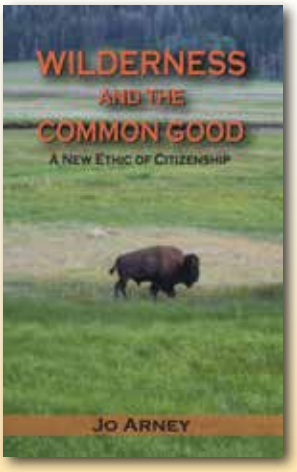
INTERNATIONAL

Journal of Wilderness

In This Issue

- Young People in Wilderness
- Relationships with Native Peoples
- Personal Locator Beacons
- Hornbills in Kafue National Park

APRIL 2016 VOLUME 22, NUMBER 1



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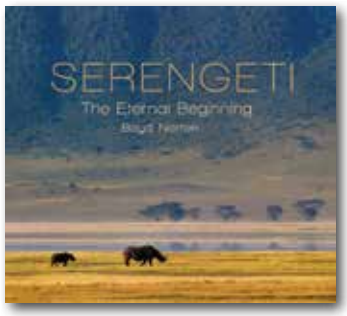

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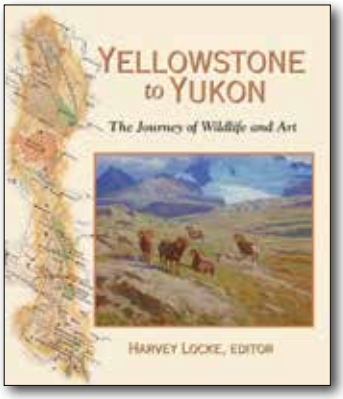

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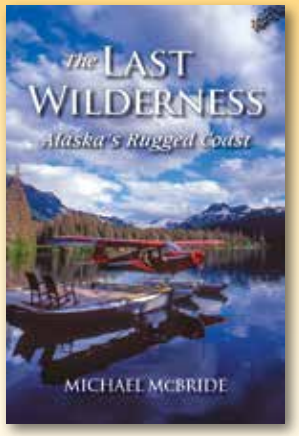

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—John C. Hendee,
IJW Editor-in-Chief Emeritus

On the Cover

Main image: The rare, endangered desert-adapted elephants of the Gourma region of central Mali (West Africa) on their annual migration, the longest ever recorded for African elephants.

Inset image: A Fulani woman from Central Mali, West Africa

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

Identifying with Wilderness

Fording the Daunting Confluence of Caucasoids, Negroids, Mongoloids, Native Peoples, Millennials, Baby Boomers, Veterans, Hunters, and Recreationists in Protecting Our Wild Landscapes

BY LISA RONALD

I've chosen to pen this title in the style of Glenn Nelson, the Trail Posse founder and journalist whose similarly labeled 2015 National Wilderness Workshop keynote presentation poked fun at the bureaucratic, wordy, doom-laden, and colon-heavy way in which wilderness people would describe one of the most profound challenges our movement faces. During the October 2015 workshop in Missoula, Montana, more than 200 wilderness management agency employees, seasonal staff, nonprofit leaders, scientists, and students converged to discuss the implementation of the federal agencies' *2020 Vision* plan for future wilderness stewardship. The workshop offered opportunities for *2020 Vision* implementation team leaders to share information and receive feedback from nonprofit partners. This purposeful confluence of established wilderness professionals and young conservation up-and-comers provided a unique context to discuss, among other large and lingering wilderness stewardship issues, the topic of cultural, generational, and recreational inclusivity.

Discussions raised several important questions. How do we better engage millennials through escapism in digital storytelling, rebuild their confidence in government, and create clear, productive, and fulfilling career paths for them to work in wilderness management and advocacy? How do we move from including token minorities to fostering a culture of wilderness that simply sees minorities as typical? How can we think more creatively about working with the increasingly powerful recreation sector and other less conventional stakeholders on wilderness designations, while not compromising the core definition of wilderness in legislation? How can we gently nudge the old guard into truly trusting that the new guard will successfully protect wilderness, even if we don't do it the same way?

Lisa Ronald

I do not mean to imply that this gathering was a place where our movement yet again spun its wheels over the same wicked problem, even as the calls to "diversify or die" get louder. In fact, the partnership with the University of Montana as local host of the workshop along with participation by students, new conservation leaders, veterans, and other recreation groups provided a successful model for future gatherings and revealed sound evidence that a substantive level of diversification within our movement is already occurring.

Over the next five years as implementation of *2020 Vision* works to address its broad goals, which acknowledge inclusivity, it is the hope that federal government and nonprofit partners will continue to collaborate throughout. Future gatherings of this kind should once again become a staple, and perhaps our understanding and articulation of inclusivity can become adhocratic, simpler, and hopeful.

LISA RONALD is the national wilderness communications coordinator for the Wilderness Institute at the University of Montana; email: lisa@wilderness.net.

SOUL OF THE WILDERNESS

Where Are the Young People in Wilderness?

BY CHRISTINA MILLS and MONICA PATEL

"Where are the young people … Why aren't they here?" asks William Tweed (2010), a former park ranger in his rich and thoughtful book titled *Uncertain Path: A Search for the Future of National Parks*. Framed as a reflection on the past, present, and future of wilderness stewardship as he hikes the John Muir Trail from Yosemite National Park through Sequoia and Kings Canyon National Parks, Tweed gives articulate and poignant insight into some of the toughest questions facing wilderness managers. At one point along Tweed's geographic and contemplative journey, he postulates that the lack of young people in wilderness may be due to an increasing culture of fear in our day-to-day lives, the irresistible pull of technology as a source of entertainment, or, "perhaps the kiss of death for wilderness use by the young is the perception that it is something their parents do, or at least did."

Concerns about how to engage young people to maintain the relevance of wilderness over the next 50 years were common at the 2014 National Wilderness Conference and have arisen in many of our university classroom discussions and personal conversations with federal agency staff. Worries that many young people no longer recreate in wilderness, experience wilderness more quickly and with more technology than previous generations, are not involved in wilderness stewardship, or will somehow drop the ball in the coming decades seem to be increasingly prevalent.

As young people engaged in wilderness stewardship ourselves, we would like to counter some of these concerns by demonstrating that there are many of us who find wilderness highly relevant and would like to get involved in wilderness stewardship but are encountering numerous barriers to doing so. We present one model for engaging smart, motivated young people in wilderness management, and discuss what we believe are key characteristics and practices for the next generation of wilderness leaders.

Christina Mills. Photo by National Park Service.

Monica Patel. Photo by Michael Brochard.

There certainly is something to the idea that exposure to wild places breeds a love for them, as famously described by Richard Louv in *Last Child in the Woods* (2008), and our population is indeed urbanizing (National Parks Second Century Commission 2009). But a childhood filled with wilderness experiences is not necessarily a prerequisite for raising a wilderness steward. In fact, neither of us grew up with much exposure to wilderness or public lands. Christina grew up in Charlotte, North Carolina, a southeastern metropolitan area of more than 2 million people. Monica, first generation Indian American, was raised in the densely populated state of New Jersey. Neither of us grew up camping, and neither of our families took summer road trips to national parks. Despite our urbanized upbringings, we both developed a deep connection to wild places, a connection strong enough to catalyze careers in wilderness and public lands. We just needed a vehicle that allowed us to convert that connection into a viable professional pursuit. For us, it was through the Wilderness Fellows Program.

The Wilderness Fellows Program was created in 2010 with funding from the National Park Service to advance

wilderness stewardship while providing young professionals and recent college graduates an opportunity to gain valuable career experience. The program expanded to include the US Fish and Wildlife Service and the US Forest Service so that over the next five years, 50 wilderness fellows would provide on-the-ground support to help staff integrate wilderness character into monitoring, planning, and management. For each wilderness area, fellows collect and compile data to produce baseline assessments for local wilderness character that address the special and unique qualities of each wilderness and assist staff in a variety of ways to improve wilderness stewardship, such as conducting staff training or developing a multiagency database (Figure 1).

Figure 1 – Releasing bycatch of blue crab from diamond terrapin survey traps at Davis Bayou, Gulf Islands National Seashore. Photo by Bill Crouch, USFWS.

Another goal of the Wilderness Fellows Program was to recruit bright young minds to field-test the interagency wilderness character framework, Keeping it Wild (Landres et al. 2008). With this direct contact between national-level wilderness managers and wilderness character monitoring in the field, the national wilderness leads interested in institutionalizing wilderness character were able to get a pulse on what was working on the ground and what needed revisiting. This rare direct connection informed wilderness policy guidance, handbooks for the field, and led to more effective practices in wilderness areas themselves. The Wilderness Fellows Program had a positive impact system-wide. It started a subtle forward movement, bringing agency staff at all levels and across disciplines to the table for the exchanging of ideas and perspectives.

By the end of 2014 and the mark of the 50th anniversary, the US Fish & Wildlife Service had completed wilderness character assessments for all 64 wilderness refuges, the National Park Service had assessed wilderness character for 9 wildernesses, and the Forest Service had completed assessments for 5 wildernesses. The 2015 wilderness fellows have been incorporating wilderness character monitoring data into a multiagency database and updating wilderness character measures based on lessons learned in the field. Another result has been the immeasurable benefit of introducing 50 young professionals as wilderness fellows to potential careers in wilderness stewardship.

In addition to the on-the-ground impact, our involvement in the wilderness fellows program built the foundation of personal relationships with wilderness that inspired both of us to pursue careers in wilderness stewardship and public land management. It afforded us the rare opportunity as fellows to participate in management team meetings, work with agency staff across divisions, foster connections with future mentors, and opened numerous doors within the agencies.

Over the past few years, we have received dozens of inquiries from our peers asking, "How do I get your job?" or "How do I land a career in wilderness stewardship?" Some are peers from college or graduate school, yet many are peers from our hometowns: intelligent, urban, young people looking for something meaningful. They are often discouraged by their attempts to apply for jobs in conservation, having hit barrier after barrier. They are frustrated by multiple rejections from the federal hiring system and the mystery of applying as someone without knowledge of how the hiring system works. While there are many young people and recent graduates who would love to take a National Outdoor Leadership School course, volunteer, or apply for a summer internship, student loans have often meant they cannot afford expensive programs, unpaid internships, or minimal stipends. To get young people involved in wilderness stewardship, we need more programs that are both financially supportive and provide leadership skills and meaningful networking rather than manual labor alone.

Meaningful networking is important. We are both fortunate

to have positions with the National Park Service today because we have been inspired by some great wilderness leaders before us. For each of us, there have been at least four or five people who have opened doors and who have become our champions and advocates. These people created a space through genuine interest in the next generation with the foresight to recognize a need to inspire the future stewards of wilderness. They did this in part by relaxing the hierarchical structure within these agencies to directly interface with youth who would otherwise not be able to engage in meaningful conversations with wilderness managers. Our own experiences, contrasted with the frustrations expressed by our peers, have made us firm believers in the power of mentorship, and it is programs such as Wilderness Fellows that are so critical for creating the opportunity to build those relationships.

After these initial connections are made comes the equally difficult task of moving from a fellowship position to a federal position within the agency. In the field of wilderness stewardship and in some other agency directorates, there can be missing bridges between a fellowship, internship, or entry-level and management-level positions. As David Cole notes in the April 2015 issue of this journal, "Investments in training and experiential knowledge are lost as wilderness stewards leave their jobs in order to be promoted, and those in wilderness leadership positions lack extensive wilderness experience" (Cole 2015). One possible way to address this would be to formalize more entry- and mid-level wilderness roles into the hiring system. By highlighting the intersection with wilderness in relevant job announcements, those interested in a career in wilderness may be able to more easily navigate the often-cumbersome federal job search. For example, positions reflecting wilderness stewardship responsibilities in job titles or position descriptions (e.g., wilderness interpretive ranger or wilderness facilities specialist) are easily recognizable and could help young people transition into a career while demonstrating the interdisciplinary nature of wilderness management. Furthermore, championing the interagency wilderness program as a funding priority cannot be ignored as an important part of the solution.

"The wilderness leaders of the future are out there; they're just looking for a way in."

We've both spoken to countless young people who are very interested in a career in wilderness stewardship, so to Tweed's speculation that wilderness recreation is something our parents did and is therefore something in which our generation will not participate, we say, not necessarily. The wilderness leaders of the future are out there; they're just looking for a way in. In fact, the number of potential wilderness leaders is likely growing – to the extent that protected and wilderness areas can increase their relevance and accessibility to more diverse populations, the greater the potential for new leaders.

So who are these new wilderness leaders? What skills will it take to manage wilderness in an era of rapidly changing demographics and technology, in which our understanding of the complexity and uncertainty in our social and ecological environment is greater than ever? There isn't an easy answer to these questions, but what we do know is that the wilderness leaders of tomorrow will need to be able to communicate and manage at broader scales. They will need to think systemically and work across disciplines.

As we grapple with tough issues such as climate change, we will need to balance the need for science and new technology with humility and restraint (Figure 2). The next generation of wilderness leaders and public land managers will need to incorporate more social science because resource management is often about understanding social and political forces at play, on a variety of different scales. We need to invest in understanding people's values, motivations, and relationships with wilderness, especially as climate change causes us to reflect on a number of possible futures that may look very different from the past.

The next generation of wilderness leaders will have to build bridges across disciplines and divisions. Within parks, forests, and refuges, it becomes increasingly important for staff to make the connection to the ways in which their job impacts wilderness, not how wilderness impacts or limits their job. By cultivating a wilderness ethic within agencies, or even within one's park, forest, or refuge, staff will better understand their role in preserving wilderness and be able to integrate a consciousness into operations occurring or impacting it. One way that units with wilderness have successfully done this is by hosting a wilderness fellow.

Wilderness professionals will have to balance being bold and respectful. At times it takes listening to others' perspectives in order

to be heard in return. A healthy and thoughtful dialogue around stewarding wilderness in a changing world is important. Other times, informed boldness is warranted when situations arise that boil down to a decision compromising the spirit of wilderness. In these moments, someone needs to hold the line and be a voice, an advocate for wilderness.

Importantly, tomorrow's leaders will need to carry on the spirit of mentorship from which they benefited. We can, however, start today. So think of that person that helped you get where you are today and strengthened your relationship with wilderness, and pay it forward.

For more information about the Wilderness Fellows Program, contact Nancy Roeper (nancy_roeper@fws.gov).

Figure 2 – Exploring the Glacier Bay Wilderness, Glacier Bay National Park.

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Learning Shoulder to Shoulder

The Story of a Successful Wilderness Partnership

BY BILL HODGE, JIMMY GAUDRY, and MICHELLE MITCHELL

While driving through the hills of eastern Tennessee in 1934, a small cadre of friends became engaged and then embroiled in an animated conversation about the steps necessary to protect the limited wildlands remaining in the United States. That conversation gave birth to The Wilderness Society, which led decades later to the passage of the Wilderness Act. That group of friends and colleagues represented a cross section of public and private professionals: Harvey Broome, a lawyer and passionate conservationist from Knoxville, Tennessee was in the car with three federal employees – Bob Marshall and Bernard Frank from the United States Forest Service (USFS) and Benton MacKaye, then of the Tennessee Valley Authority, passionate advocates for the preservation of all things wild. Their views represented perspectives from both inside and outside of the federal land management prism, but these views shared enough in common to buttress the future of the National Wilderness Preservation System.

Since that fortuitous car ride, service to the idea of, and stewardship for, wilderness has come from deeply committed individuals whether they hold an agency position, a role in professional conservation, or are just someone with an inspired commitment to volunteerism. This article examines the partnership between the Southern Appalachian Wilderness Stewards (SAWS) and the Southern Region of the USFS. It describes the creation of this partnership and documents several keys to its ongoing success. Overall, it shows that a shared vision and shared commitment to wilderness between agency professionals and private sector partners is alive and well.

Bill Hodge and Jimmy Gaudry.

Michelle Mitchell.

Empowering Partnership: An Agency Perspective

A popular commercial offers an amusing way to think about the words we use in the partnership community. The scene starts with two people sitting in a waiting room. One turns to the other and says, "Did you know 15 minutes can save you 15% or more on car insurance?" The other says exasperatedly: "Everybody knows that. But did you know words really can hurt?" The scene then switches to a western movie parody. A lone man is riding off into the sunset. The words *The End* descend through the hazy technicolor sunset and downward as the man rides on, dust kicking from his horse's hooves. Not a second later, the rider is literally knocked from the saddle and onto the ground by the physical presence of the letters on the scene. The viewer is left to snicker at the absurdity of the word's actual presence on the horizon causing the rider to fall and hurt himself.

Partnering would be so much easier if potentially hurtful words took physical form and knocked us in the head. But they don't. Instead, words of our organizations' leaders are constantly, but subtly, interpreted by all who hear them. Eventually a collective interpretation emerges that, whether accurate or not, and whether conscious or not, forms an understanding of the leader's intent and point of view. This understanding, in turn, affects staff interactions with each other and with the outside world. The interpretations become self-reinforcing, weaving themselves into organizational culture and affecting the lens through which all opportunities are viewed. When repeated enough, even the most innocent, but slightly off-kilter words can result in a challenging organizational culture. In the partnership world, a challenging organizational culture can knock down a good idea or initiative faster than even the worst rider can be thrown from a horse.

The US Forest Service strives to build a culture that embraces the talents and contributions of all people, both inside and outside the federal agency. The agency acknowledges that conservation is difficult, challenging, and complicated. Success depends on the full complement of vested stakeholders acting together. People and organizations from all walks of life, not just agency employees, are needed to care for wilderness and protected areas and to actively steward their future.

Given their essential nature, it's helpful to slow down and think about the words we use to talk about our partners and volunteers. Consider these common agency sayings and their possible interpretations:

- "Partnerships are the way we get our work done" can easily become, "A good partner is one that does things our way and accomplishes the things we direct them to do";
- "In this day of declining budgets and reduced staffing, we work with partners and volunteers to meet our goals," can mean, "If we could afford to do this any other way we would, but since we can't we'll suck it up and involve others"; and
- "We use partners and volunteers to the fullest extent possible" almost doesn't need translation. Really, who wants to be used?

