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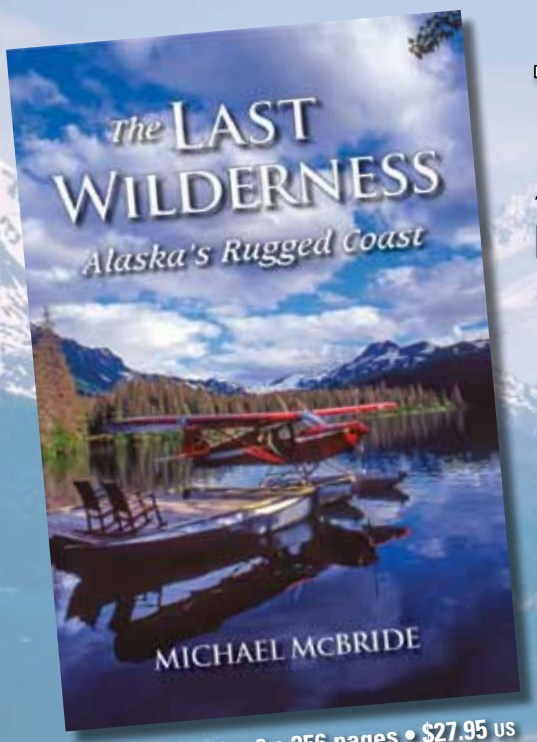
In This Issue

- Wilderness Character
- Wildlife and Wilderness
- Antarctica
- Germany

DECEMBER 2013 VOLUME 19, NUMBER 3



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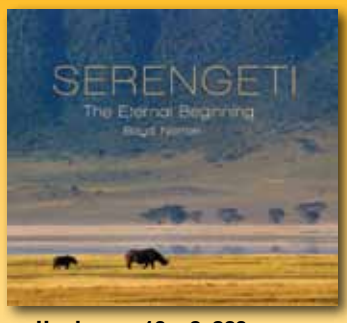

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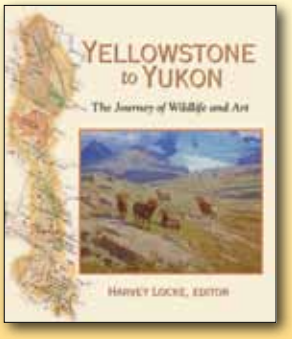

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On the Cover

Las Batuecas, Spain: In Celebration of Rewilding Europe. Artist rendering – using Maya Jungle Ink on 300 gr. cotton paper, 22.5 x 30 inches (57 x 76 cm) – by **Beatriz Padilla** (pictured inset), Mexican conservation artist activist and exhibitor/delegate at WILD10, the 10th World Wilderness Congress (Spain, October 2013) **www.wild10.org**. Ms Padilla created this on a field trip following WILD10 and as part of her multi-year, Wilderness Conservation Painting Expeditions **http://beatrizpadilla.org/english/index.html**. (Artwork courtesy of Beatriz Padilla, and photographed by Enrique Torres Agatón)

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

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.

International Journal of Wilderness (IJW) publishes three issues per year (April, August, and December). *IJW* is a not-for-profit publication.

Manuscripts to: Chad P. Dawson, SUNY-ESF, 320 Bray Hall, One Forestry Drive, Syracuse, NY 13210, USA. Telephone: (315) 470-6567. Fax: (315) 470-6535. E-mail: cpdawson@esf.edu.

Business Management and Subscriptions: The WILD Foundation, 717 Poplar Ave., Boulder, CO 80304, USA. Telephone: (303) 442-8811. Fax: (303) 442-8877. E-mail: info@wild.org.

Subscription rates (per volume calendar year): Subscription costs are in U.S. dollars only—Online access $35; online access and printed journal $50; online access and printed journal (Canada and Mexico) $62; online access and printed journal (international) $74. We do not offer an agency discount price. No refunds.

ISSN # 1086-5519.

Submissions: Contributions pertinent to wilderness worldwide are solicited, including articles on wilderness planning, management, and allocation strategies; wilderness education, including descriptions of key programs using wilderness for personal growth, therapy, and environmental education; wilderness-related science and research from all disciplines addressing physical, biological, and social aspects of wilderness; and international perspectives describing wilderness worldwide. Articles, commentaries, letters to the editor, photos, book reviews, announcements, and information for the wilderness digest are encouraged. A complete list of manuscript submission guidelines is available from the website: www.ijw.org.

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EDITORIAL PERSPECTIVES

Connecting People and Place

BY REBECCA ORESKES

There are many definitions of wilderness, and perhaps each of us has our own, sometimes deeply private definition. Part of wilderness for me embodies treating the land with a deep ethical sense of gratitude. I love the idea of self-willed land – to the extent it's possible in a world so full of anthropogenic change; I also love the idea of people connecting to the land and to wilderness.

Many years ago, a friend and I started working on what turned out to be a long project. We interviewed people who had been important to the White Mountains of New Hampshire, capturing their stories so that other people could enjoy them. We thought we would pull together some quaint mountain tales not realizing that 20 years later these interviews would lead to a book, *Mountain Voices* (Mayer and Oreskes 2012), and to capturing a legacy of our shared commitment to place.

Not everyone we talked to was a dedicated wilderness advocate. Some folks devoted themselves to human-made tourist attractions, others to mountaineering, trail tending or exploration. But George Zink was committed to wilderness. He was often called the "Father of the Sandwich Range Wilderness" because he fought tirelessly to have this small piece of the White Mountains added to federally designated wilderness. Most of all, George was committed to the idea that humans must move toward an earth community in which we are "not man-centered, anthropocentric, but ecocentric, intimately interconnected with all life forms…We are related to all life forms and the resources upon which all life forms are dependent" (Mayer and Oreskes 2012, p. 74).

Guy and Laura Waterman spent many years trying to get people to think about what it means to have wild land, with or without an official designation. What makes a place wild? Do our cell phones and radios (they were writing before iPads and Google glasses!) take something away from the experience of wildness? How about helicopters and the way we build trails?

Maybe what I loved best about the 20 years we spent talking to people about the mountains was not that everyone agreed or that we walked away with simple answers to complicated questions such as what wilderness is, but rather that we made human connections, all of us held together by our love for the land.

Is wilderness important because it forces humans to exercise restraint or because it's wild and untrammeled? Is the idea of wilderness a social construct or something innate? Whether you prefer your own definition of wilderness or the text of the 1964 US Wilderness Act, what is important is not that we have clear answers but that we keep asking the questions, keep talking to one another and most of all treat the land with humility and respect.

George Zink and Guy and Laura Waterman – and countless others – are all part of a conversation about the Earth and our responsibility to it. I hope the conversation never ends and that the conversation leads to action.

In this issue of *IJW*, Frederick H. Swanson recounts how Olaus Murie contributed to the defense of wild places and Tina Tin and Rupert Summerson outline how wilderness is diminishing in Antarctica. Two feature articles explore human and wildlife interactions in wilderness and another two feature articles discuss wild nature in European cities.

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SOUL OF THE WILDERNESS

Olaus Murie and the Defense of the Wild

BY FREDERICK H. SWANSON

It is no small irony that as the Wilderness Act nears its 50th anniversary, the notion of protecting wilderness is more fraught than ever – dismissed by some as a "received idea" with little meaning in a world that is everywhere influenced by humans, and rejected as well by its traditional foes in the forest products, mining, ranching, and motor sports communities. Scholars from Roderick Nash onward have attributed the wilderness idea to the Romantic-era concept of a sublime, unchanging natural world that is separate from humans (Nash 2001). More recently, scholars have asserted that the idea of protected wilderness "has been and remains a tool of androcentrism, racism, colonialism and genocide" (Callicott 2000). It is claimed that because of its ties to the Romantic notions of previous centuries, current wilderness policy "no longer fits with a dynamic scientific and cultural understanding" (Burkhardt, Carroll, and Lawhon 2012).

Despite these critiques, the fact remains that during the last half-century, the U.S. Congress has seen fit to designate 757 such areas as wilderness, an indication of lasting public support for the wilderness idea, however construed. Might it be useful, therefore, to look once again at the thinking of those individuals who made the Wilderness Act possible? Aldo Leopold, Bob Marshall, and Howard Zahniser played major roles in the genesis of the act and are the subjects of fine biographies, but less well known are the contributions of Olaus J. Murie, the renowned naturalist who died in October 1963, just as the final version of the Wilderness Act was taking shape (Glover 1989, 2003). Murie's work as The Wilderness Society's spokesman in the western states complemented Zahniser's role as author and chief lobbyist for the act. Olaus and his wife Margaret ("Mardy") brought thousands of Americans to a better appreciation of wild animals and their need for protected habitat (see Figure 1). Olaus's presence at dozens of public hearings and meetings in the 1940s and 1950s encouraged citizens to write to Congress in support of a wilderness law. A gentle and somewhat shy man who thought deeply about the importance of wild country in our lives, his speeches and writings display a keen awareness of ecological principles and suggest that the preservation movement in the United States was grounded on something more robust than Romantic naturalism.

Author photo: Frederick H. Swanson. Photo by Bessann Swanson.

An Elemental Response

Nature and wildness were no abstractions for this veteran scientist and outdoor traveler. Born of Norwegian parents in rural Minnesota, Olaus and his half-brother Adolph exemplified the spirit of *friluftsliv* ("life in the open air"), which is still prized in Scandinavia. A 25-year career as a field researcher with the U.S. Biological Survey took Olaus to Alaska and the least-developed parts of the Rocky Mountains (see Figure 2). His studies of big game and predators in their wild habitats gave him a breadth of experience unequaled among preservation activists. His field notes record not only the prosaic habits of birds, caribou, wolves, elk, coyotes, and their many wild companions but also behaviors he clearly found delightful. In 1944, while working in Yellowstone National Park, he observed a band of elk "which obviously felt the exhilaration in the air which comes with a lowering sun in spring. They milled around, ran off in sudden stampedes … shaking their

heads and leaping in a zig-zag manner, just feeling good" (Murie 1951). Although this could be regarded as anthropomorphism, Murie seemed more interested in breaking down the boundaries imposed by objective science. Noting how elk bugled more often on bright moonlit nights, he offered that "man himself is subject to these influences that do not necessarily involve his intelligence but perhaps his more elemental responses." These are not the statements of a Cartesian dualist who placed man in contradistinction to nature. They instead express his heartfelt desire for a closer relationship to wild creatures – to heal the breach, if only partially, between the human and the wild.

The British naturalist Frank Fraser Darling observed that Murie was no sentimentalist when it came to the workings of nature (Darling 1956). He trapped and shot animals, both for his studies and for meat. He sought not to enshrine Bambi in the woods but rather simply to allow wild creatures the freedom to live as they always had. This meant leaving part of the national forests and national parks as refuges from development – free from inundation by reservoirs, harassment from road hunters, or loss of vital nesting and breeding habitat. He expressed this as a form of generosity, which involved granting wildlife "some portion of the earth's surface, equipped with at least some share of their ancestral environment, in which to live their accustomed life." This "generous spirit," as he called it, extended to the hunter who exercised restraint in the take, the farmer who was willing to tolerate some losses from raptors and rodents, and the forester who could accept some damage from insects and fire (Murie 1937, 1947).

Yet Olaus accorded humans a place in nature as well, whether as aboriginal hunters such as the Inuit he met in Canada and Alaska, or city dwellers who sought respite in the woods. Murie himself seemed to need the feel of the earth underneath him. In 1940, while inspecting forestlands west of Yellowstone National Park, he got into a heated debate with a forest ranger who favored opening wilderness areas to easier access. Tired of arguing, Murie wandered off to collect his thoughts. He lay down on the forest floor and noticed "a little company of twinflowers, drooping [blossoms] two by two, pink and white" (Murie 1940). He thought about the hordes of tourists who sped by on paved highways, never stopping to admire such delicate beauty.

