghimire et al. 2014).

Results indicated the clusters were dominated by nonconsumptive recreationists (land- or water-based) (Table 3). However, there were three times as many land-based consumptive recreationists in the cluster of *wilderness passives* (29%) than in the *wilderness avids* (10%). Likewise, there were twice as many water-based consumptive recreationists in the cluster of *wilderness passives* (48%) than in the *wilderness avids* (24%) (Table 3). Hence, consumptive recreationists were more likely to be *wilderness passives* than *wilderness avids*.

In the survey, 187 respondents (approximately 14% of the sample) indicated they visited wilderness areas during the past 12 months, and 53% of them belonged to the cluster of *wilderness avids.* However, 44% of them belonged to the cluster of *wilderness moderates*, and 3% of them belonged to the *cluster of wilderness* passives (Table 3). Hence, respondents who visited wilderness areas were more likely to be *wilderness avids* or *wilderness moderates*.

Land Designation and Wilderness Protection

Two key statements about designation of natural land as wilderness and wilderness protection were analyzed to examine if respondents belonging to different clusters had different attitudes toward wilderness designation and protection. In

Table 3 – Outdoor recreation choices, by audience segment

Outdoor recreation participation	Average score with 95% confidence interval in parentheses				Difference
	All sample (%)	Wilderness avids (%)	Wilderness moderates (%)	Wilderness passives (%)	
Land-based recreation activities					
Consumptive	14 (11, 17)	10 (8, 12)	12 (9, 15)	29 (21, 36)	*
Nonconsumptive	86 (84, 88)	90 (88, 92)	88 (85, 90)	71 (63, 78)	*
Water-based recreation activities					
Consumptive	29 (27, 32)	24 (21, 27)	28 (23, 32)	48 (40, 55)	*
Nonconsumptive	71 (69, 73)	76 (73, 79)	72 (68, 76)	52 (43, 61)	*
Visited wilderness areas (N = 187)		53 (50, 56)	44 (41, 47)	3 (0, 8)	

Note: *Denotes difference in the average score between wilderness avids and wilderness moderates is statistically significant at a 5% level or better.

Table 4 – Public opinions on land designated and wilderness protection, by audience segments

Land designated as wilderness protection	Average score with 95% confidence interval in parentheses				Difference
	All sample (%)	Wilderness avids (%)	Wilderness moderates (%)	Wilderness passives (%)	
Not enough	52 (49, 54)	64 (60, 68)	48 (44, 52)	7 (2, 11)	*
About the right amount	34 (31, 36)	26 (22, 29)	38 (34, 42)	61 (53, 67)	*
Too much	4 (3, 5)	2 (0, 3)	3 (2, 4)	23 (16, 30)	*
Don't know	10 (8, 11)	8 (5, 9)	11 (8, 13)	9 (4, 14)	

Note: *Denotes difference in the average score between wilderness avids and wilderness moderates is statistically significant at a 5% level or better.

particular, the first question asked if the respondents thought the current amount of land Congress has designated as wilderness was enough. The second question asked the respondents if they supported designating more federal lands in their state as wilderness. Results indicated 64% of respondents in the cluster of *wilderness avids* and 48% of respondents in the cluster of *wilderness moderates* said the current amount of land Congress has designated as wilderness is "not enough," compared to 7% of respondents in the cluster of *wilderness passives* (Table 4). In contrast, 61% of respondents in the cluster of *wilderness passives* and 38% of respondents in the cluster of *wilderness moderates* said it is "about the right amount," compared to 26% of respondents in the cluster of *wilderness avids* (Table 4). To sum, respondents in the *wilderness avids* cluster were more likely to believe the current amount of land that the Congress has designated as wilderness is not enough, and respondents in the *wilderness passives* cluster were more likely to believe it about the right amount.

In the second question, 81% of respondents in the cluster of *wilderness avids* and 69% of respondents in the cluster of *wilderness moderates* favored (somewhat or strongly) designating more federal lands in their states as wilderness, compared to 25% of respondents in the cluster of *wilderness passives*. In contrast, 39% of respondents in the cluster of *wilderness passives* opposed (somewhat or strongly) designating more federal lands in their states as wilderness, compared to 10% of respondents in the cluster of *wilderness moderates* and 5% of respondents in the cluster of *wilderness avids* that opposed this proposal (Table 5). Hence, *wilderness avids* or *wilderness moderates* were more likely to favor designating more federal lands as wilderness, compared to *wilderness passives*.

Discussion and Conclusion

Public views on wilderness are important determinants of continued political support for land designation and wilderness protection (Stankey 2000). It is, thus, important to understand how people with different demographic characteristics and outdoor recreation choices value perceived benefits from preserving wilderness areas. Agencies and conservation groups may find this information valuable to understand characteristics of the public who perceive benefits from preserving wilderness areas distinctly and focus their education/outreach to garner additional support for land designation and wilderness protection. As *wilderness passives* or *wilderness moderates* perceive fewer benefits from preserving wilderness areas, educating them on a wide range of wilderness benefits may help in increasing their support for wilderness protection and land designation.

Table 5 – Public opinions on land designation and wilderness protection, by audience segments

Land designation and wilderness protection	Average score with 95% confidence interval in parentheses				Difference
	All sample (%)	Wilderness avids (%)	Wilderness moderates (%)	Wilderness passives (%)	
Strongly favor	45 (42, 47)	60 (55, 63)	36 (32, 39)	7 (2, 11)	*
Somewhat favor	26 (24, 28)	21 (17, 24)	33 (29, 36)	18 (11, 24)	
Neither favor nor oppose	16 (14, 18)	11 (9, 13)	20 (16, 22)	31 (21, 38)	*
Somewhat oppose	7 (5, 8)	4 (2, 6)	7 (5, 9)	17 (9, 23)	*
Strongly oppose	4 (3, 5)	1 (0, 2)	3 (1, 4)	22 (14, 30)	*
Don't know	2 (1, 3)	2 (1, 3)	2 (0, 3)	4 (0, 7)	

Note: *Denotes difference in the average score between wilderness avids and wilderness moderates is statistically significant at a 5% level or better.

It is, thus, important to understand how people with different demographic characteristics and outdoor recreation choices value perceived benefits from preserving wilderness areas.

These findings also help convey the potential implications of future demographic changes on land designation and wilderness protection in the United States. Because of expected structural changes, the share of elderly people, females, college graduates, urban residents, and nonconsumptive recreationists is expected to grow in the future (Shrestha and Heisler 2011; Bowker et al. 2012). A larger share of elderly people could have a negative effect, but a larger share of females, urban residents, college gradautes, and nonconsumptive recreationists could have a positive effect on land designation and wilderness protection. Regardless of the nature of demographic changes, investment in outreach and education campaigns is likely to lead to greater support for land designation and wilderness protection in the future. However, more research is warranted to ascertain net effects of demographic changes on the future of wilderness protection. Finally, statistical analyses used in this study examine the behavior of a group in general, but they may fail to reveal the underlying variations among subsegments therein. Hence, the results may not be generalizable to specific individuals.

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Congress Establishes New Wilderness Areas

. . . and the Correct Total Acreage of Our National Wilderness Preservation System

BY DOUG SCOTT

On August 7, 2015, President Barack Obama entered the Cabinet Room and, with pleased members of Congress and conservation leaders looking on, signed the Sawtooth National Recreation Area and Jerry Peak Wilderness Additions Act establishing three new wilderness areas near Sun Valley in central Idaho. As he lifted his pen from the vellum, 277,665 acres (112,367 ha) had been added to our National Wilderness Preservation System:

- Hemingway-Boulders Wilderness: 67,998 acres (27,518 ha)
- White Clouds Wilderness: 90,769 acres (36,733 ha)
- Jim McClure-Jerry Peak Wilderness: 116,898 acres (47, 307 ha)

Doug Scott in the proposed Scotchman Peaks Wilderness, which spans the Idaho/Montana border in the Panhandle near Sandpoint, Idaho.