Thankfully, despite being spoken quite frequently, the intent behind these agency sayings is not anywhere close to the potential translations. Nonetheless, to keep them from resulting in an unintentional culture that hurts our partnership aspirations, we must learn and change quickly. The language used by the Southern Region of the Forest Service and the Southern Appalachian Wilderness Stewards provides a good example of an alternative way to describe partnership that empowers collaboration and respect. The article sections following, written by practitioners in that partnership, offer a way forward.

Southern Appalachian Wilderness Stewards

Launched as a response to concerns from recreation interests to proposed wilderness acres being added to the Cherokee National Forest in Tennessee, SAWS began operations in service to stewardship needs across 22 designated wilderness areas on the Cherokee National Forest, the Chattahoochee-Oconee National Forest in Georgia, the Nantahala and Pisgah National Forests in North Carolina, and the Francis Marion-Sumter National Forests in South Carolina. Since the launch of SAWS, the approach of the organization has been to provide capacity for stewardship activities within wilderness areas. SAWS' purpose is to work with federal land management agency professionals, not to just show up to work on national forest lands. That difference may sound subtle, but it is far from just a play on words.

Work can be produced in a "working on" manner, but that approach leaves opportunities on the table. The idea of just "working on" a forest or in a protected area can still produce positive outcomes, but many times those outcomes fall short of realized potential. For SAWS, the "work with" model is one that goes beyond creating or replacing capacity for the agency. It is not a vehicle to insert different decision makers into processes reserved for those charged with caring for the common good; rather, the "working with" model provides the context of a partnership that considers what the work may be, why the work is proposed, and how the decisions are examined and made.

To work with a partner is to start the relationship from a shared values perspective. Identifying and defining those shared values can uncover unique propositions and can prevent future conflicts or misunderstandings. The model of one partner (agency) defining the work, while another (NGO partner) accomplishes the project misses the opportunity to develop creative solutions and holistic approaches for stewarding resources with a scaled growth of capacity.

"To work with a partner is to start the relationship from a shared values perspective. Identifying and defining those shared values can uncover unique propositions and can prevent future conflicts or misunderstandings."

As a working partnership, now stewarding 45 wilderness areas (the George Washington-Jefferson National Forests in the Virginia were added to the SAWS footprint in 2013), SAWS and the USFS maintain formal and informal lines of communication to consistently define shared expectations and opportunities (Figure 1). Defining shared values requires understanding what wilderness values and interests are priorities for the agency and regional staff, and how those values and areas of focus align with the organizational values of SAWS. It is an ongoing process to define and refine shared interests and a shared vision.

Figure 1 – SAWS and USFS partners working in the field. Photo by Bill Hodge.

For application outside national forest lands, the SAWS approach is to be engaged beyond instances when stewardship needs are scoped. It is to be involved when needs are identified. This is reflected by collaborations to identify restoration or relocation needs associated with recreation impacts. It is more than completing the trail or campsite work but instead being part of designing data dictionaries and understanding how data could be used to mitigate other impacts to wilderness character. These are concrete examples of working with an agency as opposed to just working for the agency. These approaches provide knowledge transfer and allow organizations to grow into new and needed capacity areas beyond trail crews and seasonal positions. As a partner's knowledge base grows, so does the agency's confidence in the partner to bring forward ideas and solutions to issues and challenges within the National Wilderness Preservation System.

Shoulder to Shoulder: Steps Forward with Partnerships

The Wilderness Skills Institute (WSI) is a prime example of a partnership between the US Forest Service, the Southern Appalachian Wilderness Stewards, and Appalachian Trail Conservancy. The WSI is a two-week, intensive training collaborative that is attended by agency employees, volunteers, employees of nonprofit organizations, private business interests, and individuals with a desire to contribute their talents to the preservation and protection of southern US wilderness areas.

Over the course of two weeks, as many as 100 participants develop and hone skills needed to steward wilderness areas. Participants examine what federal wilderness designation means, and the important values associated with wilderness areas. They train to become adept in wilderness first aid, in safe crosscut saw use, trail maintenance and construction, and in best practices for communicating with visitors in a wilderness environment (Figure 2). Some participants develop more advanced skills related to managing visitor use, crosscut saw instruction, or how to prepare a Minimum Requirements Decision Guide within a wilderness decision-making process. These skills and the associated knowledge are then intended to be directed toward on-the-ground stewardship in the future.

Although similar trainings occur in other parts of the country, and across the globe in protected areas, the Wilderness Skills Institute is unique in several ways. The institute's partners have a shared vision of "fostering through skills development an

Figure 2 – Training in traditional crosscut saw use. Photo by Bill Hodge.

Figure 3 – Wilderness Skills Institute participants. Photo by Bill Hodge.

engaged, informed, invested stewardship constituency for wilderness." This shared vision and partnership has allowed the WSI to take on a life of its own and become rooted in the culture of the wilderness community.

Modeled on the Authority of the Resource Technique (ART) (Wallace 1990) of communicating with wilderness visitors, the WSI training is rooted in a sense of shared responsibility for the wilderness resource. There is a strong emphasis on "shoulder to shoulder" planning and learning. Every year the planning team, composed of individuals from all three entities, starts the conversation together on what is to be offered at the WSI. The words *shoulder to shoulder*, used to talk about WSI, are infectious and energizing. The term is used to describe the coming together of equals in a partnership that delivers benefit to all. People brag that when WSI is in session, you can't tell who works for whom, or who is getting a paycheck, and who is volunteering. All are there for the love of the wilderness resource, and all contributions and ideas are valued equally. You hear it in the words they speak to each other (Figure 3).

The results of this training have included stronger relationships among partners, growth opportunities for attendees, skills strengthening within the wilderness workforce, and a strong sense of community in support of the wilderness resource. This model of using ART and the language of working "shoulder to shoulder" to build wilderness partnerships can be replicated. We have a resource to focus on – the wilderness. Utilizing the "shoulder to shoulder" approach to partnership allows us to remain focused on that resource. Through this we can learn, build skills, and improve wilderness stewardship together.

Final Thoughts

The conversation between federal and private conservationists that began in the hills of Tennessee so many years ago is indeed alive and well. For both SAWS and the Forest Service, the conversation and the partnership it engenders is a critical part of the work we do. Neither organization sees or speaks of the other as simply a means to an end. We partner because the individuals who value wilderness and wild places have a fundamental right to participate in their management, and the participation of the people makes wilderness stronger and more resilient. SAWS does not work on national forests. SAWS works with the Forest Service to strengthen the positive impact of both organizations on the land. The Forest Service doesn't use SAWS because it can't get the work done without them. The Forest Service works shoulder to shoulder with SAWS to figure out the best work to do and accomplish it. This language is powerful. It leads to a partnership culture that inspires, empowers, and uplifts. Together and with welcoming arms for others we buttress the future of southern Appalachian wilderness.

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First Steps to Meaningful and Lasting Relationships with Native Peoples

BY GREGORY HANSEN

It is long overdue for managers to begin building stronger working relationships with neighboring Tribal groups. With Native issues such as the appropriate management of and access to cultural and sacred sites within wilderness, strong relationships ultimately move us closer to the common goal of managing protected areas for the use and enjoyment of *all* people! Native peoples are being invited to engage more in wilderness planning and stewardship than previously, and engaging Tribal groups with cultural ties to wilderness is mandated by US federal land managing agencies. However, two questions still remain: Are we truly listening to what they have to say, and are we as wilderness stewards acting on the ancestral knowledge that is being offered from these First Stewards of the land?

Native peoples continue to possess the ability to intimately understand and effectually communicate with the natural world and have many things they can teach us all about respectfully interacting with wild places. Tribal chairman Terry Rambler of the San Carlos Apache Tribe points out: "Many Tribal sacred areas are located on federal lands because these lands were once our ancestral homelands. Tribal connections to these lands have not been extinguished despite changes in title" (Rambler 2013).

With increased interest by Indigenous groups to maintain or reaffirm their connections to cultural sites within designated wilderness, the time has never been better to reach out to Native peoples and include them in all aspects of wildlands stewardship. Federal-government to Tribal-government consultations are likely to increase in wilderness planning processes. Therefore, agency planners must prepare to engage in appropriate methodologies that employ place-based and traditional knowledge that provide for sound, adaptive planning efforts (Watson, Stumpff, and Meidinger 2012).

The purpose of this article is to offer managers and wilderness advocates field-proven first-step methods and techniques for developing successful working relationships with Indigenous communities that can benefit all peoples and wildland resources.

Greg Hansen with Ponca relative at their annual Ponca Homecoming Dance, White Eagle Agency, Oklahoma, United States.

Cross-culturalpartnerships are integral to an all-encompassing wilderness system, and strong collaborations between wilderness managers and Native communities can be achieved and maintained using the following proven partnership development strategies.

It is important to note that these strategies are not an attempt to speak for Native peoples. On the contrary, these proud Nations, Tribes, Bands, and individuals speak for themselves. Instead, these strategies have been developed from the author's lifelong experiences with traditional American Indian relatives from the great Ponca Nation (a southern plains Tribe located in north-central Oklahoma, United States), with his Native Intertribal extended relatives, and via his years of practical experience working with Southern African Tribal communities while serving as the US Forest Service's wilderness training coordinator for Africa.

Understanding Indigenous Cultures

Understanding the group of people one wishes to partner with is a critical first step. Ancestral beliefs and practices, as well as progressive Tribal viewpoints pertaining to protected areas and natural resource management, may differ significantly from that of contemporary viewpoints. By taking the time to better understand a potential partner and how they view wilderness, it is possible to build respectful relations based on common ground and sincerity to collaborate on sensitive issues (Hansen 2007)

The following cultural keys are commonly recognized as being present among American Indian cultures, as well as most other Native groups: values, language, family, humor, and connection to the land. These keys are helpful to managers in understanding how contemporary wilderness fits, or does not fit, into the systematic views of Native cultures worldwide.

Values

If a manager wants to understand a potential Indigenous partner, they should first understand what is important to that group and what their values are. For example, many Native peoples carry less materialistic values than other non-Native cultures. Economic or political gain stemming from activities such as outfitting/guiding or ecotourism in or adjacent to protected areas are viewed very differently from that of mainstream society.

What is important to Native people is their ability to provide for their family, that they are free to live as they please in their historical homelands, and that they are allowed to be spiritual people who can conduct their ceremonies without intrusion or fear of being persecuted for their beliefs and/or ceremonial practices. These values can to a large extent influence decisions and actions made by Tribes during wilderness planning and play an important role in beginning to understand Native cultures.

Language

Language is at the center of any culture. It plays an integral role with many Indigenous groups, as many still rely heavily on oral traditions to pass cultural information down through generations. Examples of how language influences culture include Tribal creation stories, histories, songs, and ceremonies that have been passed down through word-of-mouth communication. How can acknowledging Native languages influence wilderness management? Language can effect protected area decisions made collaboratively with Tribal partners in different ways. For instance, cultural sites are not always publicized or highlighted on maps for the general public. This language-influenced characteristic is not only an attempt by Tribal groups to protect the integrity of such sites, it also occurs because this kind of sensitive information has always been maintained and handed down orally through language-based traditions.

"With increased interest by Indigenous groups to maintain or reaffirm their connections to cultural sites within designated wilderness, the time has never been better to reach out to Native peoples and include them in all aspects of wildlands stewardship."

It may not be realistic to ask managers to learn or study a new language every time they are asked to work with a different Indigenous group. However, since many Tribal stories and ceremonies are place-based within protected areas, taking time to recognize the basic principles of pertinent languages could reveal a particular community's root-ideals relating to caring for wildlands. This can be key information for a manager or an organization wishing to work in partnership with any Native community.

Family

The significance of kinship in Native cultures is helpful in comprehending how Native people interact with one another and with outside groups or individuals such as wilderness managers. Family is one of the most important social and political structures within the Tribal organization. Many Tribes are made up of extended groups of relatives, Bands, or Clans, who in the past traveled and lived together and who still today might live in family clusters on Tribal lands or who maintain family ties across miles. Therefore, understanding how Tribal family structures, such as hereditary leadership, can impact Tribal decision making can lend valuable insight into how best to communicate and work with Indigenous peoples.

Humor

The role of humor in Native cultures is meaningful when attempting to better understand American Indian people as well as other Native groups. Although humor may not be directly related to the physical stewardship of

wilderness, it is important enough to still be considered when working with Indigenous peoples. Significant knowledge directly relating to the management of wild places can be conveyed through humorous remarks and/or circumstances. Native people fully comprehend the fact that life is hard and humor is a means of reducing stress and breaking up the solemn realities of the world around them. Important information on why a certain wilderness decision was made, or how the partnership is progressing may be derived from the briefest humorous words or a seemingly unrelated funny exchange.

Connections to the Land

Fools Crow – one of the most recognized Ceremonial Chiefs of the Teton Sioux shared: "The ancient Native American people lived cooperatively with the land, didn't waste, didn't litter or pollute on the scale that we do today. There was no need for them to have an Earth Day as every day was a day of earth preservation for them" (Mails 1991). For traditional Native peoples, this inherited connection to the land that Fools Crow speaks of lives on and is still very much intact. Yet it is this very adoration for the land that can often create difficult philosophical challenges for Tribal peoples concerning the decisions they make or the actions they propose for protected areas.

For example, the issue of access to cultural sites within designated wilderness illustrates the pertinence of Native peoples' connection to the Earth and how this fundamental cultural element severely impacts how they perceive wilderness. Agency managers are held to the law in allowing access to wilderness only by nonmotorized or nonmechanical means. Tribal groups are requesting access to place-specific sites within wilderness they have used for generations. Since a Tribal group has such strong ties to the land and to that place-specific site because of its cultural significance, this puts them in a highly sensitive position when working with managers who are bound to uphold protected area regulations. It may not be an easy issue to resolve, but certainly one that both managers and Tribal groups are now trying to come to agreement on more than ever before. Understanding the all-encompassing connection that Native peoples still have with the land is absolutely central to gaining a greater sense of how these communities interact with the contemporary concept of wild places.

Native Community Partnership Development

Building Respectful Relationships

Developing quality working relationships with Native peoples takes patience and commitment. First, it is imperative for managers to establish trust with the Native community they are communicating with before any level of cooperative work can be achieved. Once a basic trust and a positive rapport has been attained, and respectful communications are occurring, the manager can begin to develop the rudimentary elements of the partnership with community leaders. General partnership goals should be jointly determined early in an effort to make clear both parties' intentions for the collaboration and to reduce the possibility of unnecessary misunderstandings over the potential long-term relationship. Traditional values, beliefs, and practices should be carefully integrated into the goal setting and overall planning process.

It is recommended that managers meet with Tribal elders or leaders in their own home surroundings. This helps build trust with the community by making Tribal leaders feel more comfortable and open to speak freely. Also, having someone from the Tribal community who knows and trusts the agency/organization representative introduce the manager to community leaders can greatly assist in opening up communications more quickly. This community contact can also serve as a lingual/cultural interpreter if any type of language or strong cultural barriers exist. Starting communications with a community member will aid in building the necessary trust with leaders, something that will be essential to the long-term success of the relationship.

Managers should also accept invitations to visit the Native community, taking every opportunity to attend community activities that are open to the public (e.g., dances, feeds, and celebrations). This may include offers from traditional elders and community leaders to share meals or to speak at Tribal meetings. This sends a positive message that the agency or organization is sincerely interested in learning more about the people and their culture. It can be a positive sign that the manager is beginning to be accepted by the community and can be trusted to keep their word and honor commitments. However, managers should realize that their sincerity and motives could be tested by their ability not to push their ideas or partnership agenda too fast. Pushing too hard or trying to move ahead too quickly to advance a partnership can be strongly frowned on and seen as a typical non-Native self-serving tactic.

Figure 1 – Native Corps member conducting wilderness character monitoring and trail inventory with Mesa Ranger District wilderness ranger.

Tribal Politics

Each Native group can have unique political structure and relationships. It is important for managers early in the process to avoid getting in between community divisions or becoming involved with Tribal politics. In some instances the official governing body of a community may not completely represent the philosophies, beliefs, or wishes of all community members. An example of this is a community that hosts a Tribal Council made up of primarily progressive or contemporary-thinking leaders, as compared to a more traditionally oriented governing body. Managers and planners should devote time to investigating which leaders legally and traditionally speak for the entire community, and again avoid getting involved in cultural divisions or Tribal political groups.

While some community members might open up to the agency representative quicker than others, some members may never be completely comfortable with a particular collaboration or effort. Therefore, managers need to be open to receptive and approachable leaders while not purposely avoiding individuals who are resistant. They must try and work with the leaders who best represent the entire community and who are willing to develop a strong, positive partnership.

Developing a Partnership Work Plan

After partnership goals and objectives have been agreed on, one of the final first steps is to create a partnership work plan. Development of an organized, attainable, collaborative work plan is a significant action toward sustaining meaningful and lasting relationships with Native peoples. All work plan components must balance the cultural elements of the Tribal group and management objectives of the affiliated agency or organizations (Figure 1). A work plan should include partnership goals and objectives, individual on-the-ground work action items, time frames for completing action items, parties responsible for implementing the work, a plan for regular meetings between parties, and a budget. These work plans should be incorporated into formal memorandums of understanding, memorandums of agreement, or cooperative agreements signed by both partners. It is recommended that both Tribal representatives and agency representatives have the authority to sign and fulfill agreements. The efforts given to creating a strong work plan give the best opportunity for positive outcomes from the partnership and collaboration.

Conclusion

Executive director of the Northern Arapahoe/Shoshone Wind River Indian Community's Environmental Quality Commission, Don Aragon, states: "The World Wilderness Congress has always operated on the principle that Indigenous knowledge and perspectives must be included in any wilderness discussion to ensure a full understanding of the wilderness concept" (Aragon 2007). The World Wilderness Congress has therefore formally recognized that Indigenous peoples instinctively and through their own methodologies understand our natural world and must be included in the overall planning and stewardship of protected areas.