Figure 1 – Mardy and Olaus Murie at their home in Jackson Hole, Wyoming. Photo courtesy The Murie Center Archives, 2010.3.3.

Figure 2 – Olaus Murie in the Teton Wilderness Area, 1952. This Forest Service–administered wilderness, located adjacent to Grand Teton National Park, was a favorite of Murie's for ecological study. James P. Gilligan photo, courtesy U.S. Fish and Wildlife Service.

How could he answer the ranger who insisted on catering to them? He felt discouraged by the task.

Five years later, Murie quit his job with the Biological Survey after a long-running dispute with its administrators over predator-control policy. Seeking a wider audience, he accepted a half-time position as the director of The Wilderness Society, then a small, elite organization of dedicated conservationists. As the group's only staff person in the West, he traveled to numerous conferences, public hearings, and private meetings with outdoors people to promote the wilderness concept. Murie warned his colleagues that if they remained merely "a group of mutually agreeable enthusiasts for wilderness" they would lose many threatened places. What was critical was the "mobilization of good people everywhere who instinctively value the wilderness concept, but who need to be aroused and shown the way" (Murie 1946).

Murie's stature as a field biologist gave him credibility with wildlife, hunting, and outfitting groups, which formed much of the constituency for wilderness in the 1940s and 1950s. He drove home the point that wilderness areas could provide needed habitat for creatures such as elk, moose, grizzly bears, wild trout, and salmon. At a hearing held in Kalispell, Montana, in 1948 to consider the proposed Glacier View Dam on the North Fork of the Flathead River, which threatened to flood a small part of Glacier National Park, Murie pointed out that more than scenery was at stake: the reservoir would inundate "practically all of the present winter range of moose, elk, and white-tailed deer in the northwestern portion of the park" (Murie 1948a). Thanks to the outcry from local sportsmen, the dam was never built, and the Flathead's upper reaches were later added to the National Wild and Scenic River System.

Man at a Crossroads

Faced with numerous proposals to open wild areas to power reservoirs, logging roads, and ski developments, Murie, Zahniser, and colleagues such as the Sierra Club's David Brower realized that they must obtain permanent protection under federal law for such areas. In 1949, The Wilderness Society's governing council endorsed Zahniser's proposed legislative campaign for a federal wilderness law (Scott 2004). Murie initially expressed reservations about devoting the society's limited resources to this grueling and divisive battle, pointing out the need to educate more Americans about the values they were trying to protect (Harvey 2005).

Nature and wildness were no abstractions for this veteran scientist and outdoor traveler.

As it turned out, the eight-year legislative campaign for the act proved to be an ideal vehicle for public education. Olaus brought a unique gift to this task, placing his love for wild places and animals in a moral and spiritual context. "Mankind is at the crossroads today," he wrote in 1947. "He has suddenly emerged as the one animal in possession of the scientific know-how to change the face of the Earth. He has the power to shape his future habitat." He asked whether Americans' future would be "a wholesome one rooted in the soil, generously sharing with his evolutionary companions who are now at his mercy? Or shall it be one primarily rooted in the bank account, with its attendant bickering and strife and ultimate decay?" (Murie 1947).

Technological man was on a dizzying ascent following World War II, and while government agencies celebrated our growing dominion over rivers, forests, and farmland, Murie was convinced we were in danger of losing something elemental. He told a conference of conservation professionals in 1949 that they needed to conserve more than just lumber, forage, and water. There were other, intangible qualities in the public's land that "shape for us a pleasant living … give color to our experience and aid us in our well known 'pursuit of happiness'" (Murie 1949).

Murie's writings during this period professed an earnest hope that Americans were beginning to take a wider view than simply providing for their material wants. He told Forest Service chief Lyle Watts in 1952 that there was "an unrest in the nation, a determination among thinking people to rebuild America to something we can be proud of in the privacy of our consciousnesses, rather than on the Fourth of July platform" (Murie 1952). Leaving wild country intact would respond to this higher calling, but this required that the Forest Service move beyond its sawlog orientation. He noted how a forest ranger who accompanied him on a visit to the Three Sisters Primitive Area in Oregon looked with awe at a huge Douglas fir and reflexively computed the board feet it would yield. Murie (1952) reminded Watts that such forests held other values, and that wilderness areas needed to encompass more than "those timberless left-overs after the commercial groups have had their fill."

A Diverse and Resilient Wilderness System

The leaders of the American preservation movement during the 1950s

envisioned a wilderness system that encompassed more than sublime, treeless mountain vistas (see Figure 3). As Murie put it, wilderness areas also needed to include "open sage plains or desert cactus; the coastal rain forests, tropical jungles, or arctic tundra" (Murie 1949). Such areas needed to be large enough to permit migratory species to range freely and to permit "drastic changes in the native vegetation due to natural or accidental causes, such as fire" (Murie 1953). He observed that "we cannot speak of a static equilibrium in nature in the usual sense of those words. Yet we must be aware of the fact that nature has produced a certain sustained relationship that persists or keeps on recurring." By not managing such lands with the usual tools of forest and range management, they would "reveal to us the stages in succession and the adaptations that are in progress," he said (Murie 1953).

During the precedent-setting battle over placing dams in Utah's Dinosaur National Monument, Murie and his colleague Joseph Penfold of the Izaak Walton League noted that the wildlife found in parklands and wilderness areas "helps us to appreciate that the area is no spot in time quick-frozen for our entertainment, but rather a continuing evolution of which we too are an inescapable part" (Murie and Penfold 1955). Wilderness designations gave space for ecosystems to evolve on their own, unfettered by power reservoirs, highways, and intensive forest management. This understanding of wildlands as dynamic, evolving systems remains part of today's conservation lexicon (see Figure 4).

Space-Age Hubris

Today, with whitebark pines dying in the Rockies, wildfires surging throughout the West, and the seasons themselves changing in length and timing, where stands the idea of wilderness? The preservation advocates of the 1950s were familiar with this class of problem: with radioactive fallout circling the globe and a real possibility of worse destruction falling from the sky at any moment, many of them believed that human survival was at stake. "We are in a fever of almost hysterical emphasis on science as a material weapon," Olaus Murie told an audience of wilderness supporters in Seattle in 1958. The news media of the day was "full of urgency about building more and bigger and better weapons. Man has reached the point in evolution where he has absolute power to destroy himself and his world" (Murie 1958). The launch of *Sputnik I* the previous October had set off a paroxysm of fear among Americans who believed their country was falling behind the Soviets in science and technology. Murie, however, worried that in the rush to colonize space, we would sever our connection to the Earth itself. "At this moment," he said, man "sees himself poised on the moon or on some star, looking down condescendingly on the little blob of Earth whence he came." Olaus's personal nightmare was that we would come to worship the "great idol" of technological progress, under whose "concrete wings" we would seek shelter. By 1958 we had already started down that road. "Man has gotten far away from his beginnings, in the forests, in the marshes, in the tall prairie grass, in the mountain ravines," he told the Seattle conferees. "Man is still an animal. I am sure he cannot yet say goodbye to all his roots. He still needs wilderness … for Man is not going to get away from Earth right away, and he still has a lot of unfinished business on it."

Figure 3 – The Hilgard Basin in southwestern Montana typified the alpine terrain the Forest Service favored for wilderness designation. Olaus Murie called such areas "the timberless left-overs after the commercial groups have had their fill." Photo by K. D. Swan, courtesy USDA Forest Service, Northern Region archives.

Wilderness preservation amounted to an act of humility, a corrective to runaway techno-optimism. David Brower lamented to Murie in 1960 how experts in government applied scientific knowledge without understanding its consequences. Someone needed to "tell managers when to plea restrain their compulsion to

Figure 4 – View from McDonald lookout, Coeur d'Alene National Forest, Idaho, 1932. Olaus Murie and other preservationists believed that wilderness areas should be large enough to allow the free play of natural forces such as wildfire and insects. Photo by K. D. Swan, courtesy USDA Forest Service, Northern Region archives.

manage," Brower insisted. "For example, they can now argue that since Dr. [Edward] Teller's fallout is everywhere, they too must manage everywhere to try to offset what Teller has upset – leaving nothing unmanipulated anywhere" (Brower 1960). Brower, like Murie and Zahniser, believed that we needed to step back from our presumed mastery of the Earth's natural systems and allow some places to seek their own evolution. All three men would have been wary of the modern view that natural forces have been so compromised by climate change, control of wildfire, and encroachments on habitats that wilderness managers need to step in with active interventions. This ran the danger of overstepping our knowledge and becoming one more form of control.

Connected to Earth

Olaus Murie was but one voice for wilderness, and his views do not represent all of the meanings found in the wilderness idea. His was a broad and humanistic perspective, however – especially for a scientist. For Murie, wilderness permitted intimate, soul-renewing contact with all life. Such areas were not walled-off places of pristine nature or even strictly biodiversity preserves. Wild landscapes and wild creatures required room to live and evolve, but humans, too, needed close contact with those animals and their habitats. This would bring meaning to our lives and teach us forbearance and humility, he believed. Murie and his colleagues framed wilderness in a social context; their larger goal was to direct America's attention away from its normal obsessions – materialism, easy entertainments, space travel – and back to the land. Their quest had strong ethical and spiritual ramifications, and it neither romanticized nature nor depended on a static, unsullied ecology.

Wilderness, moreover, was but one aspect of a healthy and satisfying relationship to the Earth, according to Murie. He often derived intense pleasure from simply being in green and wooded places (see Figure 5). Following the 1948 hearing in Kalispell on the Glacier View Dam, he headed south toward Missoula along the west shore of Flathead Lake. It was a well-used rural area, not a wilderness, but to him the homes, resorts, and tourist establishments along the lake – even a fish hatchery he passed – testified to people's need for a little beauty in their lives. "I drove along slowly," he wrote afterward,

> relaxing from the tension of the 'Hall of Controversy.' I looked across the water to the snow-capped mountains, the green shores, the occasional home among the trees. The service berry was in full bloom everywhere. Tall original firs and Ponderosa pines were still here, the feathery foliaged limbs of larch, a profusion of lesser trees and shrubs. A violet-green swallow sat comfortably on the telephone wire. As the sun sank below the western mountains, I was conscious of the rich evening glow over a pleasant land, like a benediction. How fortunate we are – yet! (Murie 1948b)

Fortunate indeed – as are we today who benefit from the work of these farsighted individuals. The framers of the Wilderness Act understood that one law could not meet all of what we need in the way of a land ethic, but in calling for a closer and more generous relationship to wild nature, they made a powerful beginning.

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Figure 5 – On the trail to Greywolf Lake, Mission Mountains Wilderness, Montana, 1964. Thad Lowry photo, courtesy USDA Forest Service, Northern Region archives.

Growing Human Footprint, Diminishing Wilderness in Antarctica

BY TINA TIN and RUPERT SUMMERSON

The Last Great Wilderness

Antarctica is the only continent without indigenous human inhabitants and where humans are unable to survive without technological support. Up until the late 18th century, Antarctica and the surrounding Southern Ocean were entirely wilderness, whether wilderness is to be defined as "an uncultivated, uninhabited, and inhospitable region" as in the *Oxford English Dictionary* or in the 1964 U.S. Wilderness Act as "an area where the earth and its community of life remain untrammeled by man, where man himself is a visitor who does not remain … retaining its primeval character and influence, without permanent improvements or human habitation." Humans first set foot on the Antarctic continent in the early 19th century. Sealers came to harvest the abundant fur seals and elephant seals. As seal populations declined, commercial interests turned to whaling, and shore-based whaling stations were constructed on a number of islands around the continent. During the "Heroic Age," – the period roughly between 1895 and 1922 – parties from different nations engaged in the geographical exploration and scientific study in different parts of the Antarctic continent. The first recorded construction of a building on the continent was in 1899 by the Borchgrevink expedition (Headland 2009).