Protection of this landscape was not achieved readily; it has been fought over for generations. In the late 1960s, a huge mining company revealed plans for an open pit molybdenum mine at the base of Castle Peak – imagine a huge hole, a tailings pond covering 5 to 6 miles (8 to 9.6 km) of creek, a processing mill, access roads, power lines, and all the other components of a major mining operation.

In the face of this threat to the wild White Clouds, Idaho conservationists got organized. Hearings throughout Idaho showed that, with the exception of the Challis area, Idahoans overwhelmingly supported protection of the wild Boulder-White Clouds. Republican governor Don Samuelson was all for the mine, saying it would only impact barren sagebrush lands. In 1970, Democrat Cecil Andrus defeated Samuelson, having heavily focused on his opposition to any mine.

Priorities for Idaho wilderness advocates and the congressional delegation turned elsewhere, notably the Frank Church-River of No Return Wilderness and the Owyhee canyon country, and various political factors stood in the way, but local advocates were undaunted. As always, their work is the story of the success of these new wilderness areas. The key: the tireless advocacy of conservative Republican representative Mike Simpson, the local congressman.

Enactment of this major wilderness law midway through the first session of the 114th Congress allows the

Idahoans overwhelmingly supported protection of the wild Boulder-White Clouds.

Figure 1 – The Jim McClure-Jerry Peak Wilderness. Photo by Ken Straley

focus to shift to other bills actively working their way through the House and/or Senate. These would designate more than 1,600,000 acres (647,497 ha) in California, Colorado, Tennessee, Nevada, Washington, New Mexico, and Oregon … with more bills expected to be introduced. All enjoy broad local support.

As a side note, with these additions, our National Wilderness Preservation System now protects 110,290,380 acres (44,632,933 ha) in 765 units. This is not the figure you will find under "Fast Facts" about the system at www.wilderness.net, as they exclude – for various reasons I do not agree with – 287,998 acres (116,548 ha) of lands and waters within the congressional boundary of the 1,098,057-acre (444,367 ha) Boundary Waters Canoe Area Wilderness.

DOUG SCOTT was a lobbyist for The Wilderness Society and the Sierra Club, and the wilderness advocacy arm of The Pew Charitable Trust from 1968 to 2013, working with many of the members of Congress who played key roles in enacting and implementing the law. He is author of The Enduring Wilderness: Protecting Our Natural Heritage through the Wilderness Act (2004); and travels giving talks about the history and bipartisan politics of the Wilderness Act and its implementation; email: scottdoug959@gmail.com

Assessing Wilderness Values

The Tasmanian Wilderness World Heritage Area, Australia

BY MARTIN HAWES, ROGER LING, and GRANT DIXON

Martin Hawes.

Roger Ling.

Grant Dixon.

Introduction

The values associated with wilderness are diverse and sometimes subtle, and cannot be fully accounted for in quantitative terms (Landres et al. 2008). For example, no amount of data can fully convey the ecological significance of a pristine landscape, nor can one measure the sense of awe that a visitor might feel when standing in its midst. It is nevertheless possible to identify some of the key physical and geographical attributes that are necessary and sufficient for an area to qualify as wilderness, and to a large extent it is possible to quantify these attributes. Assessments based on such measurements can be used to estimate the extent and quality of existing or potential wilderness across a given region and can be a useful tool for protecting, maintaining, and enhancing wilderness values. In this article, the term *wilderness value* will be used to denote the extent to which a place or region exhibits key physical and geographical attributes that may define it as wilderness.

A number of wilderness-assessment methodologies have been developed, ranging from simple area-counts to complex algorithms that take a wide range of factors into account. In the United States, for example, mapping methodologies have been developed to monitor and manage wilderness character, based on indicators such as untrammeled quality and remoteness from occupied areas (Landres et al. 2008; Tricker et al. 2013). While some methodologies take account only of geographical conditions such as the location of roads, others incorporate subjective assessments contributed by wilderness users and/or the general public (Kliskey and Kearsley 1993; Carver et al. 2002).

In the mid-1980s the Australian Heritage Commission developed a wilderness-assessment methodology as the basis for a nationwide wilderness inventory (Lesslie and Maslen 1995). The National Wilderness Inventory (NWI) methodology identifies remoteness and naturalness as the key components of wilderness value, defining

remoteness as distance from human structures and disturbances such as buildings, dams, and logging areas. Rather than attempting to distinguish wilderness from nonwilderness, the methodology assesses wilderness value as a continuum ranging from urban to pristine. The methodology was used to assess wilderness value across Tasmania and other parts of Australia in the late 1980s and 1990s, and it has since formed the basis for several studies in Europe (Henry and Husby 1995; Carver et al. 2002).

The NWI methodology remains the most comprehensive system yet employed for quantitatively assessing wilderness value in Australia.

Although the NWI methodology is the most comprehensive wilderness-assessment methodology yet developed in Australia, it has some deficiencies. In particular, it takes no account of the influence of terrain and vegetation on access remoteness. In an attempt to address this deficiency, British researchers Fritz and Carver (1998) developed an algorithm for taking walking times into account, based on assumptions about walking speeds across different gradients of terrain. Similar algorithms have been employed in subsequent wilderness-value surveys (e.g., Tricker et al. 2013).

The current study focused on the Tasmanian Wilderness World Heritage Area (TWWHA) – a 1.4-million hectare (3.5 million acre) region (expanded to 1.6 million hectares in 2013 since this study was undertaken) that encompasses one of the last great tracts of temperate wilderness on Earth (Parks and Wildlife Service 1999). It is a wild and largely undeveloped (i.e., free of the impacts and infrastructure of modern civilization) part of Tasmania, Australia's island state, containing a range of natural and indigenous cultural values that led to the listing as a World Heritage Area in 1982. The landscape includes formerly glaciated mountain ranges, thickly forested valleys, open plains, and an extensive rugged coastline. While it contains in excess of 1,300 kilometers (808 miles) of mostly rough walking tracks (trails), much of the country is untracked. The area hence provides some of the best opportunities for self-reliant recreation in the Australasian region.

Prior to the NWI assessment, at least two attempts had been made to assess the wilderness values of the region that is now the TWWHA. Kirkpatrick and Haney (1980) calculated wilderness values across a 4 kilometer x 4 kilometer (2.49 mile x 2.49 mile) grid (refined to 2 km x 2 km [1.24 mile x 1.24 mile] where boundaries were complex). They defined wilderness value as a function of the remoteness and biophysical primitiveness of each square, and defined remoteness as the time required to access the location on foot. Hawes and Heatley (1985) took a simpler approach, defining wilderness as land more than eight kilometers (4.97 miles) (nominally a half walking day) from the nearest roads, dams, and similar disturbances. Using this definition they assessed the potential impact on wilderness of projected logging operations in areas adjacent to the then recently listed TWWHA. The NWI approach was applied statewide in 1995 as part of a process (the Regional Forest Agreement) to identify areas that qualified for reservation from future industrial-scale logging. This 1995 assessment formed the comparative baseline for the current study.

The first objective of the current study was to assess the changes in wilderness value that had occurred across the TWWHA since 1995 by reapplying the NWI methodology (as described below) to the region using updated geodata. The second objective was to repeat the assessment of current wilderness value using a revised methodology that was designed to address some of the deficiencies mentioned earlier.