Recently, on October 15, 2015, more than two dozen Tribes formally requested President Barack Obama to declare the 1.9 million acre (approx. 809,000 ha) Bears Ears sacred site (between Utah and Arizona, United States) as a national monument. Under a unique plan involving nation-to-nation collaboration, it may be the first truly collaborative land management effort between Native Americans and the US federal government (Indian Country Today 2015). The Sierra Club and other prominent nongovernment organizations have pledged their support to the Bears Ears movement, setting a high bar for further environmental collaboration between the US federal government and Native peoples (Figure 2).

Continued on page 40

Figure 2 – Trail maintenance and reconstruction in the Superstition Wilderness by Native Corps members.

Clifty Wilderness Campsites and Rock-Shelters

Long-Term Comparative Analysis, Challenges, and Opportunities

BY RYAN L. SHARP, JUSTIN D. KURTZ, and JAMES N. MAPLES

Abstract: Campsite impacts can take away from the unique qualities that wilderness provides, and monitoring these impacts is an important component of protected area management. In this study, we collected data on campsites and rock-shelters in the Clifty Wilderness Area in the Daniel Boone National Forest. Impact parameters included number of sites, site size, tree damage, and overall condition. These parameters were then compared with 2007 data collected by Daniel Boone National Forest staff. Compared to 2007, an additional 96 campsites were found, but 64 fewer rock-shelters. Overall site impacts (such as average total area per site and condition class) indicated a mix of improvements at some sites and increased impact at others. This study further underscores the need for long-term monitoring of recreational impacts in wilderness while being mindful of the difficulty in measuring impacts across time.

Introduction

Human activity can negatively impact wilderness areas. Camping in particular can have marked impact on protected areas (Cole 2013). Campsite impact occurs both locally and collectively across wilderness areas (Cole, Foti, and Brown 2008). Contributing factors to campsite impact include human factors (e.g., frequency of use and user behaviors), ecological durability, management action, and spatial factors such as distribution of parking areas and trail networks (Cole 2004). Wilderness managers are concerned with these impacts as they balance the dichotomy of preserving the wilderness as a finite resource while allowing legally mandated opportunities such as the pursuit of solitude and unconfined recreation (US Public Law 88-577). Fortunately, management frameworks provide land managers guidance for managing impacts and inform management actions that balance preservation and use.

One such framework utilized by the USDA Forest Service is Limits of Acceptable Change (LAC). According to Stankey, Cole, Lucas, Peterson, and Frissell:

> The LAC process consists of four major components: (1) the specification of acceptable and achievable resource and social conditions, defined by a series of measurable parameters; (2) an analysis of the relationship between existing conditions and those judged acceptable; (3) identification of management actions necessary to achieve these conditions; and (4) a program of monitoring and evaluation of management effectiveness. These four components are broken down into nine steps to facilitate application. (1985)

Ryan L. Sharp. Photo by Julie Sharp.

Justin D. Kurtz. Photo by Julia Kurtz.

James N. Maples.

In 2007, the Daniel Boone National Forest (DBNF) initiated components one and two of the LAC planning process (US Forest Service n.d.). This included using the Global Positioning System (GPS) to measure campsite and

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rock-shelter locations and conditions within the Clifty Wilderness Area (CWA) of the DBNF. After this initial data collection, DBNF managers began to implement component three of the LAC process, specifically identifying actions designed to reduce the proliferation of user-created campsites and overuse of sensitive rock-shelters (e.g., education at trailheads, site closures, trail closures related to sites).

In the summer of 2014, we conducted a study of ecological conditions related to recreational camping in the CWA to address component four of the LAC, monitoring and evaluating management effectiveness. This study replicated the 2007 study completed by DBNF staff. Replicating studies that monitor long-term visitor impacts of wilderness are essential to the social and environmental well-being of the areas (Loomis 2000), but are rarely found in the literature. The primary purpose of this article is to examine the differences between the two data collections periods in relationship to wilderness management. Specifically, it addresses the challenges associated with replicating data collection and the barriers to reliable and consistent monitoring of wilderness resources.

Description of the Study Area

The CWA is located in the DBNF within the eastern half of Kentucky, United States. Designated in 1985, it encompasses 5,006 ha (12,370 acres) and is managed by the US Forest Service (Wilderness.net, n.d.). The CWA is composed of a mixed mesosophytic forest characterized by hemlocks, hardwoods, and rhododendron thickets. The area is also known for its rugged, steep cliffs, sandstone arches, and rock-shelters. Popular outdoor recreation activities include hiking, backpacking, camping, and rock climbing.

Due to its close proximity to large urban centers, the DBNF's forest and wilderness areas receive a high level of use from visitors. The city of Lexington, Kentucky (population 310,000), is approximately an hour away (111 km/69 miles), and the cities of Louisville, Kentucky (population 610,000), and Cincinnati, Ohio (population 300,000), are both approximately two hours away (233 km/145 miles). These short distances make CWA very attractive for both day use and weekend camping. Additionally, the CWA is easily accessible. Its western border is the main road that travels through the DBNF, providing visitors easy access to recreation sites from their parked cars.

Methods

We collected data for both campsites (Figure 1) and rock-shelters (defined here as cave-like recesses of sufficient size to allow camping) (Figure 2) with a Trimble GPS receiver during the months of July and August 2014. Campsites and rock-shelters were located by walking all of the formal and informal trails in the study area. This was made possible because of the relatively clear boundaries of the wilderness area (several campsites were removed from the analysis because it was revealed on examination in GIS that they were outside of the boundaries). Rock-shelters were defined as areas of at least 6 feet (1.83 m) in height and had sufficient overhang as to not receive rain on a regular basis. Campsites were identified by any level of disturbance to the surrounding area (e.g., trampling, compaction, fire rings, trash, etc.). We replicated data collection protocols used in the 2007 study, using the original instructions developed by Marion (1991) and modified in collaboration with DBNF managers (*Campsite Census Manual* 2005). Measurements taken included presence of tree damage (e.g., number of tree stumps in the area impacted and tree/shrub damage related to recreational use [not the result of natural forces] ranging from none to severe), and presence of graffiti based on a 0–5 scale (0 = no graffiti present to 5 = more than 50 square feet [4.65 sq. m] are covered). Graffiti was defined as being carved, painted, chalked, or charcoal. The length and width of the impact area was also measured using the geometric figure method (i.e., rectangle), which provides a rapid and accurate measurement when paired with good judgment (Marion 1991). Campsites were also individually rated for condition class from 0–5 (0 = campsite barely distinguishable and 5 = soil erosion is obvious, as indicated by exposed tree roots and rocks and/or gullying). Data were loaded postcollection into ArcGIS 10.2 and plotted onto a CWA layer within the program.

Basic descriptive statistics and frequencies were utilized to explore the differences between the two data collection periods. The purpose of this analysis was not meant to determine a statistically significant difference, as this was of less value to the wilderness area managers. Instead, the intent of the analysis was to document results for comparison that could provide discussion points and highlight the challenges and merits associated with the replication of monitoring protocols.

Limitations

The researchers made every effort to duplicate the protocols from the 2007 study and document every

campsite and rock-shelter in the study area. However, the 2007 data collection was part of the forest's LAC planning effort that included funding for several employees and researchers for data collection. The 2014 follow-up study did not have the same staffing or financial support. During an initial pilot of the 2014 data collection, it became apparent, within the financial and time constraints for this research, that attempting to relocate every rock-shelter and campsite from the 2007 data collection period would not be feasible, particularly with need to also document new campsites. This challenge was mainly due to the poor GPS reception in many parts of the CWA and the intense clustering of sites in many popular areas. Additionally, many campsites and social trails leading to previously inventoried campsites may have recovered to the point of being undetectable by the researchers. Finally, although the 2007 and 2014 data collection events used identical protocols, the subjective nature of many of the measurement parameters could have influenced the results. For example, many rock-shelters that were inventoried in 2007 were not in 2014 because on inspection it was determined that they did not meet the 6 foot (1.83 m) height minimum of the 2007 protocol.

Table 1 – Comparison of campsite impacts between 2007 and 2014 in the Clifty Wilderness

	Year	
Measurement Variable	**2007**	**2014**
Number of campsites	222	318
Average length	43.3ft (13.2m)	47.4ft (14.4m)
Average width	24.2ft (7.4m)	29.0ft (8.8m)
Average number of damaged trees	5	7.5
Average number of undamaged trees	4.2	1.9
Average number of stumps	2.6	3.7
Number of campsites ≥ conditions class 3	102	156
Number of campsites ≥ condition class 4	55	93
Highly impacted campsites ≥ condition class 4 (in %)	25	29

Results

Campsite Analysis

Table 1 includes comparative descriptive statistics for campsites measured in 2007 and 2014. A total of 318 campsites were located and measured in 2014, compared to 222 campsites in 2007. The average size for a campsite in 2014 was 1374.6 ft^2 (419.0 m^2), compared to 1047.8 ft^2 (319.3 m^2) in 2007. This marks a 31% increase in average size of impact area for campsites within the CWA since 2007.

Campsites in 2014 also indicate an increase in human impact, as measured by condition class. The mean for condition class for 2014 was 2.23 out of 5. This was a slight increase in comparison to the mean of 2.21 in 2007. This change may be in the difference in percentage of highly impacted campsites (designated by a condition class of 4 or higher)

Figure 1 – Example of a campsite in the Clifty Wilderness. Photo by Justin Kurtz.

Figure 2 – Example of a rock-shelter in the Clifty Wilderness. Photo by Ryan Sharp.

between the two studies. Highly impacted campsites made up 25% of the total campsites in 2007. In 2014, 29% of campsites were rated at a condition class of 4 or higher. This relationship remains true for a condition class of 3 or higher with 46% in 2007 and 49% in 2014. Other measurements taken also revealed a trend of increased impact. In 2007, campsites had an average of five damaged trees. In 2014, the number of average damaged trees increased to 7.5. The number of tree stumps also increased by 42% from 2.6 stumps to 3.7 tree stumps per campsite.

Rock-Shelter Analysis

Table 2 includes comparative descriptive statistics for rock-shelters measured in 2007 and 2014. Researchers discovered only 70 rock-shelters in 2014, which is notably different from the 134 located in 2007. It is conjecture, but social trails leading to the many of the rock-shelters discovered in 2007 may now be unnoticeable in 2014 due to lack of use, leading to areas with groups of rock-shelters not being explored. As previously noted, the 6 foot (1.83 m) height minimum to define a rock-shelter was also more strictly observed in 2014, potentially leading to a decrease in numbers. Other measures indicate slight changes between 2007 and 2014. The average number of damaged trees in the area immediately surrounding a rock-shelter was 0.4. In 2014, that number increased to 0.6 damaged trees. The average number of stumps and the average number of nondamaged trees varied slightly at 0.2 and 0.5 respectively from 2007 to 2014. Graffiti of any kind was present in 20% of the rock-shelters found in 2007. In 2014, 15% of rock-shelters located had graffiti present.

GIS Spatial Analysis

We used GIS software ArcMap 10.2 to further compare findings from both studies. This software was especially helpful in identifying and comparing impact to specific locales within the CWA. The results were a mix of improvement and decline. For example, one popular hiking area revealed improvement for campsite impacts based on condition class even as the mean condition grew worse. In 2007, six campsites were located in this area, five of which were classified as a condition class 3 or greater. In this same area in 2014 only three campsites were discovered and none had a higher condition class greater than 1. Conversely, another area (upper Osborne Trail) with limited camping impact in 2007 saw a marked increase in 2014 (see Figure 3). Researchers in 2007 found 24 campsites along this stretch of official Forest Service trail. In 2014, researchers located 74 campsites in this same area along this trail. It is noteworthy that the majority of the campsites in this area were classified as a condition class less than 3 (n = 51) in 2014. This may be an indicator of the new creation or light use of these campsites. It is also possible that these campsites existed in 2007 but were overlooked by researchers because of their minimal impact.

We also found interesting possible trends for the popular informal trail in the area. In 2007, there were 21 campsites in this area with a condition class of 4 or greater. Researchers discovered 19 campsites classified as a condition class of 4 or greater in 2014. However, examination of the GIS data revealed that campsites along this trail could be divided into two distinct areas: lower and upper. In 2007, the highest concentration (n = 15) of highly impacted sites fell within the lower section of the trail. However, in 2014 only 5 sites remained highly impacted in this lower section. Interestingly, the reverse is true for the upper portion of the trail. In 2007, only 6 highly impacted sites appear in the upper portion of this social trail, but 14 highly impacted campsites are present in 2014. This could possibly be the result of visitors seeking out a more wilderness-like experience by getting farther away from the road.

Table 2 – Comparison of rock-shelter impacts between 2007 and 2014 in the Clifty Wilderness

	Year	
Measurement Variable	**2007**	**2014**
Number of rock-shelters	134	70
Average number of damaged trees	0.4	0.6
Average number of undamaged trees	0.5	0.5
Average number of stumps	0.2	0.2
Percent of rock-shelters condition class ≥3	35	21

Conclusions and Implications for Management

Wilderness and the benefits derived from it may become more and more important as recreationist begin to further realize what a limited and sensitive resource it really is (Watson, Cordell, Manning, and Martin 2015). This realization may lead to more people wanting to experience

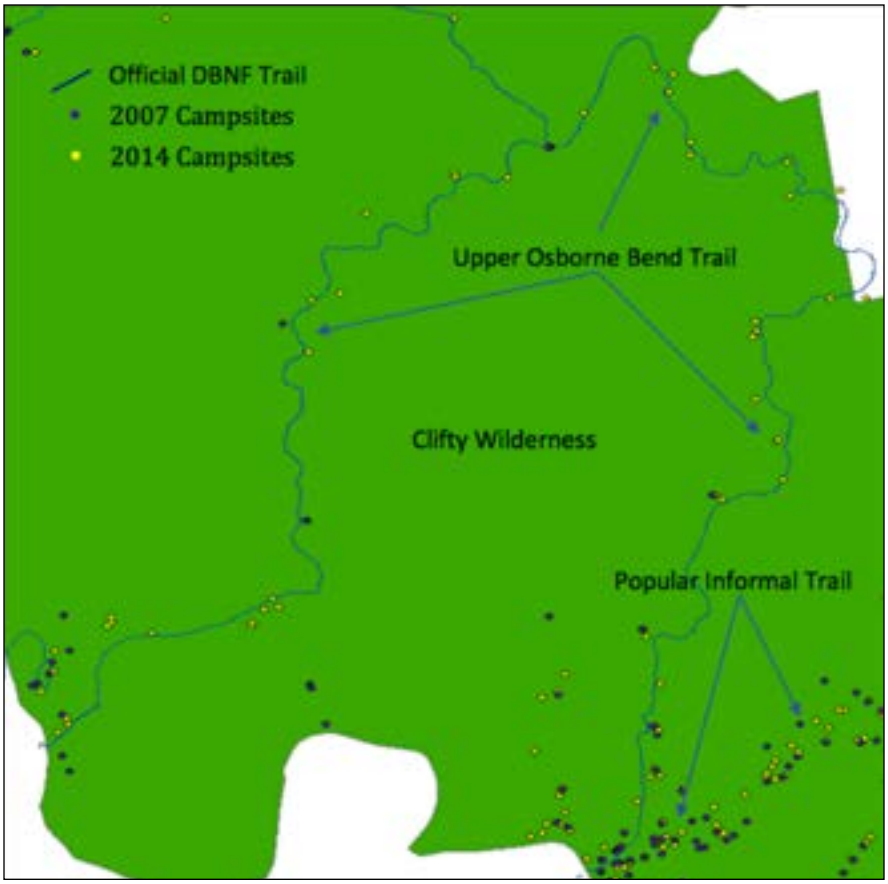

Figure 3 – Trail campsites comparison between 2007 and 2014.

it for themselves, which can lead to issues of crowding and overuse. The management of wilderness areas such as CWA will always be a challenge because of its proximity to large numbers of people. Therefore, a strong case can be made for increased monitoring efforts to help reduce the potential negative impacts of activities such as camping and identify areas of concern, although this is not easily accomplished.

This comparative study has highlighted the difficulty in doing such an analysis. Some basic conclusions can be made, such as the proliferation of campsites in some areas compared to 2007 (see Figure 3), and overall impacts appear to be relatively stable (based on 0–5 impact scale focused on condition class). However, the increase in the number of campsites and the fewer number of rock-shelters inventoried may be due to visitor use *or* the method of data collection. Also, the DBNF managers have done a considerable amount of work to close campsites/rock-shelters and rehabilitate others in hopes of reducing the overall impacts of use. However, we inventoried almost 100 more campsites in 2014, thus showing that use has possibly increased, use has shifted, or visitors are seeking out more pristine camping sites. Camping near water remains popular, but the proliferation of campsites in certain areas should be reason for concern.

Although past studies have been able to identify and relocate sites from one period of time to another (see Reid and Marion 2004 and Twardock, Monz, Smith, and Colt 2010), these are rare and often conducted by experts in recreation ecology. This means that those with greater expertise and training are often the only ones able to conduct repeated measures of campsite impacts (especially on a large scale such as this study). Although there has been a call for more in-depth and sophisticated methods of understanding recreational impacts such as camping on natural resources (Monz, Cole, Leung, and Marion 2010), maybe simpler is the better road forward. This is not to say that the work done by many researchers to understand the complexities of recreational impacts in wilderness areas is not worthwhile, or should be discontinued. Rather, perhaps there is a way to provide rapid assessments that can be conducted with little technical equipment and little technical expertise that will allow wilderness managers to monitor impacts over time. Would it be better to have some idea of impacts to campsites over time through a rapid assessment, or no data at all? This is the debate we wish to raise and further with this study.