Tina Tin in the French Alps.

Rupert Summerson while sailing around Tasmania.

Growing Human Footprint, Diminishing Wilderness

During and after the Second World War, the number of regular annual national expeditions to the Antarctic increased as the continent's geopolitical and strategic importance came to the forefront (Klotz 1990; Headland 2009). Human presence on the Antarctic continent expanded significantly during the 1957–1958 International Geophysical Year (IGY). Fifty-four research stations operated in Antarctica and the peri-Antarctic islands during the winter of 1957 (Headland 2009) to support international cooperative research programs undertaken by the 12 countries in the Antarctic during the IGY (see Figures 1a, 1b, 1c).

Today, there are 81 research stations that are in use, of which 40 are occupied all year and 41 are occupied only in the summer. On average, one to two new stations have been built each year in the last two decades (COMNAP 2012). In addition to the stations, more than 550 items of infrastructure are standing in Antarctica today (see Figure 1) (Summerson 2012). These include aircraft runways, field camps, abandoned stations, field huts, refuges, scientific equipment, historic sites and monuments, depots, and other miscellaneous objects. This estimate is based on information publicly available on the websites of National Antarctic Programs and the Antarctic Treaty Secretariat and hence by no means represents a complete picture.

Technological advances are allowing stations and research activities to reach farther into remote parts of Antarctica. New stations are built in previously unoccupied areas. Stations and field camps are used as bases to access more remote locations (Hughes et al. 2011; Pertierra et al. 2013). A number of projects have drilled through the several-kilometer thick ice sheet in the interior of the continent, including the penetration of pristine Lake Vostok, lying below nearly 4,000 meters (13,123 ft.) of glacial ice (Masson-Delmotte et al. 2011; Lukin 2012).

Although the most persistent and widespread human presence in Antarctica arises from national Antarctic programs and their associated logistics, commercial tourism is now the single activity that brings the largest number of people to Antarctica each year. Regular Antarctic tourism started in the late 1960s, when the first commercial tourist cruises to Antarctica in small ships carrying between 50 and 120 paying passengers were organized (Stonehouse and Snyder 2010). During the past two decades, tourist numbers have grown exponentially, from a few thousand to a peak of around 45,000 in the 2007–2008 season (Crosbie and Splettstoesser 2012). The majority of Antarctic tourism is ship based with more than 90% of tourists visiting Antarctica on cruise vessels, mostly between November and March. Most tourists visit the northern Antarctic Peninsula, normally landing at a small number of well-known locations in rapid succession. Landings are highly concentrated at specific sites (Lynch et al. 2010). For every 10 paying passengers, there are an additional six members of staff and crew. Antarctic tourism is also diversifying, which means that tourists now have access to a greater range of destinations

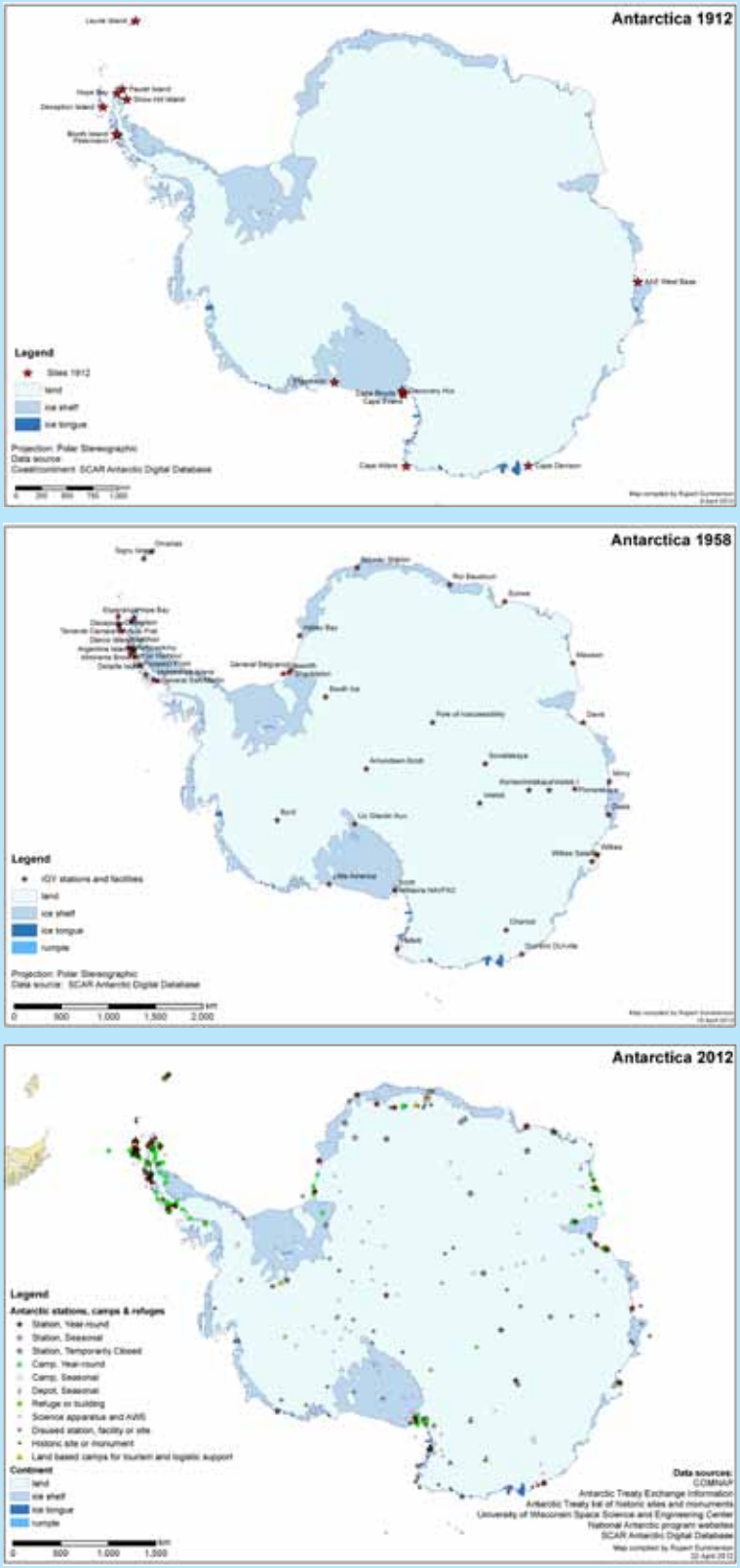

Figure 1 – The increase of fixed infrastructure linked to human activity in Antarctica during 1912 (a), 1958 (b), and 2012 (c). Data sources: Council of Managers of National Antarctic Programs (COMNAP, 2012), Antarctic Treaty Secretariat's list of historic sites and monuments, Antarctic Treaty Information Exchange (both accessed via www.ats.aq), Antarctic Meteorological Research Center and Automatic Weather Stations Project (amrc.ssec.wisc. edu), National Antarctic Program websites, and tourism websites. Accuracy of data provided by data sources was not confirmed.

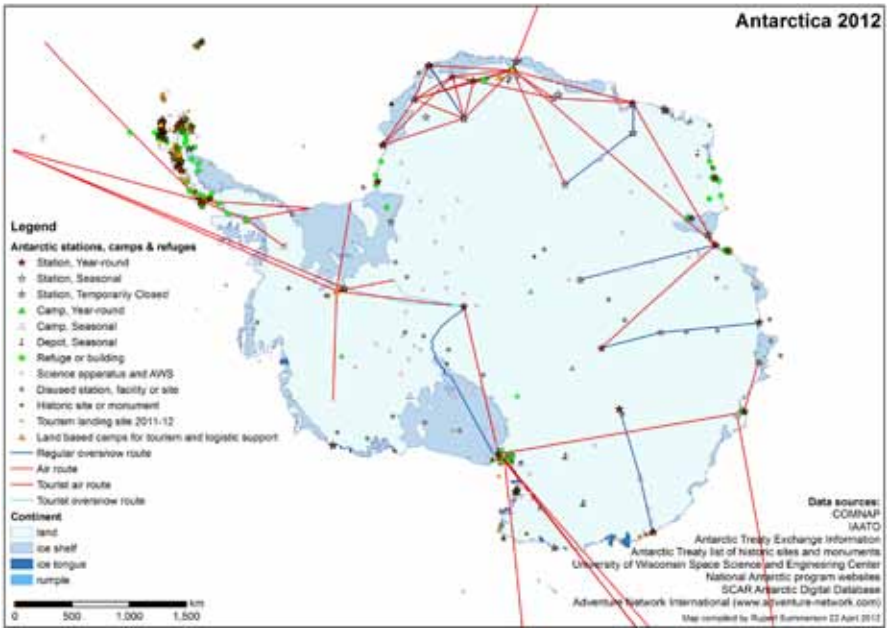

Figure 2. Human activity in the Antarctic in 2012. Not all human activities that take place in Antarctica are marked on the map; for example, trajectories of individual field parties, routes of marine vessels, and helicopter routes are not shown. Data sources: same as Figure 1; COMNAP Antarctic Flight Information Manual, International Association of Antarctica Tour Operators (www.iaato.org); Adventure Network International (www.adventure-network.com); and McMurdo–South Pole over-snow route digitized from LaRue (2008). Other over-snow routes were inferred. Accuracy of data provided by data sources was not confirmed.

and can participate in a more diverse selection of activities (e.g., kayaking, mountain climbing, scuba diving) than ever before. Some land-based tourism infrastructure already exists in the form of tourist accommodation supported by a national Antarctic program or base camp and support facilities run by commercial entities (Tin et al. 2014). By any definition, the Antarctic wilderness is diminishing as the human footprint – both permanent and transient – expands (see Figure 2).

Protecting Antarctica's Wilderness: A Promise

In 1991, the Consultative Parties to the Antarctic Treaty signed the Protocol on Environmental Protection to the Antarctic Treaty. The protocol banned mining and designated Antarctica as a "natural reserve, devoted to peace and science." It further stipulated that

> The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, including its wilderness and aesthetic values and its value as an area for the conduct of scientific research, in particular research essential to understanding the global environment, shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area. (Article 3(1))

The protocol gave a first promise that Antarctica's wilderness could be, should be, will be protected. It came into force in 1998 and set up a Committee on Environmental Protection (CEP) as an expert advisory body to provide advice and formulate recommendations to the Antarctic Treaty Consultative Meeting in connection with the implementation of the Protocol. During the past 15 years, the CEP has met every year. It has discussed, decided, and provided guidance on an increasing number of issues (Orheim et al. 2011). Little progress has been made in implementing the protection of Antarctica's wilderness values, however (Summerson and Bishop 2012; Tin and Hemmings 2011). In 2010, "footprint and wilderness values" finally became an official item on the CEP's agenda (CEP 2009). The CEP "acknowledged that there had been gradual degradation of some aspects of Antarctic wilderness." It aims to reach an agreed understanding of the terms *footprint* and *wilderness* and develop methods for improved protection of wilderness through the designation of protected areas and Environmental Impact Assessments (CEP 2012).

As Antarctica becomes warmer and busier, researchers have warned about challenges to the future conservation of the Antarctic (Chown et al. 2012), have demonstrated that current environmental management practices are not preventing environmental degradation in some places (Peter et al. 2013), and have concluded that current environmental management practices are unlikely to protect the Antarctic environment in a business-as-usual future (Tin et al. 2014). They have shown that the Antarctic wilderness is under pressure (Tin et al. 2008), and pristine areas, even in Antarctica, are becoming a diminishing resource (Hughes et al. 2012).