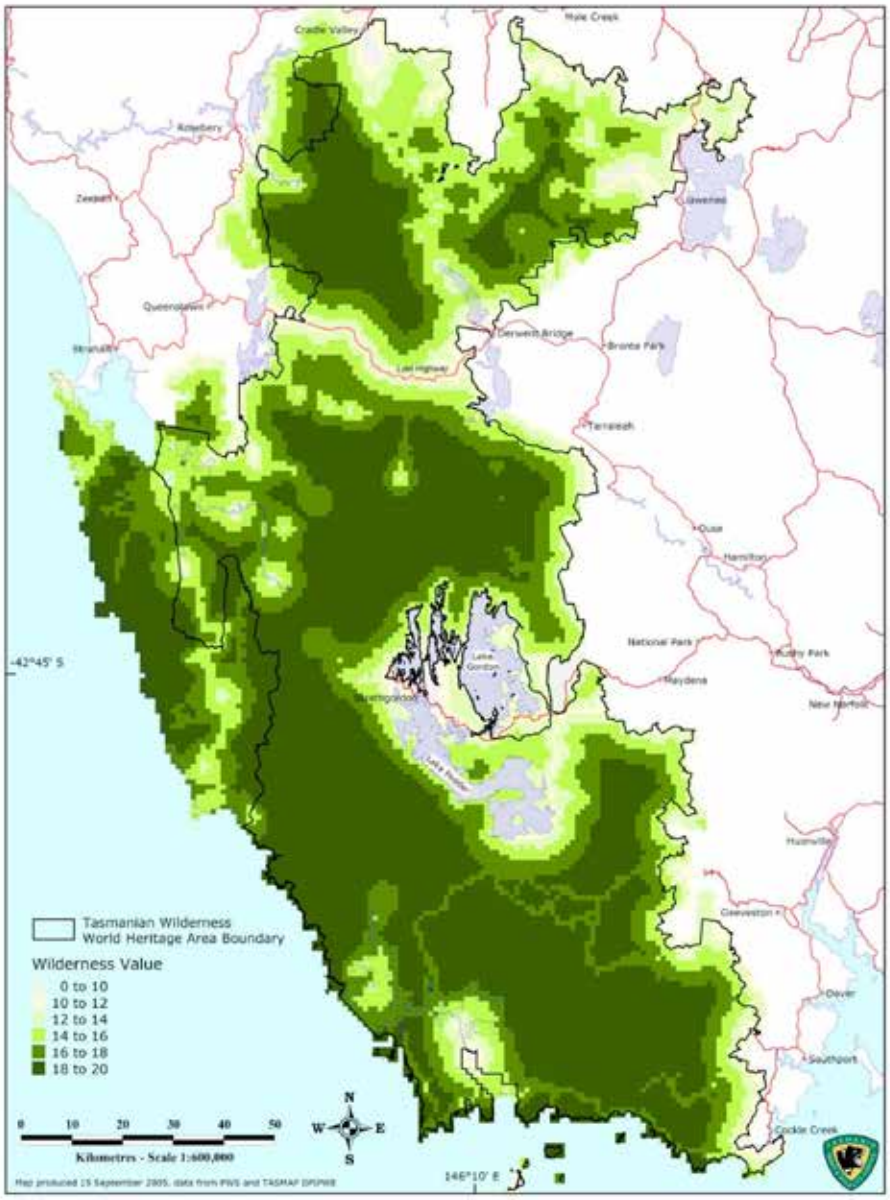
No attempt was made in this study to assess the impact of viewfield disturbances, although it was acknowledged that development of such a technique could enhance future wilderness-value mapping.

Measuring Wilderness Values Using the NWI Methodology

Component Variables of Wilderness Value

In the NWI methodology, the variable Wilderness Value (WV) is assigned to each square in a grid covering the region of interest. The grid resolution can be selected to suit the size of the region and the resources available for the analysis. A 1 kilometer (0.62 mile) grid was used for this study (see Map 1).

Wilderness Value was measured as the sum of four variables: Remoteness from Settlement (RS), Remoteness from Access (RA), Apparent Naturalness (AN), and Biophysical Naturalness (BN). The first three of these variables are distance based, the value assigned



Map 1 – Distribution of wilderness values in 2005 calculated using the National Wilderness Inventory (1995) methodology; 1-kilometer (.62 mile) grid. The maps show the TWWHA boundary in 2005, at the time the study was undertaken. As noted in the text, the reserve was expanded somewhat in 2013.

to each grid square depending on the remoteness of the square's center from specified types of geographical features. Each category of geographical feature is assigned a weighting to reflect its relative impact on wilderness values. For example, it is assumed that roads have substantially greater impact on wilderness values than walking tracks (trails). In the formula for calculating Remoteness from Access (RA), walking tracks and roads are weighted so that the impact of a walking track one kilometer (.62 mile) distant is equivalent to that of a major road 9 kilometers (5.59 miles) distant.

The relationship is illustrated in Figure 1; the curves illustrate the formulas used to calculate Remoteness from Access as a function of distance from various geographic features. For example, a location 5 kilometers (3.11 miles) from a walking track would have an RA value of approximately 7. If the point were also 10 kilometers (6.21 miles) from a major road, its RA value would be reduced to 4.

Remoteness from Settlement is a function of the minimum map distance from towns and smaller settlements, weighted according to population. Apparent Naturalness, which is a measure of how "wild" or "undeveloped" an area might seem to a visitor, is a function of the distance from the nearest nonnatural features such as roads, impoundments, and transmission lines.

Biophysical Naturalness values are determined by environmental conditions (such as logging and grazing history) within each square and measured on a scale of 1–5 with values determined by a list of condition classes.

The study area encompassed the entire TWWHA (as per its 2005 boundaries), together with adjacent areas that were largely free of major development features such as dams or roads. Wilderness values within the study area were calculated using data on geographical features located within a 30-kilometer (18.6 mile) radius of the area.

Data Sources

The primary data source for the study was the Tasmanian government's GIS database, which contains geodata on roads, impoundments, vegetation types, and a wide range of other geographical features. These data were supplemented by information from a variety of sources, including satellite imagery and local knowledge. For example, some clearfelled (clear-cut) areas that were visible on satellite images but not recorded on available GIS layers were manually traced from georeferenced satellite imagery using

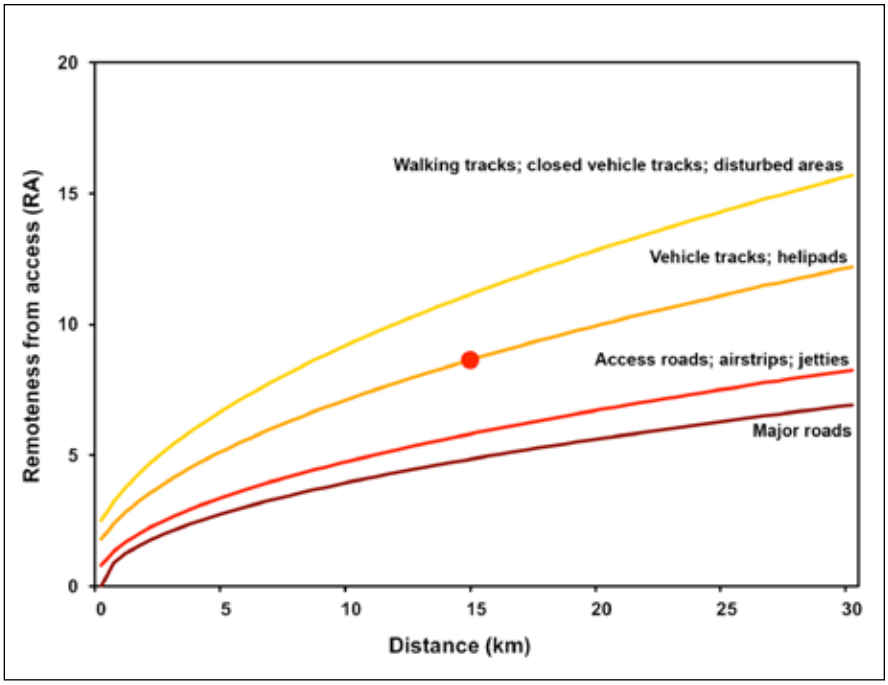


Figure 1 – Remoteness from Access varies according to the map remoteness from different types of geographic features. For example, a location 15 kilometers (9.32 miles) from a helipad (indicated by the red dot) would have an RA rating of approximately 7.

the MapInfo polygonal drawing tool. Most of the data sources were known to have been current in 2002 or later.