We attempted to replicate a study done seven years previous using the same protocol, not a substantial amount of time given research time lines. Due to very limited funding and time, we were unable to individually identify and catalog the close to 350 campsites and rock-shelters identified in the first round of data collection. This is not an uncommon barrier to conducting repeated measures over time. Most wilderness areas are already working on shoestring budgets and rarely have the funding to collect baseline data, let alone long-term monitoring. The amount of effort needed to do the research is also a significant barrier. Two researchers spent two months collecting the data in 2014 to catalog 318 campsites and 70 rock-shelters in a relatively small wilderness – 12,371 acres (5,006 ha). This amount of

time is hard to come by for wilderness managers. Does the data collected in this study help wilderness managers make decisions? Does the subjective nature of the methods yield confusing and possibly counterproductive data? Were there really more than 90 campsites created from 2007 to 2014, or was the perception of what a campsite looked like different between those who were doing the inventories? These are all valid questions that need to be taken into consideration. However, this information is still useful in identifying impacts and documenting impact trends in a wilderness area.

Wilderness managers will always be working to maintain the integrity of natural resources through different techniques. Monitoring impacts over time, even in a rapid assessment format, and taking into consideration the limitations discussed previously, can yield insight into how effective certain management actions are. The results of this study show that there are more campsites seven years later, which could mean an increase in use, or perhaps a change in camper behavior. There were more damaged trees and a higher number of stumps, possibly pointing to a more intense level of use. There was an increase in the number of highly impacted sites. These descriptive trends may point to the need for more intensive management, or that certain attempted management actions may need to be reworked, better understood, or abandoned altogether. Consistent monitoring of conditions related to recreational use is critical to maintaining wilderness character, and is worthwhile even in the face of methodological difficulty. Managers may consider choosing several test sites within the CWA and conducting repeated measures testing in conjunction with specific management actions (e.g., closing campsites) to see if a rapid assessment can provide useful information for maintaining wilderness qualities. There is not a substitute for in-depth, one-to-one repeated measures of use impacts in wilderness areas. However, if a more rapid assessment yields useful information for managers, this may be a more cost-effective and time-efficient way to monitor impacts over time.

Acknowledgments

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PERSPECTIVES FROM THE ALDO LEOPOLD WILDERNESS RESEARCH INSTITUTE

Wilderness for Science

How Protected Areas Help Scientists Better Understand Fire Regimes

BY SEAN A. PARKS

The Aldo Leopold Wilderness Research Institute (ALWRI) conducts science under three central themes: (1) science for wilderness, (2) wilderness for landscape sustainability, and (3) wilderness for science. *Science for wilderness* emphasizes that our work informs effective stewardship and management of wilderness. *Wilderness for landscape sustainability* aims to improve understanding of the roles of protected lands in maintaining the ecological, economic, and social integrity of larger landscapes. *Wilderness for science* recognizes that wilderness can serve as a laboratory and benchmark to understand the causes and consequences of environmental change in areas minimally confounded by human influences. The focus of this article is the last theme with a twist: wilderness for *fire science* (see Miller and Aplet 2015). ALWRI scientists partner with many organizations to conduct research on this theme, including The Wilderness Society, Canadian Forest Service, Joint Fire Science Program, University of Montana, Northern Rockies Fire Science Network, University of Idaho, and University of Massachusetts.

Wildland fire activity has been substantially reduced in many regions of the world due to human activities and infrastructure such as logging, roads, fire suppression, and altered land use. However, in the United States and elsewhere in the world, wildland fire was historically a natural ecological process that cycled nutrients, maintained landscape resilience, and provided suitable habitat for myriad species. In fact, many species in fire-prone landscapes evolved adaptive traits to cope with fire. Consequently, there is growing recognition that fire is not always "bad" or "catastrophic," and in some regions of the world, that fire should be allowed to occur or should even be reintroduced. There is an urgent need to better understand fire regimes, and the best place to study the causes and consequences of fire in the absence of human-induced confounding factors is wilderness. That is where wilderness for fire science plays a role.

Sean Parks.

To better understand how the biophysical environment and fire exclusion influences fire regime characteristics in landscapes with low human influence, several scientific studies have been conducted within protected areas. Findings suggest that topography and vegetation plays a major role in influencing fire severity (Thompson et al. 2007; Kane et al. 2015) and that some wilderness landscapes in the western United States are more likely to be resilient to reintroduced fire because of the absence of previous logging (e.g., Larson et al. 2013). These unlogged wilderness landscapes can also provide valuable information on fire-induced tree mortality (Belote et al. 2015) and on historical fire interval, forest structure, and forest composition (Barth et al. 2015).

In protected areas that have allowed fire to play a more natural role (for example, the Selway-Bitterroot Wilderness and Aldo Leopold Wilderness in the United States), a natural experiment is unfolding that is allowing scientists to better understand the role of past fires in influencing subsequent fire behavior, size, and occurrence. Scientists are using observed fire patterns to evaluate the effectiveness and longevity of wildland fire to act as a fuel treatment and evaluate factors that maintain or increase resilience to future fire events. Collectively, these studies have

concluded that previous fire does limit the occurrence, size, and severity of subsequent fire, but that the strength and longevity of this effect varies depending on the productivity and fire regime characteristics of each region (e.g., Collins et al. 2009; Parks et al. 2016). These studies also concluded that previous fire is less effective at regulating subsequent fire characteristics under extreme weather conditions (Parks et al. 2015). These studies complement and expand on previous studies that used simulation models to look at similar questions (e.g., Davis et al. 2010).

On a more regional level, recent studies conducted within the United States and internationally have shown that fire activity and climate are tightly linked in protected areas, but that this relationship weakens, or decouples, as landscapes become more human influenced (Archibald et al. 2010; Parks et al. 2014). As such, protected areas serve as a valuable benchmark that provides insight as to how fire naturally responds to climate and has allowed scientists to quantify how much fire "should" be expected within various climate domains. In fact, this reasoning has helped scientists identify where there has been more or less fire than the climate would dictate, not just within protected areas, but covering the western United States irrespective of protected area status (Parks et al. 2015). Evaluations of the relationship between fire and climate in protected areas may also provide insight into how climate change will influence fire regime characteristics.

"There is an urgent need to better understand fire regimes, and the best place to study the causes and consequences of fire in the absence of human-induced confounding factors is wilderness."

The findings of these and other studies conducted within protected areas have relevance far beyond protected areas and are applicable to lands of all management designations. That is why this research is considered *wilderness for science*. However, it should not be underemphasized that such studies are also highly relevant to wilderness stewardship and management, and may also be couched as *science for wilderness*.

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Fifty Years of Science Supports Wilderness Stewardship

Findings of the Aldo Leopold Wilderness Research Institute and Cooperators

BY SUSAN FOX

Planning was in high gear in 2013 as the wilderness community prepared for a wide variety of events to celebrate the 50th anniversary of the Wilderness Act. The most important event was the National Wilderness Conference held in October in New Mexico. The centerpiece of this conference was the signing of a new strategic plan, *2020 Vision: Interagency Stewardship Priorities for America's National Wilderness Preservation System*, by the heads of all the US wilderness land management agencies. Since the signing of *2020 Vision,* the agencies have been hard at work developing an implementation strategy and performance measures that will ensure goals are met. Science is a critical component of *2020 Vision*.

The wilderness science community is contributing to the strategic and implementation planning through a number of steps: (1) identifying the information, science, and training needs of managers (Dawson et al. 2016); (2) developing peer-reviewed papers on the *summarizing what we have learned about wilderness science*; and (3) completing a science plan that identifies the highest priority research needed by stewards of the National Wilderness Preservation System (NWPS). The decision was made to provide a *state of wilderness science* by publishing a series of articles in two journals. The first series of science summary papers was published in *International Journal of Wilderness* in August 2014 in time for the 50th anniversary. The second series were published in a special issue of the *Journal of Forestry* (*JoF*) dedicated to wilderness science. The *JoF* was chosen because it is the most widely circulated scholarly forestry journal in the world, with more 12,000 printed copies distributed and available online to thousands of others via institutional, agency, and business subscriptions. In print since 1902, the mission of the *JoF* is to advance the profession of forestry by keeping forest management professionals informed about significant developments and ideas in the many facets of forestry. Wilderness in the United States encompasses many more land-cover types than just forests – deserts, grasslands, tundra, rocky mountainscapes – and *JoF* was chosen because of its excellent reputation as a high-quality publication and its broad distribution.

Figure 1 – Example cover of the *Journal of Forestry*.

This issue of *JoF*, simply titled *Wilderness Science*, was published in March 2016. It includes 14 papers and 2 case studies by 55 authors. First is an overview of the NWPS to educate readers that may not be familiar with the federal wilderness system in the United States. It is followed by an important paper discussing the challenges facing wilderness management agencies and the managers of these lands with potential solutions offered. The third paper begins the science focus, providing a review of the evolution of wilderness research, identifying the challenges of integrating wilderness science and stewardship, considering catalysts for increasing the science conducted, and ending with a compelling argument for the development of a cohesive wilderness science strategy to address NWPS management needs.

Continued on page 31

Personal Locator Beacons

Influences on Wilderness Visitor Behavior

BY STEVEN R. MARTIN and JESSICA L. BLACKWELL

Abstract: As Personal Locator Beacons (PLBs) become more common, more people may bring them into the wilderness, potentially influencing visitors' decision making and behavior due to a perceived increase in safety. By way of a wilderness visitor survey in Sequoia-Kings Canyon Wilderness (n = 635) and follow-up personal phone interviews (n = 65), we examined how PLBs may influence wilderness visitors. Our results suggest a possible increase in both solo travel and cross-country (trailless) travel in wilderness by PLB users. This has the potential to increase search and rescue (SAR) events, and lead to increased resource and social impacts in trailless areas that are currently pristine or near pristine. Understanding how handheld information and communication technology influences the behaviors and decision making of wilderness visitors is important for managing wilderness SAR operations, managing wilderness resource conditions, developing visitor management guidelines, and educating visitors in appropriate use of technology in the wilderness.

Introduction

Our society is experiencing a technological revolution in the use of handheld information and communication technology. The recent advances in wireless technology have made information and communication devices more portable, more affordable, and more ubiquitous than ever before. Devices such as cell phones, satellite phones, Personal Locator Beacons, GPS units, and smartphones have created unprecedented access to information and communication systems. These devices have been integrated into our lives and have influenced on a daily basis the types of experiences we now have. They have also had a significant influence on how we interact with each other and our environment. Wireless systems let people use these technologies in places they could not have previously, including the wilderness. "Mobile technologies are becoming commonplace in the wilderness, and their presence is altering our relationship to natural environments, our experience of being in the wilderness, and, in some cases, the wilderness landscape itself" (Wiley 2005, p. 5). Our article addresses two important questions we should ask about the use of these emerging technologies in wilderness: How might the use of such technology influence visitor behavior (Martin and Pope 2012), and how might wilderness experiences be affected (Freimund and Borrie 1997)?

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The spread of satellite-driven mobile technologies into remote areas of wilderness is significant because, for many people, wilderness is described or defined as an area absent of human technological influence (Dawson and Hendee 2009; Roggenbuck 2004; Wuerthner 1985). Wiley (2005, p. 6) identified several areas of "tension and conflict" related to technology and wilderness, including "risk versus security, solitude versus connectivity, [and] mediation versus direct experience." Mobile technologies such as satellite phones and Personal Locator Beacons (PLBs) may provide security, but they may also alter the perception of risk, warping one's view of the wilderness and potentially leading to increased search and rescue incidents. Mobile communication devices can provide connectivity to others outside

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the wilderness, drastically altering the solitude element of a wilderness experience. Information and communication technology can alter one's direct wilderness experience by acting as a mediating force; in other words, rather than experiencing and interacting with the wilderness directly, one may interact with and experience the wilderness partly through a digital interface – the technology mediates the experience.

The tensions of risk versus security and solitude versus connectivity may be the most prevalent concerns for how information and communication technology may influence the wilderness experience, specifically with regard to visitor decision-making and risk-taking behavior. This is because communication technology can influence perceptions of safety in the wilderness. Communication technologies in particular have the ability to make people feel more connected, even when they are in solitude, and more secure, even in an unfamiliar or risky environment, becoming "less dependent on their own ability and awareness as they become more dependent on technology" (Borrie 2000, p. 1).

Information and communication technology is one of the most noticeable social factors negatively impacting the wilderness experience in the opinion of California wilderness managers, who felt that technological devices may decrease "self-sufficiency, risk, solitude, and remoteness, many of the characteristics that – to them – define wilderness" (Steiner 2012, p. 9).

Technology thought to reduce the risks associated with wilderness recreation may have significant consequences for the visitor's ability to make appropriate decisions. There is "potential for underprepared and/or overly confident users to substitute technology for common sense, experience and skill, and to make decisions based on unrealistic perceptions of both risk and the ease and availability of rescue" (Martin and Pope 2012, p. 120).

Figure 1 – Examples of Personal Locator Beacons. Photos courtesy of www.Coastalboating.net.

In a 2009 study, overnight visitors to the King Range Wilderness in California were asked a series of questions about their perceptions of technology's influence on safety in the wilderness. Most respondents reported that they would not be likely to take chances that could increase risks because they had technology with them. But there was a group of "pro-technology" visitors who felt that technology increased their safety in the wilderness, identified themselves as significantly greater risk takers who would be more likely to take chances that increased risk if they had technology with them, and would be more likely to use technology to request rescue (Pope and Martin 2011).

Methods

Wilderness visitor survey data were collected in summer and fall of 2011 for Sequoia–Kings Canyon (SEKI) National Parks (Watson et al. 2015). The sample population consisted of adult overnight recreation visitors to the SEKI Wilderness from May 22, 2011 through September 30, 2011. Surveys (with prepaid return envelopes), reminder postcards, and replacement surveys were mailed to a systematic sample of 1,043 visitors who were issued wilderness permits. Respondents could return the survey by mail, or complete the survey online (SurveyMonkey). The survey included questions regarding visitor use of, and beliefs about, handheld information and communication technology, and its possible effects on decision making.

In addition to the written survey, respondents were asked if they would be willing to participate in follow-

Table 1 – Characteristics of survey and interview respondents

	Survey n = 635	Interview n = 65
Age (median)	50	52
% Male	83%	82%
% White	91%	95%
% Completing four-year degree	87%	88%
% California resident	80%	73%
# of previous visits to SEKI wilderness (median)	5	10
% on first visit to SEKI wilderness	10%	12%
Group size (mean/median/mode)	2.8/2/2	2.1/2/1
% who traveled solo on queried trip	23%	37%
# of nights spent on queried trip (mean/median/mode)	4.5/4/2	4.5/4/2
% who hiked off-trail on queried trip	42%	48%
% who camped in trailless area on queried trip	26%	38%

up interviews regarding the use of technology in wilderness, and if so, to provide an email address where they could be reached to schedule an interview. Respondents who indicated their willingness to participate in a follow-up interview (n = 391) were categorized into two strata: those who had carried a Personal Locator Beacon (PLB) on their trip (Figure 1), and those who had not. Interview participants were then randomly chosen from each of the two strata. A total of 65 people were interviewed, 33 of whom carried a PLB, and 32 who did not. Interviews were digitally recorded, transcribed, and responses coded into relevant thematic categories by the interviewer.

Results

Survey Sample

We received 635 completed and valid surveys, for a response rate of 61%. Key characteristics of the survey respondents are summarized in Table 1. Additionally, 76% had visited six or more other wilderness areas in their lifetime, and 35% had visited a wilderness area more than five times in the past year. Of those who camped in a trailless area, the mean number of nights camped there was 2.6. Smartphones were the most commonly carried type of handheld communication and information technology (29%), followed by GPS (26%); 15% carried a PLB (Table 2).

Table 2 – Handheld information and communication technology carried by SEKI Wilderness visitors in 2011 (n = 635)

Device	n	Percent
Smartphone	184	29%
GPS	162	26%
iPod, iTouch, Kindle	124	20%
Cell phone	122	19%
Personal locator beacon	94	15%
Satellite phone	18	3%
Other*	47	7%
None	185	29%

*cameras, altimeters, solar chargers, etc.

Table 3 compares responses of PLB users and nonusers to statements relating to technology in wilderness (defined in the survey as cell and satellite phones, PLBs, and GPS). PLB users were more likely to agree that technology creates a genuine sense of safety in wilderness and felt safer having technology with them, than did non-PLB visitors. Both groups disagreed that they would be more likely to take risks because they had technology with them, that technology reduces wilderness dangers, and that technology can substitute for

Table 3 – SEKI wilderness visitor beliefs about technology* in wilderness; comparison of groups who did and did not carry PLBs (n = 635)

		n	Mean	Standard deviation	95% Confidence interval		Mann-Whitney sig.
					Upper	Lower	
Technology creates a genuine sense of safety for wilderness visitors.	Non-PLB PLB	525 93	3.6 4.2	1.69 1.72	3.46 3.86	3.75 4.57	.001
I would feel safer by having technology with me on a wilderness trip.	Non-PLB PLB	528 93	3.7 4.9	1.82 1.69	3.50 4.56	3.81 5.25	.001
I would be more likely to take chances that could increase risk if I had technology with me in the wilderness.	Non-PLB PLB	528 93	2.6 2.3	1.75 1.60	2.47 1.98	2.77 2.64	.141
Technology creates a false increase in safety for wilderness users.	Non-PLB PLB	525 92	5.1 4.8	1.62 1.65	4.97 4.44	5.25 5.12	.071
Technology in the wilderness makes people feel that their safety is not their personal responsibility.	Non-PLB PLB	523 93	4.4 4.1	1.76 1.84	4.25 3.69	4.59 4.44	.105
Technology in the wilderness can successfully substitute for skill/experience/knowledge.	Non-PLB PLB	528 92	2.0 1.6	1.56 1.18	1.84 1.40	2.11 1.89	.144
Technology reduces many of the dangers people associate with being in the wilderness.	Non-PLB PLB	525 93	2.7 2.7	1.67 1.60	2.55 2.34	2.84 3.00	.987

Scale of 1–7 with 1 = strongly disagree, 4 = neutral, 7 = strongly agree.
*Technology was defined in the survey as cell and sat. phones, PLBS, and GPS.

skills, experience, or knowledge. The statements that respondents were most likely to agree with were that "technology creates a false increase in safety for wilderness users" (non-PLB users mean = 5.1, PLB users mean = 4.8, on a 7-point scale); and PLB users agreeing that they would feel safer by having technology with them on a wilderness trip (mean = 4.9).