Antarctica has always awed and inspired humans. The awe has come from not only Antarctica's vast, frigid spaces but also from the stories of how humans have related to the frozen continent and to each other, in the face of daunting challenges. The Antarctic Treaty was signed in 1959 at the height of the Cold War. Twelve countries agreed to set aside their territorial claims and commit to setting a whole continent – often many times the size of their own countries – aside for peace and science, "in the interest of all mankind." In 1991, 26 coun-

tries signed the protocol, committing their countries to the comprehensive protection of the environment of a region, covering one-sixth of the planet's surface (region south of 60 degrees latitude south). Today, more than two decades later, calling for the limitation of the human footprint and taking concrete measures to value and protect Antarctica's wilderness follows seamlessly in the audacious and ardent footsteps of the Antarctic Treaty and the protocol. Setting limits to the expansion of all human activity in Antarctica, regulating tourism and other commercial activities, minimizing greenhouse gas emissions from human activity within and outside Antarctica are all concrete, necessary – if ambitious – steps that humanity, especially the Antarctic Treaty parties, need to take to ensure the continued protection of Antarctica's wilderness and biodiversity in the face of growing pressures and global changes of the 21st century.

A hundred years ago, the idea of setting a whole continent aside for peace and science and where the protection of the environment is a "fundamental consideration" may have seemed, at least to some people, a ludicrous and unthinkable enterprise. Yet in Antarctica, humans have demonstrated that we are capable of transcending our personal, national, and cultural boundaries. We can believe that we can take on a planetary perspective; that we can be willing not to dominate, use, or own every piece of land and ocean resource; that we can bear the idea of letting the "other" – society, species, or place – exist as they have always done so before our species' arrival and long after our departure. The existence of a real place where a better version of ourselves prevails – therein lies the promise of the protection of the Antarctic wilderness.

Antarctica is the only continent without indigenous human inhabitants and where humans are unable to survive without technological support.

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Continued on page 36

Commonality in Wilderness Character

A Personal Reflection

BY NYSSA LANDRES

Walking across the ridge in an Alaskan wilderness my boots sank into spongy lichens; rivers crept through the plains below me with meanderings so wide the river snaked back on itself. I could see in every direction until clouds shrouded the distant mountains. The landscape looked untouched, exactly as I imagine it would've been 100 years ago. Less than two weeks before, I was spending my time in the recommended wilderness of Cedar Breaks National Monument in Utah where I walked past visitors wearing flip-flops and shorts, cameras in hand as they emerged from their cars to reach the wilderness. As I descended, the sights and sounds of people would fade away until all that was left were the sounds of water against rocks curling through a maze of ochre canyons.

The two places described above are both managed as wilderness, but how could places that are so different both be considered wilderness? The answer lies in wilderness character: the unique features that create a personality for each area that make each place, *that place*.

Wilderness character is the thread that ties all wilderness areas together and must be preserved in each as prescribed by an affirmative mandate in the Wilderness Act of 1964 (Public Law 88-577). But how does wilderness character inform our understandings of what is considered wilderness? I have three intentions in this reflection: first, to illustrate how wilderness character applies to all wildernesses; second, to show that each wilderness is unique; and third, to show how wilderness character is a common framework in which to understand the unique features of each wilderness. Through these three elements, we see the role wilderness character plays in wilderness preservation.

To do this, I have taken two wilderness areas I've spent time in and apply the concept of wilderness character to both. The reflection is based on my own experiences, conversations with park staff in both locations, and secondary outside research. One area is Gates of the Arctic Wilderness located within Gates of the Arctic National Park and Preserve, Alaska, and is often perceived as the epitome of wilderness. The second area is Cedar Breaks National Monument, Utah, which is recommended as wilderness (wilderness study area currently) and few people even know it exists. The National Park Service (NPS) manages both the wilderness and wilderness study area. These areas are very different as places but similar as wilderness, and the similarities in how they fit into the framework of wilderness character provides a window on how wilderness character applies to wilderness everywhere.

Nyssa Landres. Photo by Peter Landres.

Gates of the Arctic Wilderness

Gates of Arctic wilderness (hereafter referred to as "Gates") stretches across 7 million acres (2.8 million ha) of land above the Arctic Circle in Alaska's Brooks Range (see Figure 1). The wilderness is typically accessed by planes, which are allowed in the wilderness under the Alaska National Interest Land Conservation Act (ANILCA). Gates is located in a remote part of Alaska and is bordered by other federally managed lands and Native Corporation Lands. Gates is distant from most modern civilization, although the town of Anaktuvuk Pass lies within the park's boundaries. The nearest sizable city is Fairbanks, Alaska, which is more than 250 miles (402 km) away.

Cedar Breaks National Monument

Cedar Breaks recommended wilderness (hereafter referred to as "Cedar Breaks") comprises 4,370 acres (1,776 ha) in south-central Utah. The area is located within an amphitheater created by uplift, sedimentation, and erosion (see Figure 2). The local Paiute Indians called Cedar Breaks the "circle of painted cliffs" (Fertig 2009). Visitors typically need ropes to fully access many of the canyons within the amphitheater. Access to the wilderness is typically by foot via an adjacent wilderness area and is only practical seasonally. It is relatively close to modern cities, with state highways that run within one mile (1.6 km) of the wilderness on two sides and Cedar City less than 10 miles (16 km) away.

The Five Qualities of Wilderness Character

Wilderness character was formerly an ambiguous term but is now defined in terms of five qualities drawn from the Wilderness Act (Landres et al. 2008; NPS in press): natural, solitude or unconfined and primitive recreation, untrammeled, undeveloped, and other features of value. The purpose of the five qualities is to understand and preserve wilderness character. The five qualities of wilderness character also create a common framework in which the wilderness character of all wilderness areas can be uniquely evaluated.

The five qualities of wilderness character are a way to assess the status of wilderness character and how well that character of an area is being preserved. As these qualities are monitored over time, they also show the trend of wilderness character where the overall quality of preservation can improve,remain constant, or decline. This trend evaluates stewardship actions over time by measuring the effects of stewardship actions taken – or not taken – by managers against the preceding status of wilderness character. The five qualities and a brief description (NPS in press) of each are as follows:

Figure 1 – Gates of the Arctic National Park and Preserve, Alaska, including the Gates of the Arctic Wilderness, managed by the National Park Service. Photo by Nyssa Landres.

1. **Natural** – this quality is preserved when the integrity of natural ecosystems within the wilderness remain intact and "are substantially free from the effects of modern civilization" (NPS in press). The natural quality can be degraded by intended or unintended impacts that affect or disturb natural ecosystems.
2. **Solitude and primitive or unconfined recreation** – this quality is preserved when the wilderness "provides outstanding opportunities for solitude or primitive and unconfined recreation" (Landres et al. 2008). This quality is degraded when visitors encounter settings with limited solitude, for instance because of high visitor numbers or restrictions to recreation opportunities.
3. **Untrammeled** – this quality is preserved when the wilderness is "unhindered and free from modern human control or manipulation" (Landres et al. 2008). The untrammeled quality is degraded by human activities or actions that control or manipulate the wilderness area, especially as they affect ecological systems.
4. **Undeveloped** – this quality is preserved when a wilderness "retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation" (Landres et al. 2008). This quality is degraded by human developments that modify human interactions with the wilderness environment, for instance through the use of motorized equipment or installed structures such as cabins.
5. Other features of value – this quality is preserved when the unique features of a wilderness are preserved. These features are

ones that are not included in the previous qualities. The Wilderness Act Section 2(c) defines these as "ecological, geological, or other features of scientific, educational, scenic, or historical value," and are used in the National Park Service's *User Guide for Integrating Wilderness Character Into Park Planning, Management, and Monitoring* (in press).

Because the five qualities of wilderness character are key to understanding that character in each wilderness area, they are used here as a framework to assess how wilderness character applies in Gates and Cedar Breaks.

Natural

NPS staff describe the ecological systems in Gates and Cedar Breaks as virtually free from degradations by modern civilization. In Cedar Breaks there is minimal data that can empirically verify ecological conditions. In contrast, a substantial amount of data is collected in Gates through the Arctic Network Inventory and Monitoring Program (ARCN), which is one of the primary methods Gates staff use to evaluate the integrity of the wilderness's ecosystems. However, due to the size of Gates, the information obtained from ARCN is difficult to extrapolate over the entirety of the park. The result in both parks is that staff often must rely on assumptions about ecosystem integrity when making management decisions.

Natural systems can be impacted directly or indirectly (Landres et al. 2008). Direct impacts are specific actions taken by people toward, or within, the wilderness that impact the natural quality of wilderness character. This type of impact is minimal in both parks, as neither Cedar Breaks nor Gates receive high numbers of visitors or perform a lot of interventions by management. Indirect impacts result from influences outside of park boundaries and are often caused by proximity to modern civilization. Whereas proximity itself doesn't necessarily degrade wilderness, it does raise the probability of degradation through factors such as the introduction of invasive species or decreased visibility from air pollution. Because Cedar Breaks is significantly closer to modern civilization than Gates is, Cedar Breaks experiences more indirect impacts, such as noise and light pollution.

Figure 2 – Cedar Breaks National Monument's recommended wilderness area as seen from the amphitheater rim. Photo by Nyssa Landres.

Solitude or Primitive and Unconfined Recreation

There are outstanding opportunities for solitude in both parks' wildernesses, in part because neither receives high numbers of visitors. Cedar Breaks park staff believe that this is because most of their visitors do not come to recreate in the wilderness; this is in contrast to Gates where visitors come primarily for the wilderness experience. The result is that each area receives few visitors, with Gates receiving 0.001 visitor per acre and Cedar Breaks receiving 0.005 visitor per acre in the 2010 season (Papenfuss, personal communication 2011; NPS 2010). The relatively low numbers of visitors contribute to feelings of remoteness. Both parks' relatively difficult access also contributes to the feelings of solitude by visitors and is likely one cause of the low visitor numbers. Solitude is related to remoteness, which is a direct indicator of this quality. One aspect of remoteness experienced in both parks is the inability for outside communication. Most contact is only possible through satellite radios, which are usually only carried by park staff. The feeling of remoteness can be degraded by human impacts, some of which are present in each park. For instance, in Gates degradations stem from frequently used campsites up Arritgetch Creek, and in Cedar Breaks visitors can find plane wreckage or

trash that has washed down from the rim of the amphitheater.

The other aspect of this quality is primitive and unconfined recreation. Neither park has established trails, which contributes to a high degree of primitive recreation (Landres et al. 2008). In terms of unconfined recreation, Cedar Breaks confines recreation by the wilderness study area's designation as a Natural Research Area, which prohibits camping within its boundaries. Correspondingly, the length of time visitors spend within the park's wilderness is limited. Visitors to Cedar Breaks wilderness must see it within a day, while visitors to Gates typically stay for multiple days and sometimes for weeks or months. Ultimately, the two parks express solitude or primitive and unconfined recreation quality similarly, despite having different causes.

Untrammeled

Both park wildernesses preserve the untrammeled quality because both take few management actions. In Gates's Foundation Statement, the park states its purpose as "to preserve the vast, wild, undeveloped character and environmental integrity of Alaska's central Brooks Range" (NPS 2009). From this statement, we can infer that park management is trying to keep the park and its wilderness wild, resulting in preservation of the untrammeled quality. However, because Gates's wilderness is huge and remote, it is unlikely park management could take extensive actions that would degrade this quality. At Cedar Breaks, management actions focus on the rim of the amphitheater where visitor use is concentrated, and the wilderness faces little to no manipulation.

Another aspect of the untrammeled quality is intentional or unintentional actions conducted without permission by the federal land manager, for instance, the introduction of nonnative game species. This type of action is unlikely present in either Gates or Cedar Breaks, and if it is, the results of the actions are not readily apparent to most visitors, including to me, as a temporary employee.