The analysis was undertaken using MapInfo Professional software and the scripting language MapBasic. The latter was used to calculate the minimum distance from the centroid of each grid square in the study area to the nearest relevant point, polyline, or polygonal disturbance feature (such as a road or an area of logged forest). The calculation was made by creating a small circular search zone around each centroid, and progressively increasing the radius of the zone until the relevant feature was found.

The authors had access to the output data from the 1995 analysis, but not to the geodata on which this analysis was based. Hence it was possible to compare the wilderness value measured in 1995 and 2005, but it was not possible to explain all the observed differences.

Developing a Modified Wilderness-Assessment Methodology

Rationale for Modifying the Methodology

As noted earlier, the NWI methodology has a number of shortcomings. The principle shortcomings are:

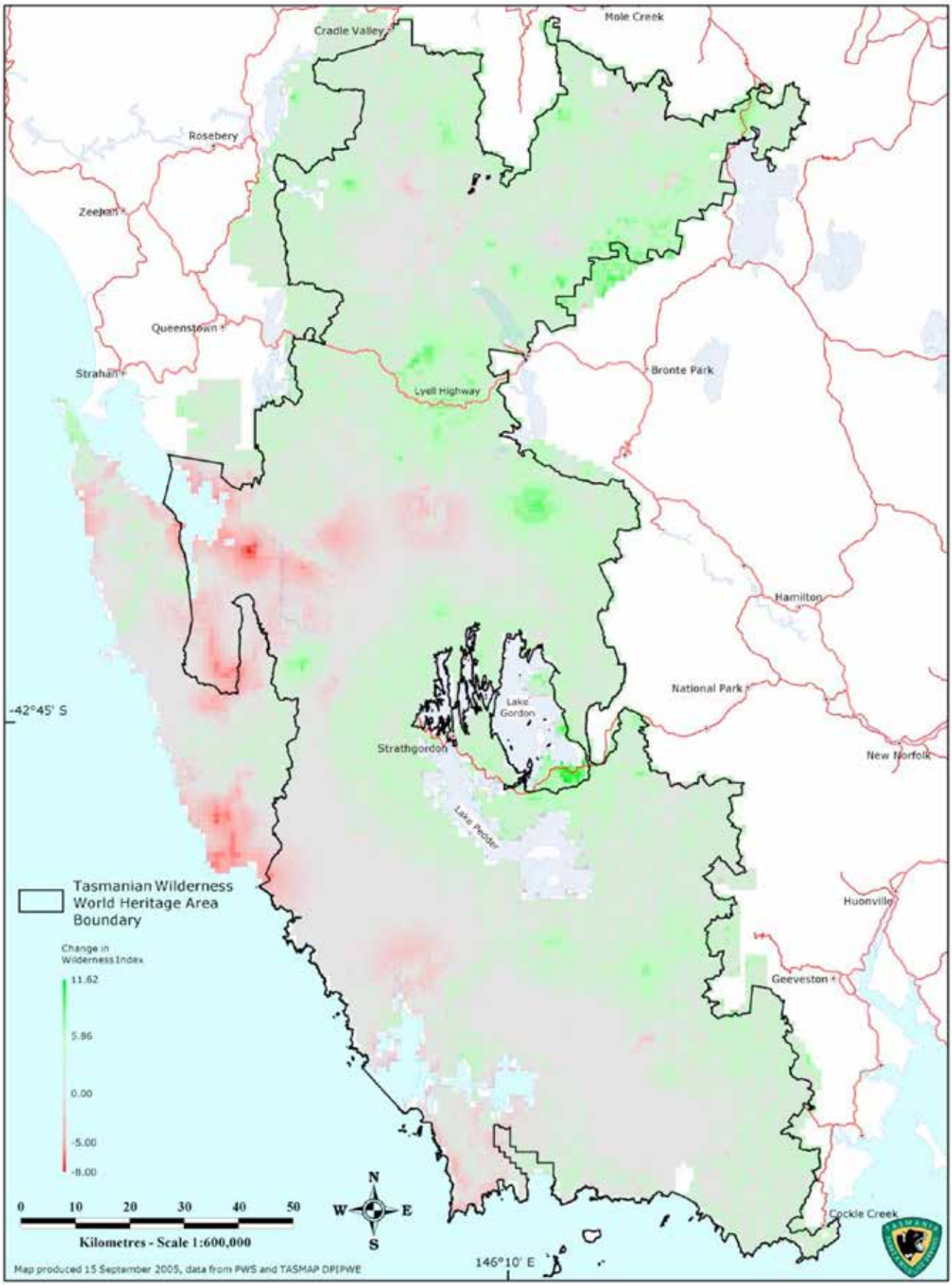
1. Remoteness of Access as defined under the NWI system is not a reliable indicator of the time required to access off-road areas because it takes no account of terrain, vegetation, or the standard of walking tracks. For example, two locations 5 kilometers (3.11 miles) from the nearest road can have the same RA rating, even though one may be accessed in a couple of hours across open country and the other may take days to reach through Tasmania's notoriously dense vegetation.
2. The weightings assigned to some categories of geographical feature under the NWI methodology are arguably inappropriate. For example, a walkers' hut (cabin) has the same impact locally on wilderness value as a major road or hydroelectric impoundment.

Details of the Modifications

The primary modification was to replace the variable Remoteness of Access with a new variable, Time Remoteness (TR), defined as the shortest nonmechanized traveling time from points and corridors of mechanized access. It is possible to write computer algorithms to calculate Time Remoteness using GIS data on vegetation types, terrain slopes, and typical walking speeds (e.g., Tricker et al. 2013). However such algorithms can never be entirely reliable because they cannot take account of local (unmapped) factors such as variations in the density of forest understory and the impassability or otherwise of steep terrain. They also require computing resources beyond those available for the current study (Fritz and Carver 1998).

Time Remoteness was therefore assessed manually by the authors, using map-based information supplemented by their own firsthand knowledge of the TWWHA. The risk of bias in this approach was considered to be adequately minimized by the fact that each of the authors had walked extensively throughout the region over a period of 40 years. Specifically, the authors identified "contours" of access remoteness that were respectively half a day, one day, and two days remote by foot or raft from the nearest point of mechanized access, thereby dividing the region into four zones that were subsequently assigned numerical TR values.

Changes were also made to the weighting conventions for RS and AN to correct the anomalies noted



Map 2 – Change in wilderness values that have occurred between 1995 and 2005, calculated using the National Wilderness Inventory (1995) methodology; 1 kilometer (.62 mile) grid.

in (2), earlier. For example, small settlements were given slightly lower weightings relative to large towns.

The variables Remoteness from Settlement and Apparent Naturalness were redefined as functions that increase asymptotically to 5 as remoteness increases. Using this approach, changes in wilderness value can be analyzed even in very remote areas because the "perfect" value of 20 can never be reached.