Interview Sample

Table 1 summarizes characteristics of the interview participants, who were similar to the survey respondents except that they had visited the SEKI Wilderness more often, were somewhat more likely to have traveled solo, and were somewhat more likely to have camped overnight in a trailless area.

Among those who traveled with a PLB (n = 33), reasons for doing so were categorized as follows: 20 gave reasons pertaining to safety, "insurance," backup, or in case of emergency; 15 gave reasons related to communication with family and/or to provide peace of mind to family members by alleviating loved ones' concerns while on a wilderness trip. Six people said it was a way to justify solo travel, alleviating concerns for both the individual traveling alone in the wilderness and for the family members back home; and two people gave reasons related to group travel, with one stating that it is a nice tool for the wilderness community, not just for those in one's own group, but for anyone in another group who could benefit from having someone with a PLB come across their path during a worst-case situation.

Of the 33 interview participants who traveled with a PLB, 30 said that having one with them did not influence any decisions they made while on the trip, two said "it might," and one said that it did. The one visitor who said that it did stated that he climbs class three peaks solo with two replacement knees, and that having a PLB was a part of making the decision to travel in those conditions. One of the "it might" respondents said that having a PLB "allows me to keep doing the same things I did before; perhaps I would be less inclined to continue the same behavior, be more cautious" otherwise.

Eight of the 32 interview participants who did not carry a PLB said that traveling with a PLB could or might influence their decisions. Examples included deciding to travel in trailless areas, and that it would make other areas more available (i.e., they might visit places with a PLB that they otherwise would not visit).

Of the 33 interviewees who traveled with a PLB, 28 said that having a PLB with them did not influence what they did or where they went, while 5 said that it did. Examples included "Knowing I have it, I continue to hike alone in trailless areas," and "I do solo backpacking, am more comfortable [with a PLB.]" Of the 32 interviewees who did not travel with a PLB, 10 said that traveling with one could have an influence on what they did or where they went, if they had one. Examples included going farther out of one's comfort zone and letting the PLB substitute for instincts, being more likely to travel into trailless areas, taking more hazardous routes, spending more time in trailless areas, exploring areas they otherwise would not explore, and being more likely to travel alone.

Three of the 33 interview participants who carried a PLB said that having one influenced their decisions to travel in environmental or terrain conditions they otherwise would not have, including taking more risk and traveling in steep terrain. Of the 32 interviewees who did not travel with a PLB, 11 said that having a PLB would influence their decisions to go to more remote areas, to go farther alone, and to travel in unknown or more mountainous or dangerous terrain.

None of the 33 interviewees who carried a PLB said they did anything on their trip that might have increased their risk because they had a PLB with them. Seven of the 32 who did not carry a PLB said that carrying one could influence them to take more risk, including traveling in trailless areas, attempting more rugged terrain, canyoneering, crossing snowpack and steep snowfields, and solo travel.

When asked directly if they would be more likely to travel alone because they had a PLB, 18 of the 33 PLB subjects said they would be more likely to travel alone because they had a PLB. Ten of the 32 non-PLB subjects said that if they did have one, they would be more likely to travel alone in the wilderness.

Interviewees were asked if having a PLB affected how they engaged with the wilderness. Of the 33 interviewees who carried a PLB, 4 answered yes in a positive way, saying they were able to enjoy it more, they were not as worried, they didn't feel guilty making their family worry, and that it cut down on the uneasiness. Two answered yes, but in a negative way: "When I have to wait for it, it slows me down," and "I wish I could leave it behind because there is a connectedness; I prefer complete solitude but carry one for family and for safety."

Of the 32 interview participants who did not carry a PLB, 10 said they thought having a PLB would have a positive effect on their wilderness experience, allowing them to have

peace of mind, and enabling them to go into the wilderness alone and/or to go into trailless areas or more remote areas. One said that PLBs would enable people to access less-visited portions of the wilderness and areas with more options for places to go and things to do, therefore improving their wilderness experience. One person said that having a PLB would enable them to stay in touch with their babysitter so both adults could go on the wilderness trip together. Six people said that carrying a PLB would negatively affect their wilderness experience – the PLB would take away from the value of being isolated, could influence people to do stupid stuff, increase accidents, detract from the self-reliance of the experience, detract due to the thought that someone could track you, and it could "blur a necessary sense of taking responsibility for my actions."

Discussion

From the written survey, we found that 15% of SEKI Wilderness visitor groups carried a PLB in the summer of 2011. As these devices become more commonly known, lighter, easier to use, and cheaper, one can only speculate on how many groups will carry them in the future, but it is almost certainly likely to increase. Monitoring this would be relatively easy for areas that require permits, and it would provide managers with an opportunity to educate visitors about the appropriate use of PLBs.

We examined visitor beliefs about handheld information and communication technology in wilderness using a set of statements adapted from Pope and Martin (2011). The general pattern of responses was similar to Pope and Martin, although we did not find as many significant differences between PLB-users and non-PLB users in our study. This shouldn't be surprising, since carrying a PLB doesn't necessarily make one "pro-technology," nor does not carrying one necessarily make one "anti-technology." The statement garnering by far the least amount of agreement from both groups was that technology could successfully substitute for skill, experience, and knowledge in the wilderness, a finding that mirrors that of Pope and Martin (2011). The statements receiving the most agreement from each of the groups (PLB and non-PLB) were the same, or very similar, to what Pope and Martin found, but were near-opposite statements from each other. Non-PLB users felt strongest that technology creates a false increase in safety for wilderness users, while PLB users felt strongest that they would feel safer by having technology with them on a wilderness trip. Visitors who carry PLBs and those who don't, at least in our study, have very different opinions about the safety advantage of carrying one.

Turning to the interview results, we found that most PLB users travel with them for safety reasons, to stay in communication with family, and because it was a way to facilitate, and in some cases even justify, solo travel. Nearly all PLB users we interviewed said that having the device did not influence their decision making, and none of them said that they did anything that might have increased their risk because they had a PLB with them. However, when more specific follow-up questions were asked, more of the PLB users (between 9% and 54%, depending on the question) admitted that carrying a PLB did influence at least one of the following: where they went, what they did, whether they traveled in certain environmental or terrain conditions, and whether they traveled alone. Carrying a PLB does appear to influence some decisions, whether or not the person carrying it thinks of it in those terms. According to our interviewees' self-reports, having a PLB did not influence their real-time, on-the-ground, risk-taking behaviors during the trip. (It would be interesting, although perhaps challenging, to collect actual behavioral data on this question.) Carrying a PLB does, however, appear to influence pretrip decisions such as whether to travel solo, travel cross-country in trailless areas, or tackle more difficult terrain or more remote locations, at least for some visitors.

Wilderness managers and scientists (Cole 1997; Cole 2001; Oye 2001) have expressed concern about the potential for increased resource and social impacts in low-use, often trailless portions of wilderness areas, arguing that such areas are "typically the most pristine portions of our wilderness resource and by their very nature the most sensitive to changes in visitor use levels or patterns" (Van Horn 2007). Visitor experiences in these remote areas may also change; Van Horn notes that "once a user-formed trail exists in a cross-country area, the experience in the future changes from exploration and discovery to one of simply following the obvious signs left by those that have been there in the past."

Most PLB users said that having the device with them did not alter how they engaged the wilderness, and some interviewees said that it improved their experience – that having a PLB allowed them to enjoy the wilderness more because it cut down on uneasiness, worry, and the guilt of making family members

worry. Other interviewees expressed concerns about PLB use in wilderness, such as visitors needing to be able to self-rescue, and knowing when to use or not use a PLB. Several interviewees suggested establishing a protocol for acceptable PLB use in the wilderness, similar to Leave No Trace (LNT) guidelines, so people do not use PLBs inappropriately or irresponsibly. One person had rescue personnel in mind:

> Changes in wilderness traveler behavior engendered by beacons are an issue. Such changes in behavior have important consequences for rescue personnel who might be called upon to help people in need. I think some serious education is necessary for beacon owners and potential owners as to just what calling [for] a rescue means and the consequences.

Understanding how handheld information and communication technology influences the behaviors and decision making of wilderness visitors is important for managing wilderness search and rescue operations, managing wilderness resource conditions, developing visitor management guidelines, and educating visitors in appropriate use of technology in the wilderness (e.g., whether to post detailed cross-country route information online, guidelines on when to use a PLB to request a rescue). To the extent that PLB use provides an impetus or a rationale for more visitors to travel alone and/or in trailless areas, and we did find some evidence for this, wilderness managers should probably be concerned about the potential increase in search and rescue calls, as well as the potential for resource and social impacts spreading into previously pristine or near-pristine areas. Although PLBs may not influence a large percentage of wilderness visitors to travel alone or in more remote, trailless areas, even a relatively small percentage of visitors doing so could have significant implications for the condition, management, and monitoring frequency of these areas. On the plus side, PLBs may provide both visitors and the people they leave behind with peace of mind benefits derived from enhanced safety and security (real or perceived), resulting in wilderness visits that otherwise might not happen.

Next steps for managers, researchers, and SAR personnel could include development of LNT-type guidelines for appropriate use of PLBs, and an accompanying visitor education effort; creation of a national wilderness database to monitor SAR events, noting variables such as what technology (if any) the person/group had and used, group size, distance from a trailhead, whether they were in a trailless area, and some type of assessment of the emergency level of the situation (i.e., how justified was the SAR request); and monitoring how many wilderness visitors are using PLBs, either as part of an existing larger visitor monitoring effort, and/or as a common component of future wilderness visitor studies.

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The authors would like to thank Alan Watson (ALWRI) and Gregg Fauth (SEKI) for their support and collaboration, and to thank our anonymous reviewers for their helpful and insightful comments on the draft manuscript.

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Continued from FIFTY YEARS OF SCIENCE SUPPORTS WILDERNESS STEWARDSHIP, page 24

The next eight papers provide comprehensive synopses for a variety of research topics, including social science, recreation ecology research specific to carrying capacity, recreation ecology research relevant to recreation experiences, economic values of wilderness, fire science, a framework for the challenging topic of wildlife research, an evaluation of how much manipulation and intervention is appropriate, presentation of a soundscape assessment framework, an evaluation of how diverse the ecosystems are in the national system, and finally a "think piece" on how we can maintain the relevance of the wilderness system in a rapidly changing society.

Of the two cases studies, one looks back and one looks forward. The case study on the Boundary Waters Canoe Area Wilderness provides an overview of how science has helped managers over the past four decades. The case study on Bureau of Land Management's (BLM's) Lost Coast of California looks to future challenges managers will face with the development and deployment of new technology, including social media, drones, motorized paragliders, and personal locator beacons.

In addition to the 14 papers and 2 case studies, there are 4 short pieces that provide photos with captions that tell stories. These highlight a variety of topics that might surprise readers not familiar with wilderness, such as how the BLM met the challenges of excavating a dinosaur skeleton in Bisti/De-Na-Zin Wilderness in New Mexico. Another photo shows how wilderness character can be greatly enhanced by river restoration, using the example of the dams removed on the National Park Service–managed Elwha River in Olympic Wilderness, Washington. The important role fire science has played in supporting mangers' reestablishment of natural fire regimes is highlighted to show how research in wilderness can have a major impact on national fire policy on all lands. And, finally, a photo of Lyndon Baines Johnson signing the Wilderness Act into law on September 3, 1964 is presented in celebration of this important event.

Thus, the March 2016 *Journal of Forestry* Wilderness Science issue is a key foundation document, together with the wilderness manager survey and the August 2014 *International Journal of Wilderness* issue, for the development of a new science strategy for wilderness in the United States.

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Wilderness Management Distance Education Program

BY KARI GUNDERSON

Imagine yourself at home in your favorite chair, dressed comfortably in sweat pants and a T-shirt while actively increasing your knowledge and understanding of wilderness. You choose when to participate in the "virtual classroom," when to communicate with your instructor, and when to interact with your classmates from around the world (Gunderson 2006). The Wilderness Management Distance Education Program (WMDEP) removes the constraints of time and location, and presents the most current wilderness knowledge available through a suite of online courses sponsored by the Arthur Carhart National Wilderness Training Center and the Wilderness Institute, College of Forestry and Conservation at the University of Montana.

The WMDEP offers accredited university courses for a comprehensive study of wilderness management. WMDEP is a valuable tool for understanding the wilderness resource and the issues surrounding its management, including topics ranging from philosophy and ecology to recreation and planning. It is a joint federal agency and university effort to increase wilderness scholarship among professional wilderness managers, outdoor recreational planners and educators, members of conservation groups, students, and interested citizens.

Kari Gunderson.

The History of Wilderness Management Distance Education

Distance education is not a new concept. Dating back to the early 1700s, advertisements first appeared for courses offered by mail through correspondence study. Distance learning took advantage of rapidly advancing technologies, incorporating radio, satellite broadcast, interactive TV, video, CD-ROM/DVD, Internet, computer, mobile/handheld devices, and social media. During the 1960s and 1970s, distance learning expanded to address people who live in geographically isolated areas. Reasons for the popularity included escalating costs of traditional residential education, interest in informal and nontraditional education, a more mobile population, the growth of career-oriented activities, and the need for learning new skills. By 2012, more than 85 percent of postsecondary institutions offered courses or degree programs online (Hanover Research 2014).

Peel (1999) conducted a study of the WMDEP program and found that learners in academic online courses learn as effectively as they do in the classroom and that attitudes and satisfaction regarding distance education are generally positive. WMDEP has increased in popularity since its inception in 1978 and is the longest running academic wilderness management program offered in the United States (E. Krumpe, personal communication, December 2, 2015).

WMDEP was first piloted in 1995 as a partnership arrangement between the University of Montana and the University of Minnesota (Peel and Freimund 2000). The purpose of the effort was to refine recreation management curricula, improve the program's efficiency in developing future curricula, and increase the reach (access) for potential students to the information within the WMDEP. Functions of an effective learning environment were also

examined during the pilot course. Each function corresponded to a characteristic of online education identified in the published results of early studies in other disciplines. The characteristics included:

- Access to information
- Relevance
- Currency of information
- Role of the instructor
- Student control over the learning environment
- Interactivity, collaboration, and engagement
- Knowledge creation
- Problem-solving ability
- Higher-cognitive domains

Feedback from students indicated good access to information. The Internet format allowed material to be updated easily and quickly. The instructors successfully fulfilled their roles of technical facilitator and pedagogical collaborator. Students and instructors interacted well, and knowledge creation and problem solving were also apparent.

WMDEP Delivery Methods

WMDEP courses are offered in two formats: Traditional and Online. Traditional distance education (correspondence) courses using a study-guide format are self-paced, allowing students the freedom to learn when and where they wish. Upon enrolling, students receive a study guide for the course that explains how the program works, including how to apply for academic credit, providing the option of one additional six-month extension for course completion if needed, and preparing for the final exam. Students can register and start any of the four courses at any time and have six months from the time they register to complete the course requirements, including taking the final exam.

Online courses utilize online resources to help students augment their learning experience by engaging with the material and interacting with the instructors and other students. These courses generally adopt an asynchronous learning style in which students are encouraged to regularly check in on the course website for information and to participate in weekly discussion forums with experts. The discussion forums enable interaction between students and leaders in the field of wilderness management. These online courses are designed to cover the material in about 16 weeks; however, just as in the correspondence course; students have six months to complete all course requirements. **The online format is offered twice a year (fall and spring)**, and the undergraduate-graduate courses are cycled and repeated with an every-other-year offering.

WMDEP Course Descriptions

The courses within the WMDEP graduate and undergraduate curriculum target key competencies for wilderness professionals, managers, and advocates. The WMDEP courses have recently been revised and updated for accessibility so they are in compliance with the Americans with Disabilities Act. These courses are:

1. **Wilderness in the American Context (undergraduate)**
   American Wilderness Philosophy and Policy (graduate)
   - Lays the groundwork for all other courses in the program
   - Provides a broad perspective of what wilderness is and how the idea developed
   - Exposes students to differing values, ethics, and expectations of wilderness held by society
2. ***Management of the Wilderness Resource* (undergraduate)**
   ***Managing Wilderness Ecosystems* (graduate)**
   - Covers the principles of ecosystem ecology and applications in wilderness management
   - Explores the management of specific wilderness resources (e.g., fire, wildlife, and cultural and historical sites, nonconforming uses)
   - Investigates the use of traditional skills and tools
3. ***Managing Recreation Resources* (undergraduate)**
   ***Managing Recreation Resources in Wilderness Settings* (graduate)**
   - Examines recreation management in a wilderness setting
   - Provides strategies for addressing visitor use, measuring and monitoring biophysical and social impacts, and communicating effective wilderness education, including interpretation and conceptual approaches to communication

"WMDEP is a valuable tool for understanding the wilderness resource and the issues surrounding its management, including topics ranging from philosophy and ecology to recreation and planning."

- Covers search and rescue protocol and law enforcement

4. **Wilderness Management Planning (undergraduate)**
   Wilderness Planning: Theory, Management Frameworks, and Application (graduate)
   - Capstone course that explores basic planning theory, planning concepts, and effective plan writing
   - Examines the role of public participation in planning

Impact of WMDEP

WMDEP students come from all walks of life, from across the United States and around the world.