Undeveloped

Cedar Breaks and Gates are largely undeveloped. Cedar Breaks has virtually no human improvements within its boundaries; Gates's wilderness likewise has minimal human developments, but they are present. Some of the developments in Gates were authorized and others were not; in addition, some features are left over from when the land was privately owned. These features include user-created trails in high-use areas as well as some improvements, such as cabins, set aside exclusively for administrative use. Although the latter developments do not decrease visitor self-reliance, they nonetheless degrade the undeveloped quality. Another part of the undeveloped quality is the use of motorized equipment or mechanical transportation (Landres et al. 2008). In Cedar Breaks, there is little, if any, use of mechanized equipment or transportation. In part, the lack of use stems from geography such as narrow canyons, steep and loose soil, and general inaccessibility that makes using mechanized equipment or motorized transport impractical. Gates likewise uses little, if any, mechanized equipment, except for transport where fixed-wing planes are one of the only ways to access the park's interior and are allowed under ANILCA.

Other Features of Value

Cedar Breaks and Gates both have features of value that are not included in the qualities above. Gates lies along the caribou migration route that the caribou follow to their breeding grounds on the northern slopes of Alaska. These migrating caribou have long been a resource for Native peoples who have lived in the area for countless generations. Cedar Breaks has a long history of indigenous peoples living in the area, and both wildernesses contain cultural heritage sites and have conducted archaeological surveys that uncovered many artifacts.

Both areas have recognized scientific value, shown in Gates's ARCN program and Cedar Breaks's designation as a Natural Research Area. Scientific studies are ongoing in both park wildernesses. Both areas also possess scenic value and provide remarkable natural vistas for visitors. Gates's views are known for their expansiveness, while Cedar Breaks's are known for the colorful amphitheater and geological formations. The geology of Cedar Breaks alone is a feature of value for its continual evolution and color.

Conclusion

As places, Gates and Cedar Breaks are different, but as wildernesses and in terms of wilderness character, they have much in common. However, the evaluation above is not about comparing these two areas – it's about seeing how they both fit into the framework of wilderness character.

Wilderness character is present in every wilderness, and each area has its own unique expression of wilderness character. Because of these differences, however, wildernesses may be perceived as unequal despite their identical standing under law and agency policy. For example, a large and remote wilderness may be considered better than one that is small and close to urban areas. Nevertheless, the eligibility for wilderness

Continued on page 48

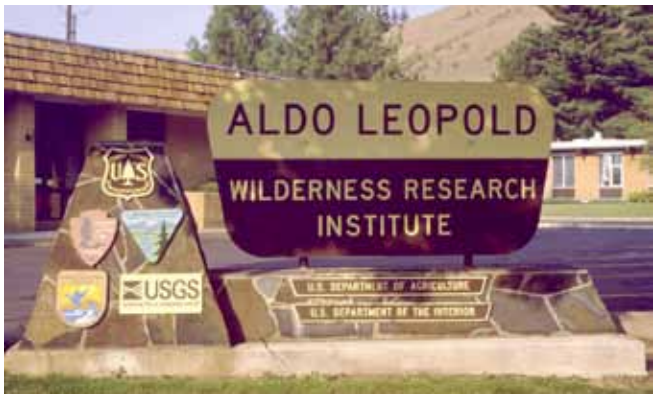
ALWRI RESEARCH NOTE

Long-Term Studies of Change in Campsite Conditions

BY DAVID N. COLE

Three long-term studies on changing campsite conditions were published in 2013. The first report brought together seven case studies of trends in the number and condition of wilderness campsites over periods ranging from 13 to 32 years (Cole 2013a). Case examples come from five mountainous wilderness areas in the western United States: Sequoia Kings Canyon Wilderness in California, the Eagle Cap Wilderness in Oregon, the Frank Church-River of No Return Wilderness in Idaho, and the Selway Bitterroot and Lee Metcalf Wildernesses in Montana, as well as Grand Canyon National Park in Arizona and Caney Creek Wilderness in Arkansas. The case studies used two different research designs. In one design, small samples of campsites were selected and studied in detail, making it possible to detect relatively small changes in condition. The other approach involved inventorying all campsites in an area and collecting rudimentary data on the condition of each campsite. This approach provides insight into landscape-scale change in the number and condition of campsites, but the relatively imprecise measures of campsite conditions do not provide reliable information on campsite change at the scale of individual sites. Most of these studies suggest that aggregate campsite impact increased for much of the latter 20th century, but that by the first decade of the 21st century, this trend reversed. Campsite impacts have recently plateaued or declined in most wildernesses in this compilation. In the most extreme cases, campsite improvement reflects (1) successful implementation of a use concentration or containment strategy, and (2) an active wilderness ranger program, involving obliteration of unnecessary or poorly located campsites and maintenance and cleaning of established campsites.

In the second publication, Cole (2013b) reported on a study that assessed long-term recovery of vegetation on six wilderness campsites in subalpine forests in Oregon that were closed to use and that received common resto-



ration treatments (scarification, soil amendments, mulch, transplanting, and seeding). Vegetation cover was assessed every year for the first 7 years following treatment, as well as 10 and 15 years after treatment. This made it possible to compare long-term treatment effectiveness to short-term efficacy. Plots that were closed and not scarified had virtually no vegetation cover even after 15 years without use. If long-used campsites in these subalpine forests are simply closed and allowed to recover on their own, restoration of undisturbed conditions will require hundreds if not thousands of years. Study results show, however, that simple treatments can accelerate recovery rates substantially. Scarification and transplanting were highly effective treatments, with seeding and soil amendment using organic matter and compost also contributing to success but to a lesser degree. The use of a mulch mat in contrast had no effect either positive or negative. Assessments of success conducted within the first few years of treatment overestimate treatment efficacy – particularly the effectiveness of soil amendments and seeding.

The third publication reported on campsite recovery in two national parks (Cole and Parsons 2013). In the late 1970s, in response to rapidly increasing visitor use and proliferating impacts, the condition of all campsites in the backcountry of

Continued on page 45

50th Anniversary Wilderness Celebration

A Time to Celebrate – A Time to Act!

BY VICKY HOOVER and GREGORY HANSEN

Successfully Moving Forward with the 50th Celebration

As 2013 nears its end, wilderness supporters across the United States – and around the world – excitedly await the grand anniversary year of 2014 – the 50th anniversary of the 1964 Wilderness Act and the establishment of America's National Wilderness Preservation System (NWPS). The closing months of 2013 find us making a major push to arm and engage volunteers to help organize 2014 anniversary events in their own states and communities in a concerted effort to meet our 50th goals of directly engaging the general public, youth, and our all-too-often ignored or underserved populations. Why this emphasis on youth and local communities who are not normally involved or interested in wilderness? Obviously, our young people hold in their hearts the very future of wilderness. Moreover, the National 50th Planning Team feels very strongly that, after 50 years, our diverse populations deserve to have more of a place in the wilderness community and to have their voices and issues not only heard, but understood – and thus appropriately acted upon.

A 50th or golden anniversary presents a unique opportunity – for many of us once in a lifetime – to heighten public attention on and interest in wilderness. The anniversary lets us promote this remarkable cultural achievement – the historic decision by society to legally set aside from development certain special places for all time and forever let nature dominate these remaining wildland landscapes. In an attempt to reach the largest public possible, it is imperative to plan wilderness awareness/educational events in as many places as we can with as many wilderness supporting audiences as possible, but also with an emphasis on our youth and our underrepresented communities.

Therefore, our 50th local events coordinators and their committees – in virtually every state – are eager to receive the help of as many local volunteers as possible as they now endeavor to get the word out and work with their local media to promote wilderness and the 50th anniversary events.

Most state committees are a partnership between federal agency staff and dedicated NGO volunteers who have a wilderness focus. These local event groups are requesting a team of helpers to assist in accomplishing essential 50th anniversary event tasks. To find out who is taking the lead in your state, please contact one of our local events co-chairs: Vicky Hoover (415) 977-5527 (vicky.hoover@sierraclub.org), or Kass Hardy (209) 372-0645 (kassandra_hardy@nps.gov).

Embracing Youth and Diversity in the Wilderness Movement

Generally speaking, Hispanic, African American, Native American, and most other underrepresented communities historically have felt closely connected to nature but have not always seen the link between their cultural relationship to the land and the contemporary concept of legislated wilderness.

However, there are a number of good examples of how Native and other underserved communities have embraced the idea of wilderness and found ways to successfully integrate the ideals of legislated wilderness into their own land management policies and practices. As a result, it is the National 50th Planning Team's sincere intent to draw on these positive examples to offer youth and our important underrepresented audiences real-life forums in which to work directly with the wilderness community to discuss and resolve cultural issues – some of which have been with us since the inception of the NWPS. The National 50th Planning Team, as well as our local 50th groups, are all working closely with young people and underrepresented groups to find out what the best ways are for us to bring the wilderness message to them

and in ways they can directly relate to wilderness, thus encouraging a better understanding of and support for wilderness among these groups.

The need to expand the diversity of the wilderness community is vitally important, so the National 50th Planning Team has asked all its committees and all local events organizers to include representatives from both youth groups and diverse communities. These teams have also been challenged to accomplish all 50th work within the diversity framework that has been established by the planning team. This call for diversity states: "Traditions of diverse communities celebrate and engage with wilderness in many different ways. The wilderness movement has not always recognized the full spectrum of ways in which people understand and enjoy wilderness. We recognize that many diverse communities have a connection with Earth Mother deep in their spirit – even though their traditions have not always expressed these connections in the same way as more 'mainstream' environmentalists."

The National 50th Planning Team is aiming for much more than simply a token representation of our diverse communities, as it is time to think nontraditionally. Examples include focusing on holding events in nontraditional places, developing partnerships with youth/diverse communities and organizations including the faith-based community, describing the benefits of wilderness in nontraditional ways, and encouraging all communities/ages to embrace and participate in the wilderness movement.

50th Anniversary Youth and Cultural Activities

A myriad of activities and programming is currently being considered by 50th anniversary planners at all levels for both youth and underserved communities. A few examples of how the National Committee and local coordinators are hoping to integrate youth and cultural activities into the 50th campaign include:

- youth panels and presentations at the 2014 National Wilderness Conference;
- youth scholarships to attend and support the 2014 National Wilderness Conference;
- National Youth Wilderness Leadership Awards that will be presented at the 2014 National Wilderness Conference;
- local and regional youth wilderness poster design contests;
- Wilderness Investigations Teacher Workshops for local Native teachers in conjunction with the 2014 National Wilderness Conference;
- Wilderness Investigations Teacher Workshops for local Hispanic/inner-city teachers in conjunction with the 2014 National Wilderness Conference;
- 2014 National Wilderness Conference on-site Wilderness Awareness Trail for local students, many of whom are coming from local underrepresented communities; and
- 2014 National Wilderness Conference Wilderness Diversity Festival that will be open to conference attendees and the general public.

There Is Still Time

We invite individuals and organizations to get involved with the planning and implementation of local 50th anniversary events and activities. You can also become involved in other key celebratory activities, such as the 50th National Conference in Albuquerque, New Mexico, October 15–19, 2014.

The time is upon us to celebrate and reflect on our many wilderness achievements over the past half-century.

The National 50th Planning Team welcomes your interest in getting involved at the local or other levels, and we respectfully challenge each reader to be brave, reach outside your comfort zone, and utilize the 50th as a means to begin to get to know and work with your local youth groups and/or underrepresented communities. The time is upon us to celebrate and reflect on our many wilderness achievements over the past half-century. And it is also time for us all to take action toward the common goal of properly stewarding the NWPS for the use and enjoyment of all people, as wilderness truly is "Yours to Enjoy – Yours to Protect!"

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Wilderness Human-Wildlife Interactions and Conservation Psychology

BY DANIEL R. TARDONA

Introduction

In wilderness, natural forces should be allowed to shape wildlife habitat, populations, and behavior to the fullest extent possible (Hendee and Mattson 2009). As Hendee and Mattson point out, an important component of the wilderness idea is the presence of indigenous wildlife in the wilderness setting, and Nash (1970) provides a definition of wilderness as a "place of wild beasts." The abundance, behavior, and distribution of wildlife reflect wilderness conditions. However, wilderness managers often encounter challenges in maintaining wildlife, managing wildlife-human conflicts, and anticipating wildlife behavioral responses to human recreational activities (see Figure 1).