Results

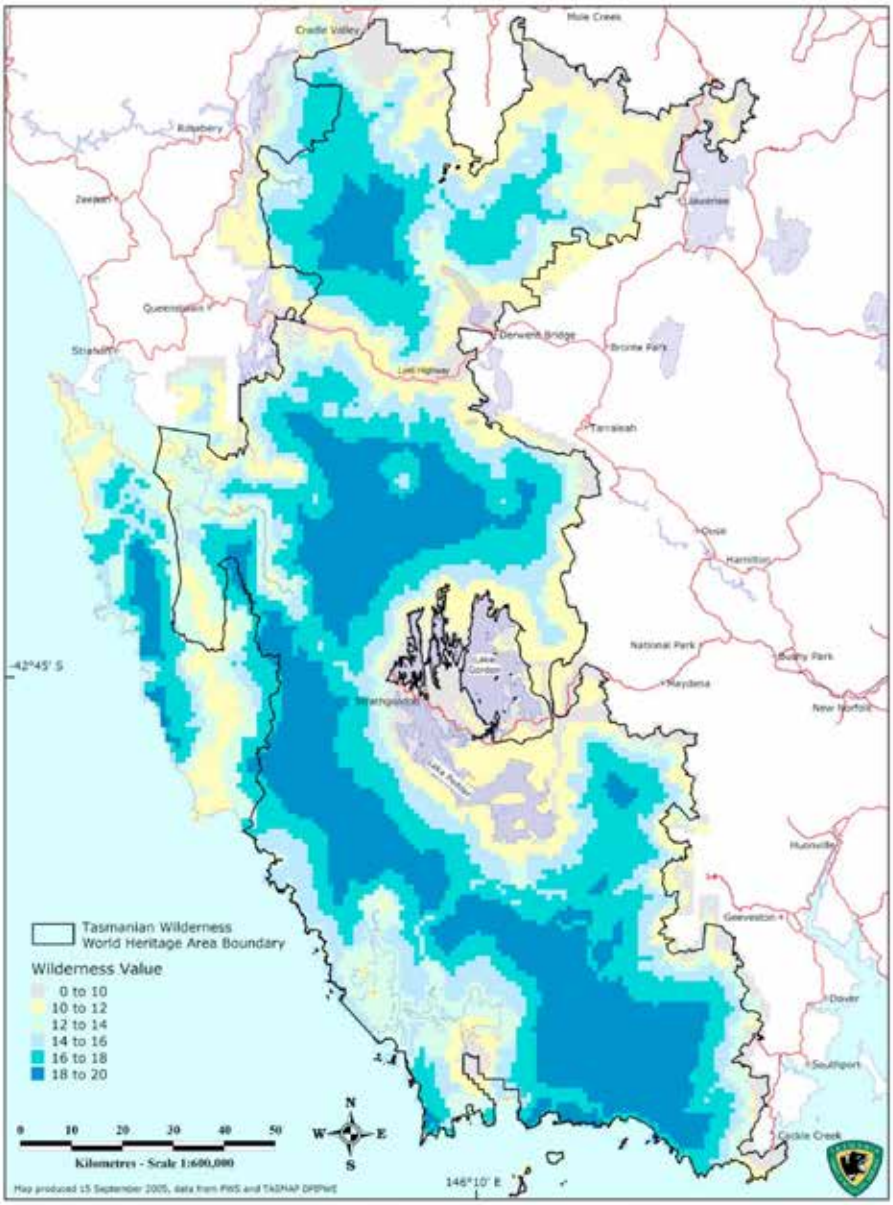
Assessment of Current (2005) Wilderness Values Using the NWI Methodology

Map 1 shows the distribution of current wilderness values using the NWI methodology. For the sake of simplicity, Maps 1–3 show only major roads and towns. Wilderness Values of less than 10 have been combined as a single group because they correspond to areas of low to very low wilderness value and are of less interest in terms of wilderness management.

Map 1 reveals that a substantial part of the entire region has wilderness value in the range of 18–20, the highest category under the NWI system. Areas with lower wilderness value are located mainly around the fringes of the region.

Note the dramatic impact of hydroelectric impoundments, such as the two large impoundments near the center of the map, and of the Lyell Highway, which dissects the region along an east-west axis. Note also the impact of walking tracks, which account for the corridors of lighter shading in some of the more remote areas.

The isolated but substantial "holes" in regions of high wilderness value are mainly due to the presence of remote buildings. The large area of low wilderness value in the southwest corner of the region is due to the presence of a settlement that includes buildings, a mine, and an airstrip.



Map 3 – Distribution of wilderness values in 2005 using the revised methodology described herein; 1 kilometer (.62 mile) grid. Note the zones in this map cannot be directly compared to those in Map 1, as they have been derived by a different methodology.

Comparison of Wilderness Values, 1995–2005

Map 2 shows the changes in wilderness value that occurred between 1995 and 2005. No significant losses or gains in Wilderness Value were recorded in areas shaded with neutral gray. The darker red areas recorded a reduction in WV of at least 5, and the darker green areas recorded an increase of at least 5.

Most of the wilderness losses correspond to known developments such as recent tourist infrastructure or the expansion of walking tracks. Some apparent losses appear to be explained by the omission of features such as vehicle tracks from the original 1995 dataset. (Since the dataset is unavailable, this cannot be confirmed.)

Most of the gains in Wilderness Value can be explained by the closure,

removal, or natural reclamation of features such as vehicle tracks, airstrips, and huts.

Assessment of Current (2005) Wilderness Values Using the Revised Methodology

Map 3 shows the current distribution of Wilderness Values across the TWWHA as measured by the revised methodology. Note that because they were derived by a different methodology, the zones in this map cannot be directly compared to those in Map 1. While the overall picture is not greatly different from that obtained using the original NWI methodology, closer inspection reveals significant differences.

One difference is that the revised methodology indicates higher impacts due to major artificial features such as roads and impoundments, and lower impacts due to buildings and low-grade walking tracks. Also in the revised methodology, powered-boat access has a major impact on wilderness values on the west and southwest coast because points on coastlines where powered boats can easily put ashore are assigned a Time Remoteness value of zero.

In some areas, significant changes in the distribution of Wilderness Value are evident as a result of the inclusion of vegetation and terrain in the calculation of Time Remoteness. The greatest disparity between Time Remoteness and Remoteness from Access occurs in the northeast of the study area, where walking speeds are generally quite fast (due to the relative openness of country in this area).

Discussion

The NWI methodology remains the most comprehensive system yet employed for quantitatively assessing wilderness value in Australia. The main advantage of using the methodology in its original form is that this allows comparison with studies that have used the same methodology, either in other areas or in the same area at a different time.

The revised methodology proposed in this article corrects several shortcomings of the NWI methodology. In particular, the replacement of Access Remoteness with Time Remoteness highlighted the impact of mechanized boat access and deemphasized the impact of minor walking tracks on Wilderness Value.

If sufficient resources were available, automating the assessment of Time Remoteness would increase the reproducibility of this variable. This approach has been adopted, for example, by Tricker et al. (2013) and Carver et al. (2013). However, the accuracy and reliability of automated calculations will depend on the extent to which available data such as vegetation type and terrain maps can be interpreted to estimate typical walking speeds.

An important caution for any approach to wilderness mapping utilizing spatial data, highlighted by Tricker et al. (2013), is to be mindful of the source data (e.g., accuracy, completeness, and scale of any GIS layer) when considering any resultant wilderness quality maps. It is also important to note that maps such as those derived in this study do not necessarily represent the less tangible or more personal qualities of wilderness, the perception of which inevitably varies with the individual.

The NWI and revised methodologies are based solely on geographical data. However, both methodologies inevitably involve subjective decisions about the influence of factors such as accessibility and naturalness. In future studies it may be possible to make this subjectivity more explicit by allowing wilderness users and other interested parties to assign their own weightings to identified components of wilderness value (such as the impact of huts, tracks, or roads), as proposed by Carver et al. (2002) and other researchers, but this approach does not yet seem to have been pursued.