The courses provide a foundation in wilderness management and offer the skills needed to become a successful wilderness manager, they can help earn credits toward a degree, or they can be taken solely for personal satisfaction. WMDEP students might be seasonal wilderness rangers; interpreters in the national parks; backcountry law enforcement rangers; outdoor educators and teachers; staff members from nonprofit organizations; regional wilderness directors; wilderness fellows; state, county, or municipal park planners; or university students. Some students with permanent positions with federal land management agencies are taking the courses to qualify for a different job series or higher pay grade. Seasonal employees take the courses to make them more competitive for permanent positions.

The WMDEP courses also offer an educational opportunity for US Forest Service Pathways students, who are required to be enrolled as full-time students in a certificate program. Others are considering a transition into a different career path and are exploring a long-held interest in wilderness. The four WMDEP courses taken for graduate credit also lead to a graduate certificate in wilderness management. Established in 2009, the graduate certificate provides students and professionals with training and expertise to pursue careers in wilderness management. As part of the graduate course requirements, students in the certificate program write research papers that can be submitted as manuscripts to the *International Journal of Wilderness* and other natural resource professional journals for publication (McKinney 2011). Alumni of the certificate program have reported that the WMDEP courses helped them obtain permanent positions with one of the four US federal land management agencies with wilderness management responsibilities.

Overall, the impact of WMDEP can be seen in the personal narratives of students and alumni. These narratives illustrate multiple key themes, which include:

- **Online instruction knows no geographic boundaries.**
  "I am a recreation manager in Iceland and the information, guidance, and encouragement I received from the instructor is very useful in my position."
- **Distance learning is convenient.**
  "The WMDEP staff was incredibly supportive and flexible. They wanted me to succeed and worked with my ridiculous schedule to make that happen."
- **Online courses promote contemplative and reflective learning opportunities.**
  "I entered the program to gain a foundation in wilderness management in my quest to acquire the skills I would need to be successful as a resource manager. I was selected into my dream job because of the knowledge base I gained through the WMDEP program."
- **Online courses can provide a depth of interaction from instructors and students not achievable in a large classroom environment.**
  "The WMDEP enhanced my understanding and appreciation for modern wilderness management within the federal land management agencies by developing a solid foundation and appreciation for the diverse issues land managers and the public face to permanently protect wilderness resources and character."
- **The online format reduces preconceived notions based on students' age, gender, race, background, or level of experience.**
  "I have worked for the Forest Service as a trails and recreation manager for many years and it has been a long time since I last attended college so I questioned how well I would do in the program. I was able to apply much of what I learned immediately to my current position."
- **With tight budgets, WMDEP courses provide professional development that is cost effective.**
  "This is my fourth course in Wilderness Management Distance Education Program with the University of Montana and I have never been disappointed. Great classes! Got my money's worth!"

Conclusion

In a recent survey, wilderness managers rated the degree to which they believed goals and objectives of the 1995 Interagency Wilderness Strategic Plan had been accomplished. In the area of "Public Awareness and Understanding," wilderness managers rated wilderness education as underachieved (Ghimire, Green,

Continued on page 46

Southern Ground Hornbill

Status, Threats, and Management Strategies in the Kafue National Park, Zambia

BY VINCENT R. NYIRENDA

Abstract: The southern ground hornbill (SGH) is a tourism flagship and yet vulnerable avian species, currently decreasing in most of its African wild range due to anthropogenic causes. SGH's status and associated threats were investigated in core habitats of the expansive Kafue National Park (KNP) and its surrounding Game Management Areas of Zambia. Using data from a Systematic Reconnaissance Flight sampling method and Management Effectiveness Tracking Tool for Protected Area Systems, the study established that KNP supported about half of the SGH population (47.73%, n = 2112) within the Kafue ecosystem due to mitigation of anthropogenic disturbances such as uncontrolled fires, human encroachment (e.g., settlements and mining), and deforestation from agrarian and timber harvesting chores. KNP had most of the breeding pairs in the ecosystem (57.14%, n = 80). It is recommended that wild areas protection through law enforcement, integrative land-use practices, and conservation awareness be strengthened for enhanced SGH stewardship.

The southern ground hornbill (SGH) (*Bucorvus leadbeateri*), plays major ecological and socioeconomic roles in the wild. It is a keystone species and effective seed disperser that contributes to ecological succession processes (Holbrook and Smith 2000). Based on its large charismatic-sized body (Figure 1), it serves as a tourism flagship species for biodiversity conservation and acts as a bioindicator for savannah biomes (Engelbrecht et al. 2007; Verissimo et al. 2009). The SGH is found in a number of habitats such as woodlands, savannah grasslands, and farming landscapes (Leonard 2005; Engelbrecht et al. 2007). It was previously abundant across its geographical ranges of eastern and southern Africa prior to 2011 when it was declared a species of regional conservation concern (Leonard 2005; Trail 2007). Populations have been waning in much of its range, and it was later declared a vulnerable species by the International Union for Conservation of Nature (IUCN) (Birdlife International 2015).

Figure 1 – Southern ground hornbill. Photographed by Hendri Coetzee.

Vincent R. Nyirenda. Photo by Saviour Kambole.

The SGH decline is attributed to a combination of biological and environmental factors. Biologically, its population is limited by low reproductive rates (Kemp and Begg 1996; Coetzee et al. 2014), and the need for large range areas in excess of 100 km^2 (1,076 ft.^{2}) per flock (Theron 2011). Although population viability is enhanced by cooperative breeding tendencies in SGH, where alpha breeders raise young in collaborative action with other family members, only one of the two to three hatched chicks in an egg clutch survives starvation before fledging (Kemp and Kemp 1991). Environmental factors such as deforestation affect breeding processes, as the SGH is a tree cavity breeder (Kemp and Begg 1996; Trail 2007). African elephants (*Loxodonta africana*) also destroy trees used by nesting birds (Vogel et al. 2014). Climate variability and change expressed by extreme weather events such as floods and drought may also

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negatively affect availability of forage and cavity trees (Pounds et al. 1999; Myers et al. 2000; Sinervo et al. 2010).

Several SGH studies have been conducted in African ranges such as South Africa, Lesotho, Swaziland, Kenya, and Tanzania, where its vulnerability to extinction has been attributed to habitat fragmentation, disturbance, and cultural persecution (Hulley and Craig 2007; Coetzee et al. 2014). However, the status of the SGH remains largely unknown in its presumed stronghold and epicenter, Zambia (Birdlife International 2015). Globally, scientists lack detailed distribution and abundance data for most species of conservation concern (Andelman and Fagan 2000). Both its expansive ranges and the fact that it is a low-density species pose practical difficulties for SGH inventories, resulting in a dearth of information on its occupancy and abundance in much of its ranges. The purpose of this study was to ascertain the SGH status in Kafue National Park (KNP) and the associated threats, relevant for conservation interventions targeting SGH as a keystone and flagship species.

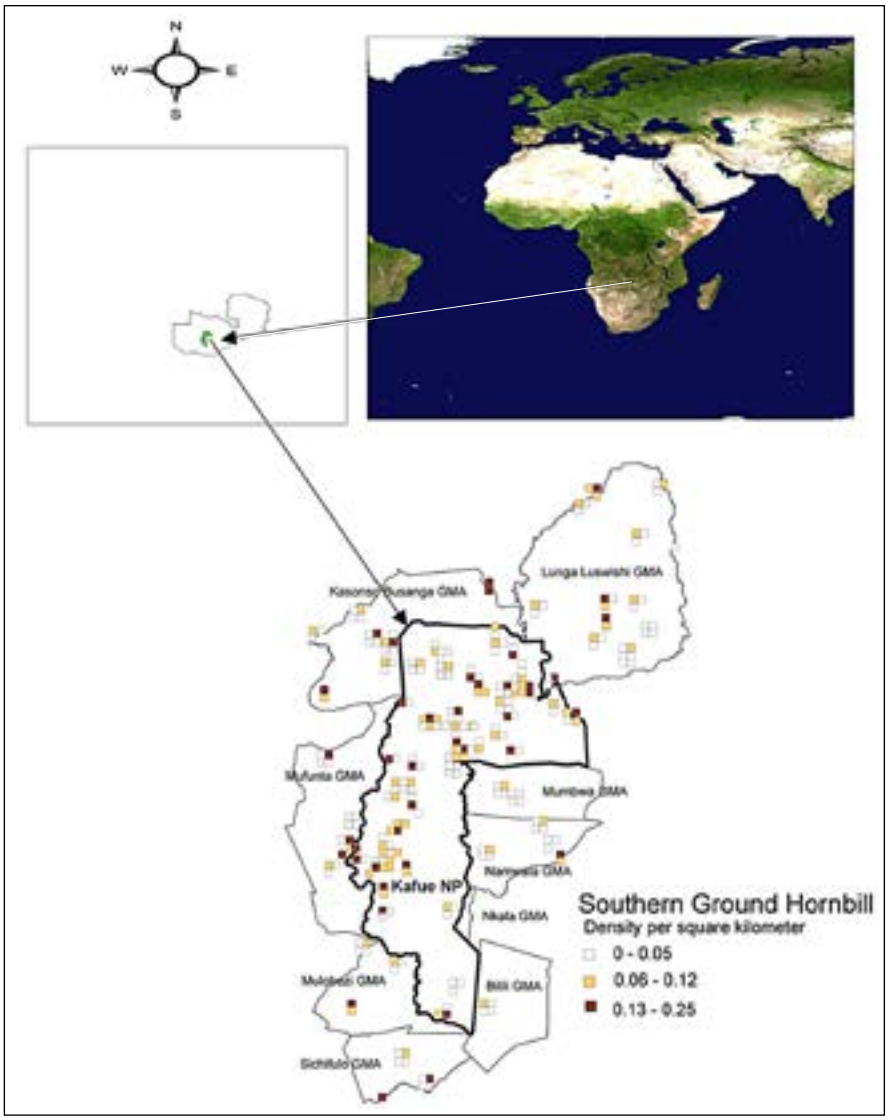

Figure 2 – Sampled southern ground hornbill density and distribution in the Kafue National Park and its adjoining Game Management Areas, Zambia, September–October 2011.

Methods and Materials

Study Site

The study was conducted in the expansive Kafue National Park (22,480 km^2/8,679 ft.^{2}) and its adjacent areas, constituting nine Game Management Areas (GMAs) (43,408 km^2/16,759 ft.^{2}) of Zambia (Figure 2). On an annual basis, KNP attracts thousands of nature-based tourists, with the SGH as part of the attraction. KNP has 11 key vegetation community types, predominantly miombo woodlands, providing habitats to more than 492 sympatric bird species (Leonard 2005; Mwima 2005). The adjacent GMAs are inhabited by more than 200,000 people, unlike KNP where human habitation is not permitted. In addition, the GMAs are multiple-use areas (e.g., agriculture, mining, and logging), exerting pressure on KNP.

Spatial Distribution of Southern Ground Hornbill

The Zambia Wildlife Authority (ZAWA) conducted an aerial wildlife survey between September–October 2011 in the KNP and its surrounding areas using a Systematic Reconnaissance Flight (SRF) sampling method described by Norton-Griffiths (1978) (ZAWA, unpubl. report). The survey period coincided with the dry season when vegetation sheds its leaves, enhancing the visibility of SGH. The survey team used a fixed-wing Cessna 206, involving a pilot, a front-seat observer (FSO-Recorder), and two rear seat observers (RSO-Observers) for bird counts over a stratified area, with transects traversing environmental features such as rivers, mountains, and vegetation types. Surveying across different environmental features accounted for variability in resources, influencing the distribution of birds (Sinclair et al. 2006). Onboard GPS

(Garmin 296) was used for taking coordinates and radar altimeter was used for monitoring the flying height above ground level (approximately 100 m/109 yards). Transects were regularly spaced at distances of about 2.5–5.0 km (1.55–3.11 miles) apart, resulting in a sampling intensity of between 10–20%. Bird counts were done in subunits of 1.0 km^2/10.76 feet^2, representing approximately 30-second flying intervals, and constituting recording intervals.

Bird count data was analyzed based on Jolly's Method 2 for unequal sized sample transect units (Jolly 1969). The Jolly's Method is based on the ratio calculations accounting for wildlife seen and counted in relation to areas searched (detection probabilities), extrapolated to the strata, based on the birds' density per sample unit (Norton-Griffiths 1978).

Threats to Southern Ground Hornbill

Threats to the SGH were assessed in the study area based on secondary data obtained from management effectiveness assessments by ZAWA (unpubl. report). The Management Effectiveness Tracking Tool for Protected Area Systems (METTPAS) (Hockings 2003; Hockings et al. 2006) was used to assess the levels of anthropogenic threats to the SGH. Based on perceived magnitude and severity, a group of 59 experienced and knowledgeable staff and stakeholders rated the threats to SGH (i.e., wildfires, human encroachment, and deforestation) in KNP and its adjacent GMAs on a scale of 0–5 (0 represents insignificant threats; 5 denotes very high magnitude, severity, or frequency in the last five years). In determining the ratings, each participant compared the associated impacts across the threats.

Results

Spatial Distribution of Southern Ground Hornbill

The core occupancy of SGH in the Kafue ecosystem (65,888 km^2/25,439 miles^2) lies in KNP (Figure 2 and Table 1). KNP supports nearly half (47.73%; n = 2,112) of the SGH in the ecosystem, with more than half of breeding pairs (57.14%; n = 80). Mean flock densities for KNP were higher than for adjacent GMAs (Figure 3), which had relatively greater magnitude of disturbances (Figure 4). Although much of KNP is covered by miombo woodlands, SGH were found mostly in northern and western-central areas of the park, corresponding to areas of high biodiversity, and high protection levels and less vulnerability risks. In the adjacent GMAs, SGH was mostly

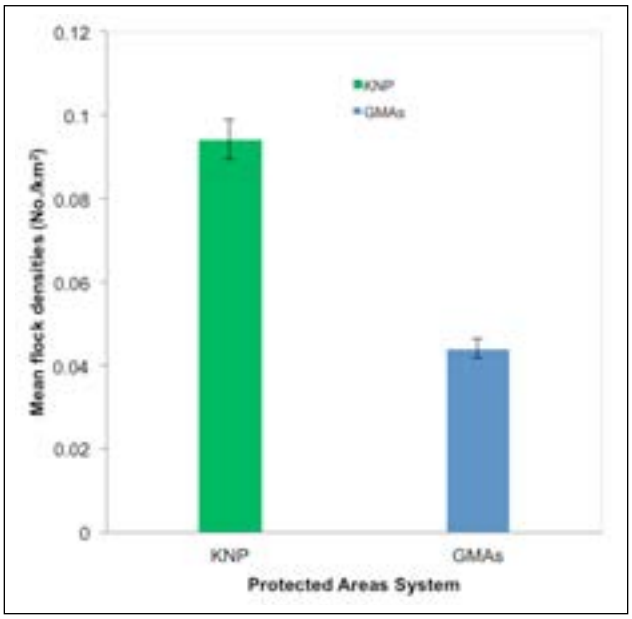

Figure 3 – Mean southern ground hornbill flock densities across the Kafue National Park and its surrounding Game Management Areas, Zambia, in 2011.

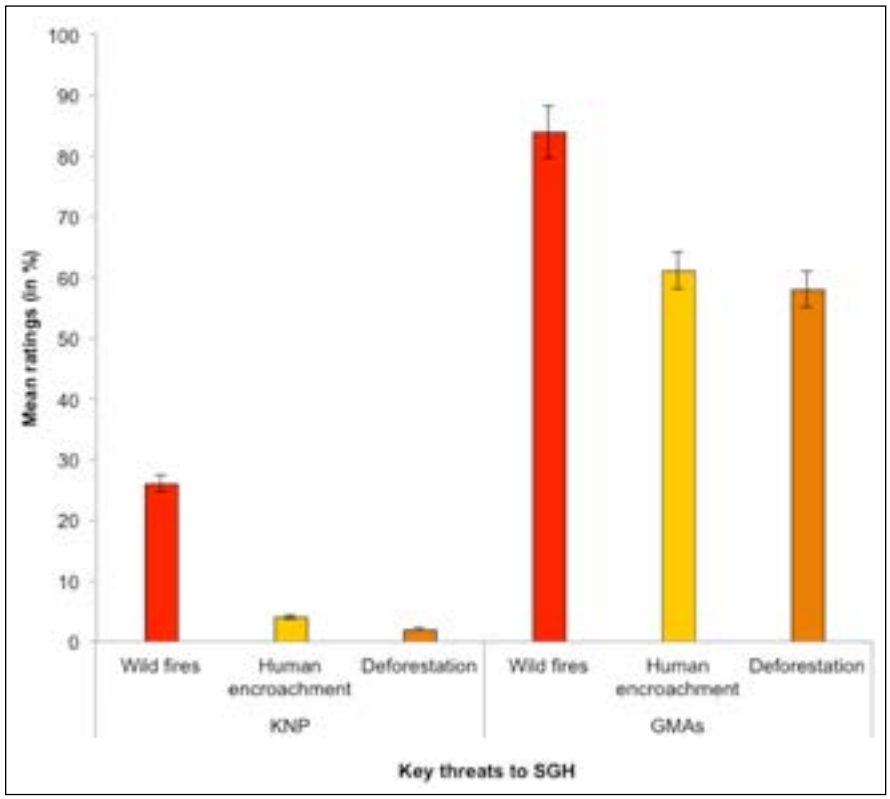

Figure 4 – Key threats to southern ground hornbill in the Kafue National Park and its surrounding Game Management Areas, Zambia, in 2011.