Mattson (1997) considered wilderness-dependent wildlife to be a wilderness component most vulnerable to human contact. Although it is recognized that wilderness humanwildlife interaction issues should not be managed separately from all other components of wilderness character, the focus of this article is on what conservation psychology can offer to help the management of interactions between wilderness-dependent wildlife and humans and to suggest inclusion of conservation psychologists as members of interdisciplinary teams that manage wilderness-dependent wildlife. The emerging field of conservation psychology may offer the psychological theories, methods, and techniques with which to better understand human behavior in natural resource conservation contexts and to understand effective attitudes, motivations, and emotions of a diversity of cultural groups with regard to wildlife. Conservation psychology is a relatively new field of research that has the dual aim of understanding why people behave in ways that help or hurt the natural environment and promoting behavior that protects it (Clayton and Brook 2005; Saunders 2003; Winter 2004).

Figure 1 – Human disturbance such as these snowmobilers passing bison along Firehole River in Yellowstone National Park can influence wildlife behavior that can have negative implications for wildlife health and populations. Photo by Jim Peaco, courtesy of Yellowstone National Park.

Daniel R. Tardona in the backcountry of the Timucuan Preserve in Northeast Florida, looking to observe wildlife from a safe distance for the benefit of both animal and self. Photo by Cody Pearce.

It is only during the last 20 years that behavioral scientists have been recognized as essential members of conservation teams with regard to understanding issues in conservation biology. Also, the inclusion of animal behaviorists has provided new insights into solving conservation challenges and provided management tools for wildlife managers to manage species for behavioral diversity as well as biological diversity (Clemmons and Buchholz 1997; Festa-Bianchet and Apollonio 2003).

Figure 2 – Visitors viewing bull elk in Yellowstone National Park are inappropriately close; while people are naturally drawn to wildlife, observing animals from a safe and appropriate distance keeps both humans and wildlife secure. Photo by J. Schmidt, courtesy of Yellowstone National Park.

Effective wildlife management requires a team approach to both understanding the animal behavior side and the human behavior side of the wildlife management equation. Managing both animal and human behavior is critical in the total management of maintaining wilderness character. Wildlife managers recognize the need to manage people and their behavior, but only relatively recently have psychologists recognized that they can play a significant role in wildlife management and conservation.

Human Dimensions of Wildlife

Conover and Conover (2001) make numerous cogent arguments for why wildlife should be managed and protected. Some of their main arguments are that responsibility is owed to those groups or individuals who cannot act on their own behalf, wildlife should be protected because of the interests of future generations of humans, and wildlife should be managed to increase the value of wildlife as a resource for all members of society – not just the hunting and fishing community. The challenge is to understand the many different values placed on wildlife by humans while at the same time respecting the inherent value of wildlife for wildlife's sake.

Wildlife managers working in wilderness need an understanding of how human perceptions, attitudes, and values develop, how they are maintained, and how they translate into behavior with regard to wildlife-human interaction. Then, strategies, techniques, and interventions might be developed to better protect wildlife while at the same time providing recreational opportunities. However, it is important for wilderness visitors to have low impact interactions with wild animals while they discover their intellectual and emotional connections with wildlife. Young (2012) contends that the most important wildlife management priority in the 21st century will be managing human behavior. The importance of the human dimensions of wildlife management has been acknowledged as an integral part of wildlife management (Decker et al. 2001; Decker and Chase 1997; Decker and Enck 1996; Manfredo et al. 1995; Manfredo 1989; Decker et al. 1987) and includes understanding how humans value wildlife at the individual and societal level, social and individual behavior toward wildlife, economic values of wildlife, and public involvement in management decision making.

A Role for Conservation Psychology

What are the attitudes, values, and motivations with regard to human expectations of a wilderness experience in making contact with wilderness dependent wildlife? What are the life experiences, cultural values, and expectations of wilderness visitors from various socieoeconomic groups from urban, suburban, and rural areas in relation to wild animals? Human behavior during encounters with wildlife is clearly complex and compounded when one considers the multitude of variables dependent on what kind of wildlife is encountered and in what context. Saunders (2007) points out that theories and principles from psychology in collaboration with natural science may be the best approach to help wildlife managers create a more harmonious and sustainable world for all life-forms. For example, understanding ways to assist humans, especially children, in connecting with nature may have the effect of actually changing behavior despite some values that might be detrimental or indifferent to wildlife stewardship.

Conservation psychologists have conducted research that indicates the identity development in a child may be rooted in relationships to natural places and to other living things, including animals (Clayton and Myers 2009). Is human identity in relation to animals a lifelong developmental process? What are the differences, if any,

between interactions and experiences with wild versus domesticated animals? Research suggests that animal and human interactions may be important in the human development of a sense of self (Myers 1998; Myers and Russell 2003), which in turn, may help in human self-understanding and in self-regulation. It is this self-regulation aspect that may be of importance to management of wilderness-dependent wildlife and wilderness as a whole. A sense of connection with wildlife and with the wilderness environment has been shown to predict human behavior when interacting with wildlife and nature (Clayton and Myers 2009). For example, Myers and Russell (2003) explored and analyzed reports of 10 individuals with varying close experiences with wild black bears; all of these people lived in an area where close contact with bears was common to bear hunters and professional biologists. They found that these individuals had little fear of the animals, had great respect for them, and perceived bears as knowing and intentional animals. The important revelation of this study was that these people expressed how their experiences helped clarify their sense of what it means to be human and influenced their beliefs about the place of bears and human beings in the world community. Although this study included only a very small sample, it suggests how human–black bear relationships may affect a human's identity, and how identity may be relevant in managing human–black bear interactions.

How important wildlife observations and encounters are to a wilderness visitor depends on the visitor's reasons for pursuing a wilderness experience as well as the visitor's socioeconomic background, gender, and educational level, among many other complex variables. Schroeder (2007) explores the idea that

It is important for wilderness visitors to have low impact interactions with wild animals while they discover their intellectual and emotional connections with wildlife.

survival of wilderness-dependent wildlife might be linked to the education and affluence of people and possibly to the stability of human societies. Kellert (1996; 1993; 1989) has demonstrated commonality and variability of human attitudes, symbolic meanings, and relations to wildlife across cultures. The study of human values and value formation is an area in which conservation psychology is contributing to clarifying how values affect human behavior in human-wildlife relationships. For example, Fulton, Manfredo, and Lipscomb (1996) showed that wildlife value orientations such as wildlife protection and conservation affect attitudes and are translated into behavior.

Interpretation, Human-Wildlife Relationships, and Conservation Psychology

A major tool for wilderness managers in managing wildlife and wilderness character is interpretation and education. Wilderness-dependent wildlife is susceptible to both internal and external threats (Dawson and Hendee 2009), and achieving wildernessdependent wildlife management goals may be doubtful without public understanding, appreciation, and support. Effective communication, interpretation, and education will be essential as more people use wilderness areas and human development encroaches on wilderness, causing more conflicts between humans and wildlife.

The professional interpreter or environmental educator attempts to provide opportunities for people to make their own intellectual and emotional connections with meaning inherent in any natural or cultural resource, including wildlife. This may be one of the most potent areas in which conservation psychology can provide data with regard to understanding a diversity of audience backgrounds and wildlife perspectives of visitors and neighbors to wilderness areas. Such information can help interpreters and educators create effective programs with regard to wildlife appreciation, potential conflicts, and visitor behavior and attitudes. Conservation psychology research is helping assess the success or failure of interpretive and other wilderness-dependent wildlife conservation strategies that can help mitigate internal and external threats to wilderness wildlife (see Figure 2) and, hence, wilderness.

Wilderness Human-Wildlife Relationships Research

Efforts to manage wilderness-dependent wildlife are often hampered by inadequate understanding of human behavioral relationships with wildlife that are tied to attitudes, values, motivations, and expectations in the wilderness setting. As a living laboratory for the study of ecological relationships, wilderness can facilitate an understanding of human social relationships with all aspects of wilderness character, including human-wildlife relationships. Conservation psychology can expand knowledge and understanding about human relationships with nature, including

Figure 3 – These visitors are dangerously close when viewing a bear near Obsidian Creek in Yellowstone National Park; some wildlife species are much more likely to be disturbed by and react aggressively to the proximity of human observers. Photo by Jim Peaco, courtesy of Yellowstone National Park.

wildlife. Studies of visitor encounters with wilderness-dependent wildlife by conservation psychologists in situ may offer new insights into human and animal behavior and human-animal interactions in the wilderness context.

Summary

Human activities, especially recreational activities, directly or indirectly impact wilderness-dependent wildlife and, hence, wilderness character (see Figure 3). Recreational activities can impact soil, aquatic systems, and vegetation, which in turn can affect wildlife food supplies, shelter availability, and living space. Impacts to wildlife food, shelter, and living space can have influences on wildlife behavior such as survival, distribution, and reproduction (Cole and Landres 1995).

Conservation psychology has much to offer wilderness management of human-wildlife relationships and interactions. Conservation psychology asks questions about how people develop connections with animals and experience wildlife, the effectiveness of public interpretive and educational programs designed to focus attention on wilderness-dependent wildlife conservation, and possible links to the development of an environmental ethic. Both qualitative and quantitative psychological research methods are essential for understanding the human dimensions of wildlife conservation and management.

Wilderness serves many different human needs and behaviors that reflect many different values and perspectives on wilderness purpose and on wilderness-dependent wildlife (Cordell et al. 2005). Understanding human-wildlife relationships takes a multidisciplinary approach, and conservation psychologists can be an important part of the multidisciplinary team for the most effective management of wilderness-dependent wildlife in wilderness ecosystems.

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Continued on page 48

What Makes It Wild?

Visitors' Constructions of Wildlife and Wilderness in the Greater Yellowstone Area

BY ROBERT PAHRE and CARIE STEELE

Where once Americans saw wilderness as a hostile, barren, and uncivilized environment needing development, many now see it as an unspoiled natural area that should be protected from human manipulation (Callicott and Nelson 1998; Cole 2003; Cronon 1996; Nash 2001). These divergent perceptions reflect collective human experiences used to construct and reconstruct the meaning of wilderness.

Intellectual histories, travelogues, and philosophers have provided a qualitative tradition defining this wilderness. Survey research has evaluated many of these claims among recreational visitors to natural areas, finding both biophysical variables and wildlife-related variables that shape perceptions of wilderness. Key wildlife species, particularly large herbivores and top-level predators, are often associated with wilderness.

We contend that wildlife and biophysical setting affect wilderness definitions only *contingently*, depending on the sequence of experiences and on group constructions of the meaning of wilderness. Rather than seeing "wilderness" as associated with "wildlife," as is the case in some surveys, we trace a particular group's construction of the meaning of various species. That construction of wildlife, which can vary by location, sequence of sightings, and other conditions, affects the sense of place, and more specifically, whether they identify a future location as "wilderness." Wilderness is not merely "the place of wild beasts," as Nash (2001) suggests, but the place of *certain* wild beasts – and different wild beasts at different times, in different places, for different people. This interactive construction of wildlife and wilderness falls within a broader socialconstruction tradition in leisure research (Kyle and Chick 2007). That tradition distinguishes how people construct the meaning of a place (place identity) and the utility they receive from recreation in a place (place dependence). Here we examine both the construction of place identity (or sense of place) and the construction of wildlife observed at that place, with wildlife observations helping to construct the sense of place.

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Carie Steele.

As a result of this interaction between place and species, whether people see a place as wilderness depends on the sequence in which places are visited and the order in which they see particular species. Seeing a species first on the side of a road (see Figure 1) may make it "nonwild," while seeing another species first in a wilderness may make it "wild." Either way, early experiences change the definition of later experiences. Some of the factors that influence these meanings are (1) the species itself; (2) whether an animal was viewed from road or trail; (3) the context of previous sightings, whether sighted from road or trail; and (4) the ongoing group construction of each species' meaning.