The wilderness concept, and wilderness-value mapping in particular, has to some extent fallen out of favor in Australia in recent years. Sawyer (2015) postulates various reasons for this, ranging from a narrowing view of the rationale for conservation by ecologists to its inconvenience for various political agendas. Nevertheless public concern for wilderness remains strong, as shown by the controversy generated by the 2014 release of a draft management plan for the TWWHA (ABC News 2015) that deemphasizes wilderness and greenlights mechanized access and tourism development in remote areas (DPIPWE 2014). Perhaps partly in response to this controversy, the Tasmanian government has now embarked on a program to remap the wilderness values of the TWWHA.

In a global context the importance of wilderness remains widely recognized. Wilderness has been assigned its own category under IUCN's classification system for protected areas (Dudley et al. 2012), and wilderness preservation is an explicit management objective for many national parks and similar reserves around the world (Suh and Harrison 2005). As a tool for objectively assessing the likely impact of proposed developments on wilderness quality, and for determining the extent and condition of the planet's remaining

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Announcements

COMPILED BY GREG KROLL

Gwich'in Tribal Leader Receives 2015 Robert Marshall Award

The Wilderness Society's highest honor, the Robert Marshall Award, is bestowed on one person each year who has never held public office but who has had a notable influence on conservation and the fostering of an American land ethic. The 2015 award was presented to Sarah James who, along with other tribal leaders, has defended the Arctic National Wildlife Refuge from oil drilling, protecting the heart of the wildlife habitat and coastal plain of the refuge for the past 25 years. She received the award in Washington, D.C.

Sarah James was raised in a traditional Gwich'in way of life in the small Alaskan community of Arctic Village. She did not begin speaking English until she was thirteen. She credits the hard work of the Gwich'in and other people throughout the United States and the world as having greatly contributed to her successful efforts to protect the Arctic Refuge.

James has received many awards in recognition of her leadership in recent decades, including a Ford Foundation Leadership for a Changing World grant. In 2009, she was inducted into the Alaska Women's Hall of Fame. (Source: The Wilderness Society, June 18, 2015)

Wes Henry National Excellence in Wilderness Stewardship Award Recipients Are Announced

The National Park Service (NPS) annually recognizes outstanding contributions to wilderness preservation and stewardship with the Wes Henry National Excellence in Wilderness Stewardship Awards.

The 2014 Wes Henry Individual Award recipient was Ray O'Neil, Zion National Park, Utah. He was recognized for his skilled management of the park's unique Plateau District, involving significant off-trail and technical slot canyon visitation. Ray pioneered an efficient online wilderness permitting system and implemented the park's Wilderness Stewardship Plan. He served as chair of the Intermountain Region's Wilderness Executive Committee and represented wilderness managers on the NPS National Wilderness Leadership Council in 2013. Ray O'Neil has since transferred to Saguaro National Park, Arizona, to serve as chief ranger.

The 2014 Wes Henry Group Award honored staff at Zion National Park; Lake Mead National Recreation Area, Arizona/Nevada; and Parashant National Monument, Arizona; for developing the Concrete to Canyons Partnership (C2C), acquainting 100 underserved fifth graders and their families from Las Vegas, Nevada, with the Zion wilderness. Striving to foster lifelong connections to national parks and their wilderness areas, this three-day, two-night wilderness camping experience included ecology lessons, wildlife observations, and a night sky program where students used telescopes to view the Milky Way.

The NPS C2C core team members honored by the group award are:

- Zion NP: Alyssa Baltrus, Barb Graves, Eleanor Hodak, Billie Rayford, Bryanna Plog, Kimberly Diamond, and Cheryl Leonard-Buick
- Lake Mead NRA: Kevin Turner, Amanda Dworak Roland, and Thomas Valencia
- Parashant NM: Rosie Pepito, Amber Franklin, and Chelsea Moody

(Source: National Park Service Wilderness Stewardship Division)

BLM Names New Director of National Conservation Lands Program

The Bureau of Land Management (BLM) has selected longtime public lands manager Kristin Bail to head the Bureau of Land Management's (BLM's) 15-year-old National Conservation Lands program at the agency's Washington, D.C., headquarters. The National Conser-

Submit announcements and short news articles to GREG KROLL, *IJW* Wildernss Digest editor. E-mail: wildernessamigo@yahoo.com

vation Lands System encompasses 874 units and more than 330 million acres (12 million ha) of public lands across the nation.

Bail was most recently forest supervisor in North Carolina with the U.S. Forest Service. She has more than 30 years of experience in public lands management in Oregon, Arizona, North Carolina, and Washington, D.C. She began her federal career as a student trainee in the BLM's Oregon State Office and has extensive experience in field positions as well as in policy and leadership roles throughout the BLM and Forest Service, including a staff position in the BLM's National Conservation Lands System. Bail grew up in Phoenix, Arizona, and has a bachelor of science degree in geology from Washington State University. (Source: wildernessalliance.org/news, July 30, 2015)

Idaho's Boulder-White Clouds Finally Have Designated Wilderness

Forty years have passed since environmental groups began pushing to establish designated wilderness in Idaho's Sawtooth Mountains. In 2002, Idaho's Republican representative Mike Simpson began working on a bill to designate wilderness there while simultaneously helping the surrounding rural communities of Custer and Blain Counties. The bill was introduced in 2004 and killed in 2006. Representative Simpson tried again in 2010 but was stymied by motorized recreation groups. Finally, working with Senator Jim Risch in a seven-month collaborative effort to secure broad support from conservation groups, motorized recreation interests, local communities, and even the antiwilderness Idaho Farm Bureau, President Barack Obama, on August 7, 2015, signed the complex legislation that had taken so many years to pass.

H.R. 1138 designated three new wilderness areas, totaling 275,665 acres (110,000 ha):

- Hemingway-Boulders Wilderness, comprising 67,998 acres (28,000 ha) within the Sawtooth and Challis National Forests
- White Clouds Wilderness, comprising 90,769 acres (37,000 ha) within the Sawtooth and Challis National Forests
- Jim McClure-Jerry Peak Wilderness, comprising 116,898 acres (47,000 ha) in the Challis National Forest and Challis District of the Bureau of Land Management (BLM)

The bill gives the Forest Service and the BLM three years to draft wilderness management plans. In addition, four wilderness study areas were released back to multiple use:

- Jerry Peak Wilderness Study Area
- Jerry Peak West Wilderness Study Area
- Corral-Horse Basin Wilderness Study Area
- Boulder Creek Wilderness Study Area

Several other provisions were incorporated in the legislation, including the following:

- No roads currently open to vehicles, or trails that are currently open to two-wheeled motorized use, will be closed.
- All areas currently open to mountain bikes outside of the newly designated wilderness will remain open.
- Permittees with current grazing allotments within and adjacent to the new wilderness areas will be allowed to voluntarily retire their grazing permits and be eligible for compensation from a third-party conservation group.
- More than $5 million in grants will be provided to Custer County and surrounding communities for a community center, a county health clinic, and emergency medical technician support.
- More than $5 million in grants will be provided to the Sawtooth National Recreation Area for trail maintenance and improvements.

(Sources: *Idaho Mountain Express*, August 10, 2015; *Idaho Statesman*, July 27 and August 4, 2015)

China Proposes to Establish a National Park System

The Chinese government has launched a national park pilot program to preserve natural areas in nine provinces over the next three years. According to state news reports, President Xin Jinping came up with the national park idea in December 2013. The plan, which was developed with support from the Chicago-based Paulson Institute, strives to protect some areas of China where environmental tourism has become more focused on economic gains than preserving the natural resources that draw visitors. A trial park area has been identified in a mountainous coastal region in the Wuyishan area of Fujian Province. In Yunnan Province, local officials have already conducted their own experiment with park conservation by establishing the Pudacuo Protected Area. (Source: *New York Times*, June 10, 2015)

Denali National Park Strives to Discourage Internet Posting of Trip Itineraries

Rangers at Denali National Park, Alaska, are now asking backcountry hikers not to post precise maps of their routes on the Internet when they return home. Turn-by-turn instructions for GPS devices have the potential to threaten what is supposed to be a trailless wilderness by encouraging hikers to follow identical routes, inadvertently creating growing social trails. "If someone says this is the greatest campsite ever and then everyone camps there on a published route, we're going to see impacts," according to Denali backcountry ranger Michael Raffaeli.