Table 1 – Southern ground hornbill population estimates and number of breeding pairs across different categories of protected areas in Kafue National Park and its surrounding Game Management Areas, Zambia, in 2011

Protected Area name	Parameter							
	Protected area category	Protected area size (km²)	Sample area (km²)	Flock size	Estimated total individuals	Standard error	95% Confidence limit	No. of breeding pairs-seen
Kafue	NP	22,400	3, 400	2–12	2,112	637	1,249	80
Bilili Springs	GMA	3,080	191	2	9	—	—	1
Mulobezi	GMA	3,420	334	2–6	385	166	325	11
KasonsoBusanga	GMA	7,780	606	2–6	248	114	233	9
LungaLuswishi	GMA	13,340	1,309	2–10	1,130	413	809	23
Mufunta	GMA	5,104	726	2–9	360	156	313	11
Mumbwa	GMA	3,370	371	2	9	—	—	1
Namwala	GMA	3,600	268	2–6	83	235	478	2
Nkala	GMA	194	29	2	8	—	—	1
Sichifulo	GMA	3,600	308	2	81	37	75	1
Total	**—**	**65,888**	**7,542**	**2–12**	**4,425**	**—**	**—**	**140**

sighted in the miombo woodlands and closer to the park boundaries.

Anthropogenic Threats to Southern Ground Hornbill

The key anthropogenic threats to SGH in KNP and the surrounding GMAs as rated by participants were wildfires, human encroachment, and deforestation, especially in the GMAs (Figure 4). Mean ratings for the combined threats differed significantly between KNP and GMAs ($F_{(28, 29)} = 75.65$; $P \leq 0.001$), for their perceived magnitude, severity, and frequency. Due to stricter protective measures, KNP had less frequent and severe fires, marginal human encroachment, and deforestation than GMAs (Figure 4).

Discussion

The expansive nature of KNP and its surrounding GMAs, with a variety of habitats, makes the area important for SGH conservation and nature-based tourism. The major threat to SGH in KNP is wildfires. Wildfires mostly originate from GMAs where humans use fire for activities such as agricultural land clearing, artisan mining, traditional wildlife hunting, and timber harvesting. Other sources of wildfires in KNP include wildlife poachers' camps and lightning-ignited fires. The wildfires destroy SGH food sources such as reptiles, snails, insects, and small mammals. Further, although KNP has not been encroached or deforested on its boundaries, there are pressures and threats from settlements and agrarian activities in nearby GMAs such as Mumbwa, Bilili, and Sichifulo (Figure 1). Unplanned settlements and agricultural and other land uses such as timber harvesting are also common in the GMAs.

In the park, several mediating factors help to curb threats to SGH and its habitats. These include stakeholder conservation education, legislative and law enforcement measures such as wildlife and habitat protection, and zoning that provides stringent limits on use. These factors are in contrast to those human activities occurring in the GMAs where weak governance exists and wildlife law enforcement officers are ill-equipped and poorly funded to effectively conduct law enforcement and natural resource protection. However, the mediating factors for SGH conservation in the GMAs include supportive traditional beliefs and local community involvement in the natural resource management, each of which are still frail and in their formative stages. For example, local communities may not kill SGH on the account that it announces the start and end of rain-fed crop-farming season, and killing SGH brings forth omen on them.

The ZAWA emphasizes protected area management strategies that play a role in the survival and recovery of wildlife, especially in KNP. The

management team focuses on improving its management effectiveness for KNP within its limited financial and technical resources. It also encourages broad-based local stakeholder involvement and participation in natural resource management. Given that SGH and other wildlife in KNP require large tracts of land for their survival, multistakeholder support is required for their conservation. Unlike in some geographic ranges such as South Africa where ex situ (nonfree ranging off-site original range) conservation research and conservation interventions have been extensively implemented to serve as panacea to risks of "local" extinction (Cousins et al. 2008), KNP has promoted in situ conservation, where SGH are conserved on expansive and free-ranging basis in their original range. In situ conservation is less time consuming, technically demanding, and costly (Sweeney 2010), and, therefore, affordable in the long term.

In addition to the existing management strategies, the SGH should formally be adopted as the tourism flagship species to increase management effectiveness. In recent years, in order to enhance local support for protection of wild habitats and wildlife, KNP management has embraced the local communities for self-empowerment in infrastructure and tourism development inside and outside the park via avenues such as employment creation and skills training (e.g., tour guiding). However, monitoring of the resource base, including SGH populations and their habitats, should also be prioritized by the wildlife agencies and other stakeholders.

Conclusion

KNP's wild areas support substantive abundance of SGH. However, SGH vulnerability continues to escalate due to unabated anthropogenic activities in the surrounding GMAs. A suite of conservation strategies against threats to SGH populations is recommended. In situ conservation interventions should be prioritized, as it may be more practical and cost-effective for countries within SGH geographic ranges than are ex situ conservation strategies. Such in situ conservation strategies will likely support SGH in the wild on a long-term basis for nature-based tourism and perhaps even enhance wilderness attributes such as wild aesthetic beauty.

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Continued from FIRST STEPS TO MEANINGFUL ... RELATIONSHIPS WITH NATIVE PEOPLES, page 15

By making sincere efforts to better understand Native groups and their respective wilderness values, protected area managers and planners can build trusting relationships. They can be inspired by Native wisdom to look for ways to combine our passion for the land and our contemporary knowledge of managing wild places with our Native peoples' ancestral devotion and knowledge of all things natural. The time is now to embrace such guidance by reaching out to our neighboring Native communities in sincere and respectful ways to engage them in public land planning and stewardship – an endeavor that ultimately will result in a restored life-balance that all peoples can accept and value.

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GREGORY HANSEN (Ponca) is retired from the USFS office in Washington, D.C., served for more than 10 years as the Tonto NF Tribal relations coordinator, served on the USFS's SW Region American Indian Advisory Council, and has developed/taught American Indian studies in Native communities and at community colleges and for Native museums throughout Indian country. He currently is the Tribal relations coordinator for the Arizona Conservation Corps – Southern Region, where he developed and manages their Native Youth Conservation Corps program. Gregory is honored to serve as a wilderness management, conservation education, and Indigenous cultures consultant, writer, and instructor for the Arthur Carhart National Wilderness Training Center, in Washington D.C., United States; email: redroadone@aol.com.

Announcements

COMPILED BY GREG KROLL

2015 National Forest Service Wilderness Awards

- ***Aldo Leopold Award for Overall Wilderness Stewardship Program:*** **Superior National Forest Wilderness Program**, Region 9, Superior National Forest

Superior National Forest (NF) has consistently driven its program forward striving for outstanding wilderness stewardship, including being the first national forest in the nation to conduct wilderness character mapping, creating a valuable planning resource. In addition, the forest developed the Boundary Waters Canoe Area Wilderness Travel Distribution System and Simulation Model to better understand how people travel in the wilderness. This system, combined with encounter data gathered by wilderness rangers, will significantly enhance the wilderness experience while preserving its character. Superior NF also actively seeks ways to provide public education, including forest staff developing an education program for high school students going on winter camping trips, programs aimed at 1st, 4th, and 6th graders, and efforts such as a YouTube video on the value of youth experience in wilderness. In addition, Superior NF demonstrates its commitment by routinely considering the effects on wilderness character of any action taken on the forest, whether it be related to fuel reduction, mineral exploration, or any other decision.

- ***Bob Marshall Award Individual Champion of Wilderness Stewardship:*** **Steve Boutcher**, Wilderness and Wild and Scenic River Information Manager, Washington Office

For the past 10 years Steve has demonstrated outstanding dedication and active involvement in wilderness stewardship by leading and participating in all of the agency's key wilderness initiatives. He has been an integral member of the Chief's Wilderness Advisory Group (WAG), nurturing and leading the 10-Year Wilderness Stewardship Challenge, begun under Chief Bosworth, to define and stimulate improvements in wilderness stewardship on a national scale. This effort culminated in October 2014 with the announcement that 99% of the agency's wilderness areas were being managed to at least the minimum stewardship level. Steve has been instrumental in cultivating a community of wilderness champions. His guidance and leadership working with WAG, the national Wilderness Information Management Steering Team, and Regional Wilderness Program Managers have helped to develop and launch a new wilderness performance measure – Wilderness Stewardship Performance, which evaluates actions taken to preserve wilderness character. It will soon be accompanied by another project influenced by Steve, a national framework to monitor wilderness character outcomes.

- ***Bob Marshall Award for Group Champion of Wilderness Stewardship:*** **Wilderness 50th Southwestern Region Steering Committee**, Region 3

This interdisciplinary committee was convened to help support the Southwest Region's hosting of the National Wilderness Conference and 50th anniversary celebration in Albuquerque, but far surpassed that goal by raising awareness of the wilderness community and the range of ways to support and interact with wilderness, and by partnering with groups such as New Mexico Wilderness Alliance, The Wilderness Society, Great Old Broads for Wilderness, as well as sister agencies the National Park Service and Bureau of Land Management, nonprofit organizations, and local schools and civic organizations. The committee's support and oversight helped produce a wide array of events including hiking field trips and work days (including integrating with tribal youth on trails); a Get Wild festival with skill demonstrations; development of a Wilderness 50th time capsule; an interagency group lecture series on wilderness; wilderness art shows and contests; and even the creation of playing cards for 52 Forest Service wildernesses. In an even more promising development, youth were hired through Pathways, Student Conservation Association, and Service First Agreements during these efforts, helping to ensure a much longer and broader influence of the committee's

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efforts to foster an appreciation for wilderness and its stewardship.

- ***Wilderness Partnership Champion Award:*** **Jon Erickson,** Wilderness Manager, Volunteer Coordinator, Pacific Ranger District, Eldorado National Forest

Jon fostered, developed, and maintained a broad network of partnerships within and outside the agency during 2014. This included working with many nonprofit groups such as Desolation Wilderness Volunteers, for example. This one partnership resulted in around 3,000 hours of volunteer service in conservation education, trail maintenance, outreach, and campsite restoration. Other similar efforts included groups such as Wilderness Volunteers, the Student Conservation Association, and the Pacific Crest Trail Association. Work with the Great Basin Institute involved four groups of six high school students spending a week in wilderness areas performing trail maintenance and learning wilderness stewardship principles. Jon's efforts also included wilderness trailhead sign creation with Region 5's graphic artist and landscape architect, resulting in 15 panels of new signs, and working with Region 5's Public Affairs office to schedule and screen the film *Green Fire* at public libraries and REI locations in the bay area and Sacramento. Jon is truly a wilderness champion and skilled partnership coordinator.

- ***Excellence in Wilderness Stewardship Research Award:*** **Dr. Steve Martin**, Humboldt State University

Dr. Martin has collaborated with the Leopold Institute, as well as Forest Service and National Park Service units in the Sierra Nevada, to support management and planning decisions by employing science in a diversity of areas, including bear-proof containers and visitor safety, the use of technology in wilderness by visitors, quota decisions based on visitor travel simulation and visitor attitudes about intervention to adapt to climate change, and ecological restoration to fix problems caused by past human behavior. He remains focused on management solutions applied to wilderness stewardship issues relevant across the National Wilderness Preservation System.

- ***Excellence in Wilderness Research Applications Award:*** **Chris Armatas and Carly Campbell**, University of Montana

Through Chris and Carly's efforts, 50 social science data sets dating back to the 1960s are now literally at the fingertips of managers, scientists, and students to analyze and apply to future management decisions and applications. This trove of social science research represents about 75% of all wilderness social science projects conducted worldwide. Data and methods that used to take months to search for are now instantly accessible. Chris and Carly's work even resulted in a first for Forest Service research, a wilderness research publication in a refereed science journal (*Environmental Management*) that included full reference to the supportive archived data, coding manuals, methodology descriptions, and reports. With huge amounts of data yet unanalyzed, the efforts of these two students will influence wilderness studies for a long time to come.

- ***Traditional Skills and Minimum Tool Leadership Award:*** **Lisa McClure,** Wilderness Ranger, Divide Ranger District, Rio Grande National Forest

Lisa's tireless work on the Saw Policy Technical Advisory Group, while championing the regional crosscut saw program, ensures that these traditional skills will survive, but more importantly, that they will be used by competent employees who remain committed to safety at work. By keeping this important skill alive and active alongside other traditional work such as horse and mule packing, Lisa's educational efforts keep the character and values of wilderness at the forefront of consideration for future generations.

- ***Wilderness Education Leadership Award:*** **R5 2014 Tournament of Roses Planning Team**, Pacific Southwest Region

The culmination of nearly two years of planning, the R5 Tournament of Roses Planning Team successfully fielded a parade float during national broadcast of the January 2015 parade with three themes centered on the 50th Anniversary of the Wilderness Act: the role pack stock plays in wilderness and fire management, and wildland firefighters. Besides the massive effort that went into the float itself – which showcased three mule strings, a crew of wildland firefighters, and a wagon with the Forest Service Volunteer of the Year, Smokey Bear, the R5 regional forester, and the chief of the Forest Service – the group also put together fully staffed preparade information and education booths at the Rose Bowl, the LA Equestrian Center Bowl, and the float viewing area. Because of these efforts, information themes about wilderness and fire were broadcast to millions of TV viewers as well as the estimated 80,000 people on hand at the event itself. With the large number of materials and information delivered multiple ways over many days, it was an event of national

distinction for wilderness-related outreach and education efforts.

- ***Line Officer Wilderness Leadership Award:*** **Dave Neely,** District Ranger, Eagle/Holy Cross Ranger District, White River National Forest

Dave manages all or part of three wilderness areas: Holy Cross, Maroon Bells-Snowmass, and Flat Tops. Managing each one is made difficult by high visitor usage and fragile alpine tundra amid peaks that climb 14,000 feet high. Without fail, he stays committed to preserving wilderness in both policy and action, whether hosting a forest-wide, Carhart-instructed wilderness awareness training course, implementing Wilderness Character Monitoring, showing the vision to deny range fencing improvements when alternatives that would preserve the character of the wilderness could be undertaken, or even detailing to the Washington Office to serve as the lead staffer in the Legislative Affairs Office for wilderness and wild and scenic river legislation. His consistent decisions reflect a real commitment to preserving wilderness for present and future generations.

Conservationist Douglas Tompkins Dies in Kayaking Accident

Douglas Tompkins, noted conservationist and founder of the clothing brands North Face and Esprit, died in December 2015 after a kayaking accident on General Carrera Lake in Patagonia, Chile. He was 72. Tompkins was boating with five others when their kayaks capsized due to high waves, and he spent a considerable amount of time in waters under 4 degrees Celsius, according to Pedro Salgado, a local prosecutor. A military patrol boat rescued three of the boaters, and a helicopter lifted out the other three. No one else was seriously injured.

Douglas Tompkins was born in Ohio in 1943. He began rock climbing at age 12, and was skiing and mountain climbing during family trips to Wyoming at age 15. He was a restless outdoorsman for the rest of his life. After selling his businesses, Tompkins and his wife, Kristine, former chief executive of the clothing company Patagonia, moved to South America, splitting their time between their homes in Chile and Argentina. Since 1990, Tompkins used his vast fortune to preserve an estimated 4 million acres (1.6 million ha) of wilderness in the two countries (*IJW* Digest, April 2014). That includes Pumalín Park, one of the world's largest private parks, protecting a swath of rain forest that stretches from the Pacific Ocean to the Andes.

Tompkins's efforts were not immune to criticism. His land purchases and outspoken opposition to salmon farming and dam construction drew criticism from many Chileans and Argentines, who worried that his vast holdings threatened their national sovereignty and stunted economic development. "We want to do something good, but you've got to be very naive and out to lunch to think that certain sectors of society are not going to put up resistance," Tompkins once told *The New York Times*. "If you're not willing to take the political heat, then you shouldn't get into the game of land conservation, especially on a large scale." (Source: *The New York Times*, December 8, 2015)

Proceedings of the 2014 National Wilderness Conference Are Available Online

Celebrating the 50th Anniversary of the Wilderness Act, the proceedings of the National Wilderness Conference held in Albuquerque, New Mexico, in October 2014, is now available online at wilderness.net. The 376-page document was compiled by Susan Fox of the Aldo Leopold Wilderness Research Institute, Chelsea Phillippe of the Sawtooth National Forest, Vicky Hoover of the Sierra Club, and Lee Lambert of Wilderness Forever. The proceedings include transcripts of all plenary presentations, track session abstracts, information about accompanying events, photographs, and more.

Keeping it Wild 2 Is Released Online

Keeping It Wild 2 is an interagency strategy to monitor trends in selected attributes of wilderness character based on lessons learned from 15 years of developing and implementing wilderness character monitoring across the National Wilderness Preservation System. This document updates and replaces *Keeping It Wild: An Interagency Strategy for Monitoring Wilderness Character Across the National Wilderness Preservation System* (Landres and others 2008), and provides a foundation for agencies to develop a nationally consistent approach to monitoring. This strategy addresses two questions: How do stewardship activities affect attributes of wilderness character, and how are attributes integral to wilderness character changing over time within a wilderness, within an agency, and across the National Wilderness Preservation System?

Keeping It Wild 2 is designed to be nationally consistent across the four wilderness-managing agencies and locally relevant, to be cost-effective, and to facilitate communication across the many resource programs

that are responsible for preserving wilderness character. Implementing this monitoring strategy does not guarantee the preservation of wilderness character, but it informs and improves wilderness stewardship and ensures that managers are accountable to the central mandate of the 1964 Wilderness Act to preserve wilderness character. The online version is available at http://www.treesearch.fs.fed.us/pubs/49721.

Peru Creates a Massive New National Park

A large swath of protected Amazon rain forest has grown by 3.3 million acres (1.3 million ha) due to the establishment of Sierra del Divisor National Park, Peru. The new park, which is larger than Yosemite and Yellowstone National Parks combined, "strategically secures the final link in a 67-million-acre [27 million ha] Andes-Amazon Conservation Corridor, forming one of the largest contiguous blocks of protected areas in the Amazon," according to the conservation group Rainforest Trust. The new park links a number of protected areas, filling in a gap in a ribbon of wildland extending for more than 1,100 miles (1,700 km), from the banks of the Amazon River in Brazil to the high peaks of the Andes. The resulting protected wildlife corridors will help maintain the genetic diversity of rare species and provide wildlife with more space for adapting to climate change.