The Social Constructions of Wildlife and Wilderness

Previous studies have found many variables associated with wilderness. For example, surveys of recreational visitors find that a natural setting, few encounters with other people, little human influence, physically challenging access with few built features, and natural sounds all make hikers more likely to identify a location as wilderness (Hall 2001;

Figure 1 – Students viewing bison from a roadside in Yellowstone National Park. Photo by Robert Pahre.

Borrie and Birzell 2001; Farrell, Hall, and White 2001; Manning 2003; Manning and Lime 2000; Mergliano 1990; Roggenbuck et al. 1993; Shafer and Hammit 1994; Stewart and Cole 2003a, 2003b; Watson et al. 2007). Wilderness values are associated with some features of the landscape, such as barren lands, mountaintops, alpine habitats, dense forests, and deserts – and not beaches, grasslands and prairies, or savannas (Appleton 1975; Brown and Alessa 2005).

Interactions with wildlife can be important for perceptions of wilderness, and some species even serve as symbols of particular wilderness areas (Glaspell et al. 2003; Hendee and Matteson 2009; Roggenbuck et al. 1993; Watson 2004, p. 3). Wildlife can be part of the "connection with nature" that visitors may associate with wilderness (Watson et al. 2007).

Much of this literature on wildlife and wilderness relies on invariant associations between some marker species and the place. Much of the literature identifies ungulates and large carnivores at or near the top of the food chain as key markers (Leopold 1933; Dasmann 1966; Hendee and Matteson 2009). Hendee and Matteson (2009, p. 324) suggest that "the distribution, number, diversity, and behavior of wildlife species can be used to measure the naturalness and solitude of a wilderness." In particular, Hendee and Matteson (2009) suggest that large carnivores, large and migratory herbivores, and species that are dependent on wild habitat may serve as an indicator of the wilderness quality of a location. This tendency for invariant associations reflects the "overly behavioral" slant identified by Glaspell et al. (2003), by which research identifies stimuli that lead to a "wilderness experience" as response.

More recently, scholars have explored the interaction of visitors and place in the ongoing construction of nature (Brooks, Wallace, and Williams 2006; McIntyre and Roggenbuck 1998). Some have looked at the construction of this relationship over time in particular places in given "nature/person transactions," while others examine how individuals and communities construct memories of wilderness. Like a few others (Kyle and Chick 2007), we examine this interaction not for individuals in isolation but rather focus on a group's construction of place.

Like Glaspell et al. (2003), we believe it best to engage in a more exploratory study first, examining qualitative narratives of wilderness before moving to a more structured research instrument. This strategy can identify how perceptions of wilderness are time specific and place specific. For example, Mullins and Maher (2007) note that the same place might be perceived differently at dawn and dusk – when animals are about – than in the heat of the day. In contrast, we emphasize *sequence* in determining how the temporal and spatial context shapes constructions of meaning. A trailside encounter with a moose has a different meaning before rather than after a roadside encounter. The context of the first encounter is incorporated into the meaning of moose for subsequent interaction at that site. Once viewed in a roadside encounter, moose may no longer be seen as a species only encountered in wilderness. This can make them a weaker indicator of the wilderness character of a location.

In addition to those questions of sequence, we must consider the social construction of both wildlife and wilderness. Participants did not construct the meaning of their experiences in isolation, as group interactions shaped each person's perceptions of both wildlife and wilderness. With others (Brooks et al. 2006; Kyle and Chick 2007), we believe it important to give greater attention to social context in the construction of place-related constructs and to look at how those constructs change over time.

We expect that effect of wildlife on the perception of a location as wilderness will depend on four variables: (1) characteristics of each species and

its reported association with wilderness in the literature; (2) the context of the current viewing, whether an animal was viewed from road or trail; (3) the context of previous sightings, whether sighted from road or trail; and (4) the ongoing group construction of each species' meaning. The first three variables are amenable to objective measurement, whereas the fourth requires close observation. In addition, we were careful to note control variables from the literature, such as terrain, physical difficulty, and crowding.

Exploratory Research Project

Our subjects were 11 students from the University of Illinois at Urbana who self-selected into a field course entitled The Politics of Wildlife and Wilderness in the Greater Yellowstone. A prerequisite course provided background knowledge about public land management, ecosystem management, wilderness, and other environmental issues. Both courses emphasized the legal definition of wilderness in the Wilderness Act of 1964, while acknowledging that other, personal definitions were possible and legitimate.

The course spent eight days in Grand Teton National Park (GTNP) and Yellowstone National Park (YNP). Students engaged in hiking, wildlife viewing, meetings with experts, class readings, journal writing, and discussion. Hikes were a key element of the course design (see Figure 2). Table 1 codes the hikes in terms of factors the literature has associated with wilderness. Variables such as terrain, habitats, and distance from the road helped us interpret students' perceptions in light of the previous literature.

While on the trail, we asked students individually and collectively, "Is this wilderness (yet)?" and "Why or why not?" Perceptions of wilderness were included in class discussions, and students wrote open-ended reactions to the experience in their journals. We took notes on student observations relevant to their perceptions of wildlife, wilderness, and the learning experience. These notes reflect formal class discussion, informal conversations on the trail, and written work in journals and worksheets. We report two groups of results. The first results compare predeparture and postreturn reflections on the experience overall. The second results are site specific from our notes on participants' reactions to particular places.

Compared to previous studies of wilderness perceptions, this participant-observation method most resembles an open-ended survey design (Hall 2001). Such methods are occasionally used in wilderness studies. For example, Watson et al. (2007) compile observations about wilderness in Alaska from writers, Native and non-Native residents, and visitors. Mullins and Maher (2007) report participants' reflections on experiential education, nature-human relationships, and other topics gathered over a multimonth paddling trip in northern Canada.

Our exploratory study findings can guide future studies by revealing some attributes of the wilderness experience overlooked in previous research. As leaders of the group, we could observe in detail how participants perceive wilderness across locations experienced in a particular sequence, as well as the process through which individuals and groups jointly construct meanings of wilderness (Sharpe 2005). Knowing that this student group was unrepresentative of all wilderness visitors reinforces the need for a second stage of research.

Changing Constructions of Wildlife over Time

We reviewed the aggregate differences between students' predeparture and postreturn reflection papers to see how the group experience shaped perceptions of wildlife and wilderness. Because these were open-ended papers, there was no requirement that either term be mentioned. We coded mentions of particular themes.

Students' predeparture reflections tended to discuss nature (80%), wildlife (50%), and ecosystems (50%). Only 30% of the students mentioned wilderness, 20% mentioned bison, and no other species received more

Figure 2 – Hiking toward the Beaver Ponds in Yellowstone National Park. Photo by Robert Pahre.

Table 1 – Characteristics of potential wilderness locations

Hike, park*	Distance	Usage†	Terrain, habitats	Wildlife seen††, §	Perceived wilderness
String Lake GTNP	5.5 kilometers (3.4 miles) Loop	Moderate	Lodgepole forest Wetlands and lake	Marmots Elk	Low
Cascade Canyon GTNP	14.6 kilometers (9 miles) Out and back	High	Spruce-fir forest Wetlands Talus slopes	Marmots, pika Moose Porcupine	Moderate
Ribbon Lakeǁ YNP	11.8 kilometers (7.3 miles) Loop	Low/High	Grassland Spruce-fir forest	Bison (close) Grizzly print	High
Upper Lamar YNP	8.1 kilometers (5 miles) Out and back	Low	Grassland	Wolf, grizzly prints Bison herd Pronghorn	High
Beaver Ponds YNP	8.3 kilometers (5.1 miles) Loop	High	Sagebrush Wetlands Open lodgepole forest Spruce-fir forest	Black bear (close) Elk (close) Gopher snake (close)	Moderate
Bunsen Peak YNP	6.8 kilometers (4.2 miles) Out and back	Moderate	Montane Subalpine	None	High

* Hikes are listed in chronological order.
† Use is measured by contact with other parties: Low 0–2, Moderate 3–6, High 7–10.
†† Wildlife associated with trail is limited to species the participants found charismatic.
§ "Close" is less than 100 yards for bison, black bear, and grizzly bear; 25 yards for others.
ǁ The Ribbon Lake hike included extensive stretches through unmarked, unfenced thermal features. Usage was low in the backcountry, very high in front-country portion.

than one mention. One anticipated a lot of spectacular scenery but didn't expect there to be much wildlife. Both nature and wilderness were often defined in terms of scenic beauty, unwittingly reflecting the theme of "monumentalism" found in the history of the national parks (Runte 1987). The concept of nature or natural was often contrasted to state parks, and both ecosystems and nature were described in scenic terms. The only terrain associated with nature in the predeparture reflections was forests.

The postreturn papers mostly addressed topics such as sustainability, trade-offs between tourism and preservation in the National Park Service mandate, and the advantages of experiential learning. Yet even while addressing those topics, half of the students discussed wilderness, and everyone mentioned ecosystems. As an illustration of these connections, one essay on preservationism linked wildlife, ecosystems, and wilderness.

This shift to an ecosystem focus affected the choice of the animals they discussed. One connected the ecosystem role of the wolf to the nature of wilderness. Another constructed spawning cutthroat trout as a natural process found in wild nature, while a third constructed bears feeding on trout as the relevant natural process. One discussed amphibians feeding on insects as an important natural process in the region, although he did not connect this ecosystem concern to the concept of wilderness.

Although bison was the most-mentioned species before departure (at only 20%), postreturn papers mentioned wolves (70%), bears (50%), bison (40%), elk (30%), and trout (20%), in addition to the insect-amphibian connection. Close encounters with such species while "hiking in the deep wilderness" strengthened the link between some animals and wilderness. Yet, as we will see, the group constructed elk in a distinctive way. One paper, "A Case against Elk," discussed bison, wolves, grizzly bears, and trout with reference to natural processes in ecosystems – conspicuously excluding elk. The tone of the group's construction is evident in a confession that, "Sure, everyone became somewhat jaded of bison and elk, but it was still amazing to be so close to such majestic creatures."

Previous research would expect that many charismatic megafauna are linked to wilderness, whereas other species, such as rodents and songbirds,

have no association with wilderness at all (Hendee and Matteson 2009). Our findings are largely consistent with these observations, while adding this group's own, distinctive meanings of species. Most striking, cutthroat trout – which Hendee and Matteson (2009) list as a wilderness-dependent species but is generally excluded as a marker of wilderness – became constructed as a marker for wilderness because of its role in the natural processes of grizzly bear predation of spawning trout. In contrast, elk became a marker of nonwilderness as a result of frequent roadside sightings. This group's emphasis on wolves, a clear marker for wilderness, also shaped perceptions of elk – the students did not see elk in the area where they saw a wolf. This construction of elk is noteworthy because it is a large, charismatic species that was unfamiliar to these Midwestern students before their experience.

Student Perceptions of Place

We were interested in how students perceived particular locations in these two national parks as wilderness or not. This question implies that each of these parks as a whole is too large to be classified either way, and that wilderness is a more local-level category. Because YNP encompasses more than 2 million acres (809,717 ha), certainly the park is big enough in principle to encompass many distinct wilderness areas.

Spatial and temporal context provided key elements of how students defined each wildlife species and thus how they interpreted the association between that species and place. While other variables found in the survey literature also played a role, we found that wildlife viewing most dramatically changed students' perceptions of wilderness. The students found wildlife sightings much more meaningful while on the trail. However, even this varied by species. Trailside encounters with bison remained interesting, perhaps because they were known to be more dangerous than other herbivores. Trailside sightings were especially meaningful if the animal was "close" (100 yards for bison and bears 25 yards for others).