Last summer, rangers began adding the request to not publish, or follow, GPS routes as part of a safety talk visitors are required to hear before they camp overnight in the backcountry. In the past, the Park Service has asked popular tour book publishers Lonely Planet and Rough Guides to refrain from posting overly specific backcountry routes in their Alaska guidebooks. "They've been very cooperative and very happy to provide the type of message that we like to provide here [by] not providing specific route information," said Rob Burrows, a wilderness resource specialist at Denali. On the other hand, according to Raffaeli, *Backpacker Magazine* has been a prominent source of turn-by-turn backcountry itineraries in the park.

Although Denali receives more than half a million visitors per year, most of the park is trailless for a reason, offering hikers a wild experience that's rare in U.S. national parks outside of Alaska. Adolph Murie is credited with inspiring the park's trailless philosophy by firmly opposing trail construction recommended in the 1950s as part of the Park Service's Mission 66 development plans. "Let the tourist be on his own, and not be spoon-fed at intervals," Murie wrote in a 14-page opposition to the Mission 66 trails plan. "Let him be encouraged to keep his eyes open, do his own looking and exploring, and catch what he can of the magic of wilderness." (Source: *News Miner*, July 12, 2015)

Bolivia Gives Fossil Fuels Extraction Precedence over Preservation

In 2013, Ecuador's president, Rafael Correa, reneged on his promise to shield Yasuni National Park in the Amazon jungle from oil development (*IJW* Digest, April 2014). In 2014, Peru essentially gutted the Ministry of the Environment, auctioning off 70% of the Peruvian Amazon to oil companies for exploration and allowing mining and fossil fuel exploitation in any newly established protected area (*IJW* Digest, August 2015). And now Bolivia has followed suit. On May 20, 2015, a new law was declared specifically permitting "the development of hydrocarbon exploration activities in the different zones and categories within protected areas." More than 20 million hectares (50 million acres) across Bolivia have been identified, with contracts signed, opening them up to oil and gas development.

Madidi National Park, in northwest Bolivia, is one of the most biodiverse places on the planet (*IJW* Digest, April 2013). It hosts 11% of the world's bird species. And although Bolivia's government calls Madidi a protected area, 75% of its 1.8 million hectares (4.5 million acres) are overlapped by oil and gas concessions held by Spain's Repsol; Brazil's state oil and gas company, Petrobras; and PetroAndina, a joint venture between the Bolivian and Venezuelan state companies. Madidi is just one of 22 protected areas in Bolivia that are now threatened by the new government policy; 11 of those areas are already overlapped by oil and gas concessions.

According to Jorge Campanini of Bolivia's Documentation and Information Center, the discoverers of a potentially commercially viable deposit within a protected area can demand that SERNAP (Bolivia's park service) reconfigure the park boundaries. Campanini says that "the protected area and its [land-use] zonification would be re-drawn according to oil exploitation criteria rather than the criteria of conservation and protection."

Carmen Capriles, representing the grassroots organization Reacción Climática, laments that "this is absolutely not the kind of policy we expected from President Morales after such big speeches and discourses about Mother Earth and Pachamama and how we should start living in harmony with her. ... What we have seen in these nine or ten years of government is that our natural resources and our forests – the richness of Bolivia – have been depleted much more than during any other period of time." (Source: *The Guardian*, June 5, 2015)

Success Is Achievable While Respecting the Intent and Letter of the Law

Section 4(c) of the U.S. Wilderness Act dictates that, with few exceptions, within designated wilderness there shall be no motor vehicles or motorized equipment, no other form of mechanical transport, and no structure or installation.

These restrictions apply equally to federal managers and the general public. It is sometimes argued that accomplishing large, necessary projects in wilderness is impractical or impossible while respecting these legal restraints. Two recent examples belie that claim.

In Lassen Volcanic National Park, California, a February 2015 windstorm knocked down hundreds of trees along an 8-mile (13 km) stretch of the Pacific Crest Trail that traverses the park's northern boundary. Eight volunteer Pacific Crest Trail Association crosscut sawyers worked with six members of Lassen's trail crew for four days to buck out 368 downed trees along the trail, as well as an additional 50 trees in an adjacent area to the south. The project attracted some of the most skilled volunteers and crosscut saw enthusiasts from across northern California. The 17-mile (27 km) section of the Pacific Crest Trail running through Lassen Volcanic National Park is now clear of fallen trees.

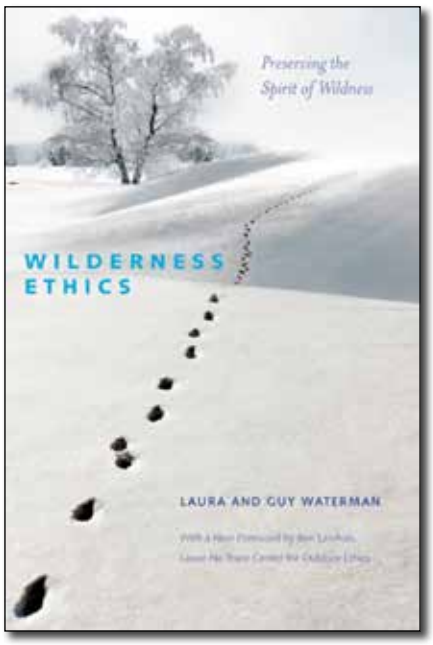
The Eagles Nest Wilderness in Colorado presented a decidedly different challenge. For years, the U.S. Forest Service wrestled with how to remove a 1950s-era building in the wilderness, formerly associated with the nearby Boss Mine. The building was an eyesore as well as a hazard that attracted curious hikers. White River National Forest employees considered using dynamite, heavy machinery, all-terrain vehicles, pack mules, and/or wheelbarrows to remove the structure. Ultimately, they decided the least impactful option would be to contract with a crew of prison inmates who would demolish the structure with hand tools and willpower and then carry out the cinderblocks and chunks of flooring and roofing. On one day alone, the crew members averaged 16 miles (26 km) a day hiking back and forth from the building site to the trailhead, half of those miles while carrying out 50 pounds or more of bricks and cement. "It's rough, but your body gets used to it," said Andy Camacho, one of the 18 inmate crew members. "Being out like this in the wilderness is definitely nice." (Sources: National Parks Traveler, July 19, 2015; *Summit Daily News* [Colorado], July 9, 2015)

Book Reviews

JOHN SHULTIS, BOOK REVIEW EDITOR

Wilderness Ethics

By Guy and Laura Waterman. 2014. Countryman Press, Woodstock, VT. 240 pp. $16.95 (pb).



When the book *Wilderness Ethics: Preserving the Spirit of Wildness* was first published in 1993, it became a warning cry to many of us. With large numbers of visitors and well-meaning but overzealous management building more into undeveloped areas with helicopters and radios blaring, what was happening to our wildlands?

The Watermans helped frame the issue: "Preserving the spirit of wildness requires action on at least two entirely distinguishable fronts. In the first place, the more obvious forms of destruction – industrialization, whether by miners or the recreation industry or second-home developers – must be fended off from significant blocks of natural lands. But after that, we must decide what we are preserving that land for: the preserved land must be treated with respect for its wild character, its internal integrity, the spirit of the land" (p. 27). Above all else, 20 years ago the Watermans asked us to care for the spirit of the land, not just the physical reality, but for the spirit of wildness.