Large mammals such as jaguars and tapirs, which are in decline throughout much of their range, inhabit the park, as well as cougars, giant armadillos, sloths, and a variety of monkeys – including red uakari and Goeldi's monkeys. Eighty amphibian species, 300 kinds of fish, and 550 bird species call the park home. "Its primary forests are massive and maintain not just immense stores of carbon but are also the ark that will help carry huge amounts of biodiversity through the climate change bottleneck," says Adrian Forsyth, executive director of the Andes Amazon Fund. "Thousands of indigenous people now have their ancestral homeland and the natural life support systems that sustain their communities protected by national law. It's a huge win for the planet!"

Meanwhile, illegal coca cultivation (a precursor ingredient used for producing cocaine) is an ongoing problem for Peruvian protected areas. A monitoring team has shown through satellite imagery that a sector of southeastern Peru's Bahuaja Sonene National Park is experiencing deforestation. Monitoring by the Andean Amazon Project, a web portal devoted to presenting information and analysis on important ecological news in the region, pointed to the construction of an illegal new airstrip built between May and June 2015, as evidence that coca was to blame for the forest loss. "The direct ecological impact of the airstrip isn't the issue," said Matt Finer, a research specialist with the Amazon Conservation Association (ACA). "The issue is that it signifies that illegal coca cultivation, which is a major driver of deforestation, remains active in an important Amazonian national park." (Sources: http://thewildlife.wbur.org, November 11, 2015; http://news.mongabay.com, December 29, 2015)

Organizers of ATV Protest Ride Receive Jail Time, Probation, and Fines

A federal judge has sentenced two individuals for organizing, promoting, and driving in an illegal protest in 2014 in Recapture Canyon, San Juan County, Utah. Fifty all-terrain vehicles, carrying multiple riders, including children and one man with an assault rifle at the ready, drove into the scenic canyon, which was closed in 2007 by the Bureau of Land Management to protect ancient American Indian sites. San Juan County Commissioner Phil Lyman was sentenced to 10 days in jail and 3 years of probation. Codefendant Monte Wells, a federally licensed gun dealer, received a five-day jail sentence and three years of probation. In addition, Lyman was fined $1,000 and Wells $500. They are also required to contribute $500 a month toward a $96,000 restitution.

According to the BLM, the riders followed an unauthorized trail, trampling willows, crossing the creek in many places, and driving over eight archaeological sites. The restitution does not reflect actual damage to archaeological resources, but rather the cost of conducting an assessment of the damage, as well as the cost of mitigating erosion and rutting caused by the 32 riders who continued beyond the end of an existing road.

US district judge David Nuffer told Lyman, "This was a highly publicized, well-organized action. It caused considerable disruption and damage." Nuffer called the circumstances surrounding the case "a tragedy" and delivered a homily on the need for people to engage in respectful dialogue: "I see distrust, hostility, anger, fear, hyperbole, people who refuse to acknowledge the validity of others' points of view. We have shared values, our country, our freedom, our land, but the way we go about this is destructive. What good comes out of the conflict with the huge losses that we are seeing today? ... Can we stop emulating the people we see on television and the national

politicians? ... If we don't ratchet down the emotion and negative qualities, we will do serious damage." (Source: *The Salt Lake Tribune*, May 11, 2014; December 9 and 21, 2015)

Alberta Designates Castle Provincial Park and Wildland

Culminating a four-decade debate over the fate of the mountains between Canada's Waterton Lakes National Park and Crowsnest Pass along the Continental Divide, Alberta's minister of the environment announced the designation of Castle Provincial Park and Wildland. Formerly known as the Castle Special Management Area, the new protection covers 257,000 acres (100,000 ha) northwest of Waterton, along Alberta's border with British Columbia. Waterton itself encompasses only 125,000 acres (50 ha), while Montana's adjoining Glacier National Park contains 1 million acres (405,000 ha).

The Castle lands were originally part of Waterton Lakes National Park when it was established in 1895, 15 years before Glacier National Park was created in the United States, but in 1921 the Canadian federal government carved the Castle area off and gave it to the Alberta provincial government as a game preserve. The mountains around Castle Peak hold the headwaters of the Saskatchewan River drainage, which provides 30% of Alberta's and Saskatchewan's freshwater. They also provide an important corridor for wildlife that moves between the prairie and the peaks.

Some of the Castle designation has become an Alberta provincial park, while about 60% of the land base is now a wildland park. The provincial park encompasses preexisting recreation areas and is oriented toward front-country activities, picnicking, and cross-country skiing. The wildland park, on the other hand, provides a fuller backcountry experience and allows only limited development. (Source: *Missoulian*, September 16, 2015)

Ninth Circuit Court Upholds Tongass Roadless Rule

The Ninth US Circuit Court of Appeals has decided to keep roads out of the roadless areas of the Tongass National Forest in Alaska, over the objections of the state and timber industry, which had challenged the roadless rule and its restrictions on logging. Timber harvests in the Tongass, the nation's largest national forest, once supported two huge pulp mills along with sawmills and exports. The only remaining large lumber mill is Viking Lumber on Prince of Wales Island.

The Alaska Forest Association says the roadless rule, adopted during the Clinton administration, should never have applied to Alaska. The George W. Bush administration agreed and exempted the Tongass from the nationwide rule. When the Obama administration chose not to defend the exemption, the state of Alaska took up the defense, winning a short-lived victory when a three-judge panel of the Ninth Circuit Court sided with the state on a 2–1 vote. But in August 2015, that victory was vacated when a full 11-judge panel reinstated the roadless rule on the Tongass on a 6–5 vote.

Logging in the Tongass has dropped dramatically in recent years. Even while the forest was exempted from the roadless rule, the US Forest Service focused its timber sales on areas not covered by the rule. Owen Graham, executive director of the Alaska Forest Association, said the only possibility of appeal would be to the US Supreme Court, if it would agree to hear it. According to Graham, the roadless rule never should have been applied to a national forest in Alaska because the Alaska National Interest Lands Conservation Act (ANILCA) prohibits "locking up" additional land. (Source: *Alaska Dispatch News*, July 29, 2015)

Pentaceratops Leaves the Bisti Wilderness, Respecting the Wilderness Act

The full skeletal remains of a baby *Pentaceratops*, a plant-eating dinosaur with large horns that once roamed what is now North America tens of millions of years ago, were discovered in 2011 in New Mexico's Bisti Wilderness by paleontologists from the New Mexico Museum of Natural History and Science. Fewer than 10 adult *Pentaceratops* skulls have been unearthed over the past century, and this find is the first baby skeleton and skull to be recovered. With other dinosaurs, researchers have found the shape of skulls can change dramatically from adolescence to adulthood.

A National Guard Blackhawk helicopter plucked the baby's skull, encased in plaster, from the wilderness and airlifted it to a waiting cargo truck. The team also airlifted the skull of an adult *Pentaceratops* that was located 10 miles (16.1 km) away. Because crews were working within designated wilderness, no vehicles or mechanized equipment were used on the ground. Hundreds of pounds of plaster were packed in, along with countless jugs of water and a battery of heavy tools. The mission was mostly a success. Muddy conditions prevented the team from transporting a third and final plaster jacket that contains the remainder of the baby's skeleton. That will happen at a later date. (Source: The Associated Press, October 30, 2015)

2015 Was a Banner Year for Ocean Protection

More than 1 million square miles (260,000 ha) of highly protected ocean were set aside in 2015, more than during any prior year, according to the Pew Charitable Trusts. The Pacific island nation of Palau designated a 193,000-square-mile (50,000 ha) fully protected marine reserve that became the sixth largest such area in the world, safeguarding more than a thousand species of fish and some 700 species of coral. The single largest marine reserve ever created – the Pitcairn Island Marine Reserve, at 332,000 square miles (86,000 ha) – was dedicated by Britain in 2015, joining New Zealand's Kermadec Ocean Sanctuary (239,000 square miles/62,000 ha), Chile's Nazca-Desventuradas Marine Park (115,000 square miles/30,000 ha), and the proposed Easter Island reserve (244,000 square miles/63,000 ha). The Easter Island reserve, supported by Easter Island's indigenous Rapa Nui people, has not yet been finalized.

Palau, located in the Western Pacific Ocean off the Philippines, was formerly a trust territory of the United States; it became independent in 1994. The nation's new marine reserve has several unique aspects to it. The country is protecting fully 80% of its waters – an unusually high percentage. The remaining 20% is a zone reserved only for local fishing and some other relatively small-scale nonindustrial harvesting. And Palau also created the world's first shark sanctuary in 2009.

According to a 2009 study published by researchers at the University of California–Santa Barbara, Oregon State University, and the National Marine Fisheries Service, no-take reserves on average produce four times as much fish as unprotected areas. These fish are 25% larger and produce many more offspring, which in turn migrate to neighboring areas where fishing is allowed. (Source: *The Washington Post*, October 23, 2015)

Continued from WILDERNESS MANAGEMENT DISTANCE EDUCATION PROGRAM, page 34

Cordell, Watson, and Dawson 2015). The *2020 Interagency Vision* (Wilderness.net 2015) also prioritizes fostering relevancy of wilderness to contemporary society by inspiring and nurturing lifelong connections between people of diverse cultures and wilderness. Thus, education is one of the most effective tools in managing wilderness, and wilderness management distance education is one tool in the toolbox to help achieve this goal. A quote from an alumnus of the WMDEP graduate certificate summarizes it best:

> I consider graduation from the WMDEP program among the most important (and treasured) accomplishments in my professional career. It has connected me with wilderness, other professionals, and helped me understand how to talk about wilderness to our decision makers and the public so that it is clearer to them why our actions (or lack thereof) in wilderness are important.

For more information on WMDEP, visit our website at: http://www.cfc.umt.edu/wmdep/default.php

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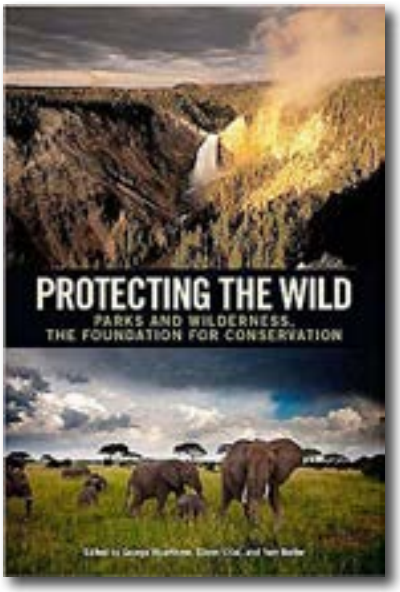
Book Reviews

Defending Wilderness Conservation from the "New Conservation"

JOHN SHULTIS, BOOK REVIEW EDITOR

Protecting the Wild: Parks and Wilderness, the Foundation for Conservation

Edited by George Wuerthner, Eileen Crist, and Tom Butler. 2015. Island Press, Washington, DC. 392 pp. $24.95 (pb).



Nature™ Inc. : Environmental Conservation in the Neoliberal Age

Edited by Bram Büscher, Wolfram Dressler, and Robert Fletcher. 2014. University of Arizona Press, Tucson. 304 pp. $60.00 (hc).

Since the mid-2000s, the traditional use of protected areas as the primary form of global conservation of biodiversity has come under increasing criticism. In addition to the earlier criticisms of the wilderness concept from a relativist perspective (e.g., William Cronon's work), some researchers and global conservation agencies began to expand on these challenges to wilderness conservation by suggesting that, inter alia, (1) the use of protected areas for conservation has been a failure, and new approaches were needed; (2) there is no such thing as wilderness (untouched natural areas) left in the world, so conservationists should see themselves as "gardeners" of working, modified landscapes; and (3) the concept of ecosystem services (championed by the United Nations) and the associated use of market-based approaches to preserve these services should be the focus of the "new" conservation. These and related criticisms of contemporary wilderness and global conservation were discussed in *Keeping the Wild: Against the Domestication of Earth*, a previous companion of *Protecting the Wild*, the first book reviewed here.

Protecting the Wild provides a wide-ranging, passionate defense of the success of wilderness preservation as the optimal approach to protect the Earth's biodiversity. A mix

of original and previously published articles from a similarly broad range of conservationists (mainly from the natural sciences camp), this book provides a selection of criticisms of this new vision for global conservation. One common theme mentioned by several authors is the futility of the ecosystem services approach in focusing on the material/economic values of the environment, when these material values can shift over time and reflect only a very limited perspective of the nonmaterial value of protected areas and nature. In a related manner, the further commodification of nature through the "new conservation" is exceedingly anthropocentric, only including human values and perspectives. As Emily Wakild notes, "The problem with conservation losing its credibility is that we don't have a model to replace it that speaks for the nonhuman silence. The world will be impoverished if parks are not sustained, expanded, and functionally connected into networks of conserved lands that support biodiversity and natural processes" (p. 52). The hope expressed is that "the arc of the moral universe bends towards justice" (p. 91), and the next step of conservation – termed "compassionate conservation" – will embrace a form of social justice that includes nonhumans.

Eileen Crist's chapter was a patrticularly moving synopsis in defense of the need to retain and expand the so-called fortress conservation via the creation of inviolate protected areas. Like many other authors in this book, she acknowledges the tension between exclusionary and inclusionary models of protected areas, recognizing the need to have community-based forms of conservation in addition to "traditional" fortress protected areas. But in the end, a revolution in spirit is required: "Parks, wilderness, and other nature reserves are biodoversity arks, protected for Earth's future restoration into wholeness when humanity will desire to be interwoven within Nature's expanse rather than establishing an imperial, parasitic civilization upon it" (p. 92).

The second book, *Nature™ Inc.*, focuses on critiquing the neoliberal principles and practices that are the primary forces behind the rise of the call for market forces in the "new conservation." It offers a number of case studies and critiques reflecting three main themes: (1) neoliberal forces such as commodification, competition, and "market discipline" articulate with conservation to create novel social and natural changes; (2) neoliberal discources and representations help legitimate and "sell" these novel relations between human and nonhuman natures; and (3) the mechanisms that transcend conservation allow for the circulation of "natural capital" in an increasingly global economy. The basic premise is that "as public funding for conservation grows scarcer and organizations increasingly turn to the private sector to make up the shortfall, market forces have found their way into conservation policy and practice to a degree unimaginable only a decade ago" (p. 4). In addition, "Considered together, these dynamics have produced a truly global conservation frontier: a suite of networks, activities, and regulations that are rapidly changing the relations between people and nature worldwide" (p. 5).

As the principles and practices of neoliberalism have been largely unquestioned, hegemonic forces in global society, conservation has become increasingly entangled within its sphere of influence. "Selling nature to save it" (p. 9) has become the clarion call of the "new conservationists." Perhaps the main unanswered question is, how can capitalist market forces that create environmental destruction and exacerbate existing inequalities both destroy and save nature and local communities at the same time? Ecotourism, payments for ecosystem services, and new conservation finance instuments such as species and ecosystem banking and carbon trading are touted as the only way to save nature, as wilderness preserves have supposely failed to do so.

*NatureTM Inc.*will be a more challenging read for wilderness researchers, as the 12 chapters usually take a constructivist perspective using an interdisciplinary lens from the social sciences. The case studies suggest that "social and natural relations embedded in the land and lifeways become hollowed out and refurbished within and through market mechanisms" (p. 246) to create a global circulation of natural capital. This movement of capital, as all neoliberal practices, tends to exacerbate inequality, shifting capital "upward" (i.e., to the elite) rather than "downward" (i.e., to communities or nonhuman populations).

Both these books highlight the need to question the "taken for granted" promise of neoliberal approaches to conservation, take into account nonhuman species and processes, and champion alternative visions for the global preservation of wilderness. The "new conservation" is the most critical challenge currently facing wilderness conservation.

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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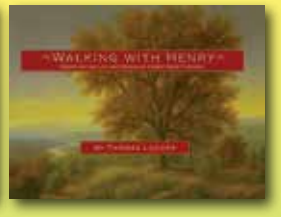

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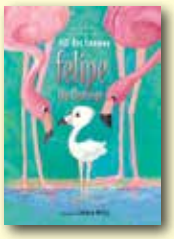

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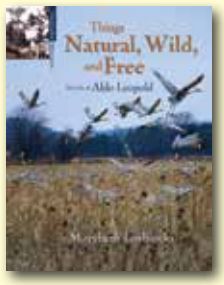

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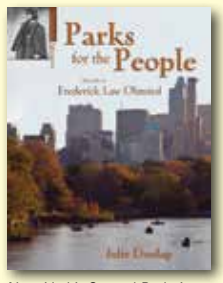

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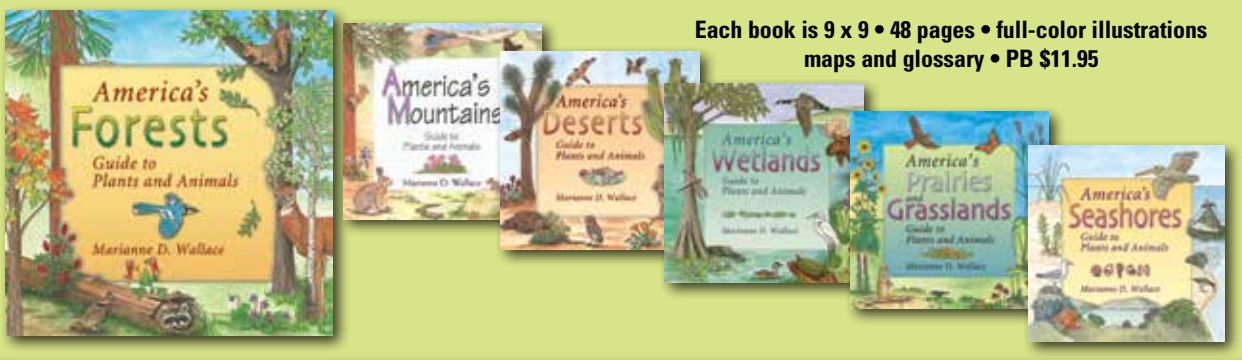

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