Fast-forward to 2015: We have recently celebrated the 50th anniversary of designated American wilderness and there are more than 108,000,000 acres (43,706,049 ha) of designated wilderness in the United States and thousands of public and private wildernesses throughout the world. A reader might naturally wonder if so many years later Guy and Laura's writing on preserving the spirit of wildness is still relevant.

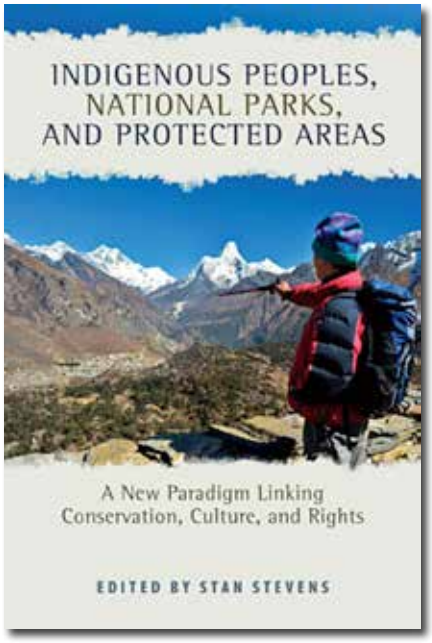
Wilderness Ethics covers a lot of ground in identifying threats to wildness, from large groups and helicopters to radios, search and rescue, and scientific research. On the latter point they ask, "Is there left any cold waste of ice where no motor drones and no scientific progress is made, where man is not doing any beast any favors, where some great white animal pads silently its solitary way under a sky full of stars, alone?" (pp. 222–223). Looking at today's issues it is easy to see that some of the names have changed but many of the underlying problems remain the same. Cell phones have replaced – and far surpassed – radios, and well-intentioned research often leads to degradation of wilderness values.

Many years ago the Watermans noted that "the clash of wilderness preservation versus use and enjoyment by thousands is inherently unresolvable. But that does not absolve any of us from striving to resolve it, from doing the best our generation can to preserve the spirit of wildness. …The purpose of this book is not to get you to agree with a program or philosophy of ours, but to try to help all of us think about ideas that matter" (p. 29). Indeed, 25 years later the ideas still matter and the spirit of wildness remains under constant threat. We must keep asking the difficult questions of what it means to preserve wildness, even if the answers seem elusive. Whether for the first time or for the tenth, anyone who cares about what wildness means and how we can protect it would do well to read or reread this book.

REVIEWED BY REBECCA ORESKES, author and former U.S. Forest Service wilderness specialist; email: echotuck@gmail.com.

Indigenous Peoples, National Parks, and Protected Areas: A New Paradigm Linking Conservation, Culture, and Rights

Edited by Stan Stevens. 2014.University of Arizona Press, Tucson. 400 pp. $39.95 (pb).



Conservation is currently caught in the wake of two conflicting paradigms. The original version from the 19th century, often called "fortress conservation" or the "exclusionary model," expressly outlawed Indigenous presence, often using forced removal of these peoples from their traditional territories. The "new" model, a more "inclusionary" and "rights-based" model, first appeared in the 1970s but has been increasingly influential in the local, national, and particularly international conservation realms. Stan Stevens's new book "explores the sea change in thinking about protected areas and Indigenous peoples and examines both encouraging and cautionary experiences with implementation of the new paradigm" (p. 9).

The first of three sections in this book provides an overview of both paradigms and two case studies from Australasia and Alaska, which gauge conservation agencies' adjustments to the new paradigm. The second section uses four additional case studies from North and South America to further examine the complexities of moving to a new conservation paradigm. The final section focuses on how to move forward, using three case studies of successes and failures from South Africa, Guatemala, and Nepal as well as a concluding chapter from Stevens. This final chapter highlights best practices and barriers to achieving progress in moving to the new paradigm.

Wilderness is discussed throughout the book in a variety of ways. For example, while Stevens states early in the book that "the new paradigm does not (as many assume) deny the value of nature protection or wilderness. Strict nature protection can be appropriate and just if it has Indigenous peoples' free, prior, and informed consent; fully and effectively involves them in governance; and does not violate rights" (p. 8). However, it is also noted that the wilderness concept's separation of nature and culture does not fit with most Indigenous peoples' worldviews (p. 11) and that conservation agencies used the concept of wilderness to help exclude Indigenous peoples from their homelands (p. 39). This reflects the mutual skepticism between wilderness supporters and proponents of the new paradigm: both fear the challenges each paradigm brings to their worldviews, attitudes, and values.

Rather than merely championing the new paradigm, the authors critically review the existing barriers to moving forward and note both the successes and failures of existing rights-based conservation efforts. For example, shared governance agreements (e.g., co-management) still "privilege Western science and science-based techno-managerialism and ignore, trivialize, or distort Indigenous peoples' science, knowledge and expertise" (p. 303); there is a continued lack of capacity in both Western and Indigenous agencies; and the impact of long-standing inequalities, including overt and covert forms of racism and "othering" within Western culture.

This book provides a passionate, well-researched call to arms, an insightful acknowledgment of key barriers, and a forward-looking vision that deserves a wide readership among wilderness and conservation proponents.

REVIEWED BY JOHN SHULTIS, book review editor of the *IJW* and associate professor at the University of Northern British Columbia; email: john.shultis@unbc.ca.

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wilderness areas, wilderness mapping has the potential to play an important role in achieving this objective.

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For the young conservationists in your family

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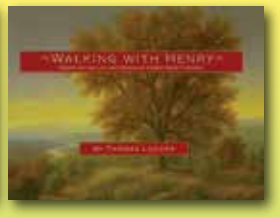

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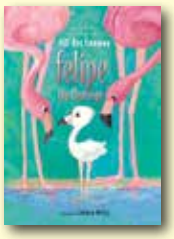

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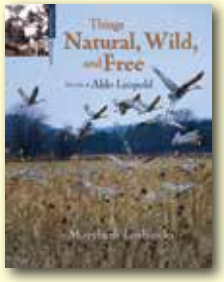

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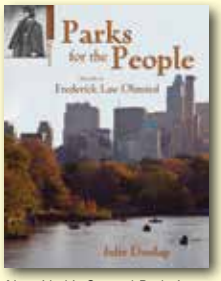

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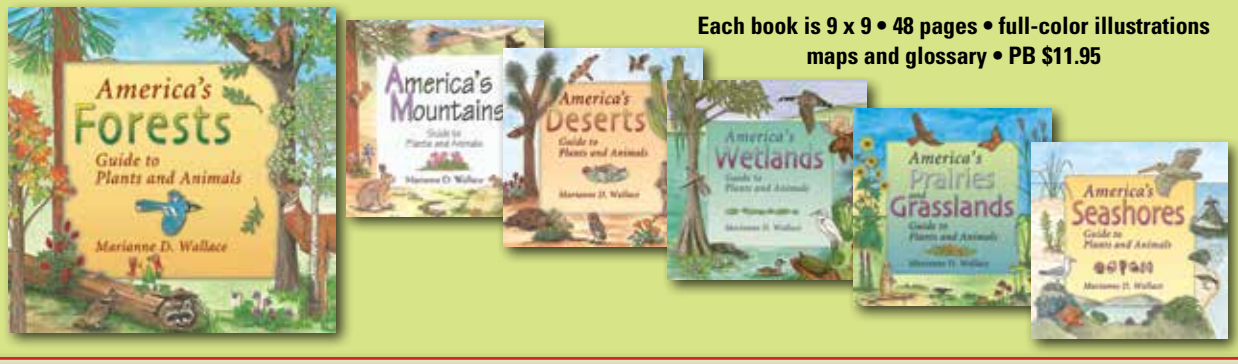

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