The first example of wildlife sightings changing perceptions came on the Cascade Canyon Trail in GTNP. Students did not initially classify this location as wilderness despite the mountainous terrain, and despite encountering few other hikers beyond Inspiration Point. At the turn-around point (the Forks), many students reassessed their views. Variables that might have affected the reassessment here were a slight increase in physical challenge and a denser forest that began to block mountain views. On the return hike, several more students changed their assessment after a moose sighting – the first of the trip. This first encounter with a charismatic species transformed the outbound "nonwilderness" trail into "wilderness" on the return journey (Watson et al. 2004, p. 3). Without the moose sighting, the terrain on this portion of Cascade Creek had not been sufficient for students to classify it as a wilderness.

The Ribbon Lake hike in YNP illustrates the complexity of the wilderness construction process. The hike began among gentle hills on the north end of the Hayden Valley, with bison visible at moderate to far range. Participants did not classify this grassland as wilderness. Two trail experiences dramatically changed perceptions. Students found a fresh grizzly footprint on the trail and then had a close encounter with a bull bison that raised its tail in warning and wallowed in front of us when we rounded a corner and appeared in its personal space. Leaving the trail to detour around the bison resulted in complete agreement that this location, as well as the rest of the trail, was indeed wilderness.

This change in perception occurred without any measurable change in terrain. Moreover, bison were by no means novel to the students, who had seen dozens of them along roads by that point. Factors such as the closeness of the encounter, being on a trail, not having the protection of a vehicle, and needing to take an offtrail detour, provided the key context. Students continued to cite the bison's closeness and the need for a detour as shaping their perceptions of place. The context of this close, trailside encounter and a sense of danger provided students with additional information, which they incorporated into their constructed meaning of this bison. As a result, the encounter transformed a location that had previously been nonwilderness into wilderness.

The full context of the sighting is critical for its interpretation. Bison were too common along the road to be a marker for wilderness. Interestingly, *distant* bison seen from a trail were also not a wilderness marker. Only "close" or "dangerous" bison could mark a site as wilderness – concepts that were constructed over a sequence of bison (and other wildlife) experiences.

Seeing a black bear on the Beaver Ponds trail also proved decisive for student perceptions. This heavily used trail begins behind the Mammoth Hotel, with clear views of the highway for much of its early portion and with close proximity to a radio/cell phone tower. The terrain is sagebrush savannah, followed by ponds and some open forest. None of those terrain features have strong wilderness associations in the literature, and the proximity of a development center would normally make the site appear nonwilderness.

Despite these conditions, most of our group perceived the site as a wilderness location after seeing a sow and cub on the trail. Yellowstone's bears were clearly marked as a wilderness species, and their presence marked the trail loop accordingly. Most students also saw this encounter as dangerous, strengthening the wilderness significance of the bear.

Some wildlife encounters *became* the context through which the rest of the experience was perceived and the quality of wilderness evaluated. Although the students did not classify the northern Hayden Valley as wilderness, almost all students identified a similar grassland, the Upper Lamar Valley, as wilderness, even when they were clearly in sight of a road. The key difference was that students had seen a wolf – barely identifiable with binoculars – across Soda Butte Creek from the trailhead. Spotting fresh wolf tracks on our trail, which the students immediately identified with "their" wolf, further strengthened the association of this site with wilderness. Viewing a wolf was so important for the students' constructed notions of wilderness that it trumped other markers of nonwilderness such as a visible road. In this location, as at Hayden Valley, distant bison were insufficient to mark the site as wilderness.

The meaning of the wolf sighting reflected a group construction of wilderness that had occurred throughout the week. After watching a National Geographic program about Yellowstone's wolves while on the van, students came to identify with wolves, even referring to themselves as a pack. In contrast, elk became a nonmarker for wilderness – almost a nuisance species in the students' view.

These examples are consistent with survey findings that viewing charismatic animals may affect perceptions of wilderness. Our results differ in illustrating how variations in the context of such encounters affects perceptions of wilderness, a factor unspecified in the survey literature. The students' definition of wilderness is context driven. The same group perceived the same animals or similar terrain differently depending on the experiential context, sequence of sightings, and group construction of meaning. Large animals seen for the first time on or near a trail marked an experience as wild, as did some close experiences.

To summarize, students' constructions of wildlife varied (1) by species; (2) whether it was viewed from road or trail; (3) the sequence of sightings, in that viewing an animal from the road shaped the perception of later viewings from both road and trail; (4) associations with other species; and (5) over time, as the students shared their perceptions of wildlife with one another.

Using the Findings for Future Surveys

This study shows that the construction of a location as wilderness can be an ongoing process based on a collection of experiences. Without consideration of temporal and contextual factors, it is difficult to parse out which factors were most influential in the process. Moreover, generalizing across all users makes it harder to determine why *specific* recreational visitors perceive *particular* locations as wilderness. If, as some maintain, wilderness lacks a clear universal definition but is inherently personal and multivalenced (Watson 2004; Whiting 2004), more contextual definitions become essential to our analysis of wilderness.

Observing group constructions of meaning, such as our students' construction of elk as a marker for nonwilderness, probably requires close qualitative study. Other research questions would be amenable to context-based survey questions (Roggenbuck et al. 1993). Instead of counting "wildlife sightings" or asking about the sightings of particular species, our findings imply that researchers should design questions around the sequence of sightings and respondents' background beliefs about individual species. Surveys of groups should ask questions about the beliefs of other group members. Our wildlife sighting log provided another way to collect information about the context of respondents' wildlife sightings. That log emphasizes the sequence in which animals are seen and whether they were associated with wilderness in past sightings or in current ones.

Context, operationalized in terms of time, place, and group constructions, shapes perceptions of both wildlife and wilderness. Moreover, these concepts may interact, causing new experiences to change perceptions of one or both. For example, the group's construction of elk changed rapidly. Although initially unfamiliar to the group, frequent roadside viewings marked elk as a nonwilderness species. After that, even close trailside encounters with wild elk could not mark a place as wilderness. Species and place interacted, with meanings changing over time.

Changing visitor perceptions and standards pose significant problems for wilderness management. As Bacon et al. (2001) observe, management tends to assume continuity in perceptions. This justifies consistency in management. If, as we have argued, constructed perceptions of wildlife and wilderness are ongoing processes, management strategies must focus on cumulative experiences instead of isolated events or sites. Such strategies may enhance users' experiences as well as strengthening a sense of wilderness stewardship among visitors.

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Cities and Wilderness

A New Perspective

BY INGO KOWARIK

Introduction

Urbanization conflicts with biodiversity conservation as many cities are located close to biodiversity hotspots (Cincotta et al. 2000). The traditional view of conservationists on cities is predominantly negative and might be summarized by the phrase "cities destroy nature." This inevitably happens when parts of historical landscapes are replaced by built urban structures. In addition, the ecological footprint of cities affects ecosystems indirectly from regional to global scales (Grimm 2008). Yet landscape transformation in the wake of urbanization can also result in novel habitats within the urban fabric. These often differ fundamentally from historical patterns but may nevertheless harbor surprisingly high numbers of plant and animal species (Kowarik 2011; Werner 2011).

Rethinking the relationship between cities and nature is a pivotal challenge for nature conservation in the "Urban Millennium" and also for the future of wilderness. More than half of the world's population now lives in urban areas, and this proportion will grow steadily (United Nations 2012). Consequently, more and more people risk being increasingly disconnected from traditional wilderness areas. The resulting "extinction of experience" (Miller 2005) will certainly affect attitudes toward nature in general, including the willingness to support conservation approaches beyond cities (Miller 2005; Dunn et al. 2006). Enhancing wilderness areas *inside* urban regions would thus facilitate, as an important side effect, commitment to wilderness conservation *outside* cities. A further argument emerges from health studies: there is growing evidence that access to nature within urban regions positively affects human health and well-being, although causal relationships are difficult to determine (Fuller et al. 2007; Lee and Maheswaran 2011).

Although there is increasing support for green spaces in cities in general, relating wilderness issues to urban environments often evokes controversy. How does this relate to the perception of cities as the antithesis of wilderness? Terms such as *wilderness*, *wildness*, or *naturalness* have been traditionally related to pristine landscapes with minimal human interventions – and such terms are ambiguous, often value loaded, and are inconsistently used (Ridder 2007). This article illustrates a conceptual approach to linking wilderness ideas with urban environments and uses examples from Berlin to demonstrate how different kinds of wild nature can be included in urban development.

Ingo Kowarik.

The Four Natures Approach

Early European concepts have demonstrated that naturalness can be defined quite differently but follow one of two perspectives (Kowarik 1999): (1) by a reference to historical benchmarks (pristine landscapes virtually untouched by humans) or (2) relying on a high level of self-organization of ecosystems that may be achieved even after human-mediated, nonreversible shifts in environmental conditions. Accepting self-organization of ecosystems as a way to define naturalness allows addressing novel ecosystems that emerge in urban space as natural even though they usually diverge profoundly from pristine landscapes in species assemblages and site conditions. Although the conceptual differences between the two perspectives of naturalness are clear, they are difficult to communicate to a broader public, and barriers to acceptance remain. Many conservationists rely on historical benchmarks for defining naturalness as well as wilderness – and this likely reflects a higher valuation of historical ecosystems. There are good reasons for doing so: historical ecosystems usually harbor more rare and endangered species than urban habitats. Despite being different, however, urban ecosystems may achieve a high level of self-organization and thus provide chances for

urban people to experience natural processes in their own neighborhoods. Therefore, the urban challenge is to enhance wild nature within the frame of urban land uses despite remaining differences between urban and nonurban ecosystems – and ambiguous terminologies.

The "Four Natures approach" has been promoted since the 1990s (Kowarik 2005) as a conceptual framework in which to structure and communicate the variety of green spaces within urban borders without an implicit connotation of values that often are inherent in wilderness terminologies. Using the word nature as an overarching term signals openness toward all manifestations of natural elements and processes on urban land, and this approach addresses four kinds of nature. These four kinds differ fundamentally in terms of landscape legacies, human interventions, and environmental characteristics, but are not more or less valuable per se in an urban context. All of them rely on natural elements and processes that are accessible to city dwellers.

1. Nature of the first kind encompasses remnants of pristine ecosystems such as old-growth forests or wetlands that often exist at the urban fringe or have been incorporated in the urban matrix (see Figure 1).
2. Nature of the second kind represents rural cultural landscapes that result from the transformation of pristine landscapes by human land uses such as agriculture. Fields, hedges, and grasslands are prominent examples that are often to be found in the urban periphery.
3. Nature of the third kind covers urban green spaces such as gardens, parks, or graveyards that have been generated, and are maintained, by deliberate horticultural interventions, either by transforming existing habitats or establishing new green spaces after habitat destruction.
4. Nature of the fourth kind, finally, emerges spontaneously as a novel urban green space on vacant lots or other urban-industrial sites despite severe habitat transformations. It may be shaped accidentally by human agency but may also develop towards wild urban woodlands.

Traditional Wilderness and Novel Wildness on Urban Grounds

The four types of nature can be addressed as a series of transformation stages of pristine landscapes. Whereas remnants of nature of the first kind clearly correspond to the traditional idea of wilderness, habitats comprising the fourth kind represent the greatest distance from historical benchmarks in terms of soils, hydrology, or species assemblages. High numbers of nonnative plant species often prevail on urban wasteland and may constitute novel types of urban woodlands (Kowarik 2005). These may demonstrate a high level of self-regulation in terms of soil formation, species immigration and extinction, and biotic interactions and, thus, evolve toward a novel type of wildness. Areas of both traditional wilderness and novel wildness show a functioning of ecosystems without deliberate human interventions. This correspondence opens a perspective for linking wilderness ideas with specific urban-industrial sites despite remaining land-use legacies.

Take the Südgelände in Berlin as an example (Kowarik and Langer 2005). Parts of this former railway yard had been abandoned for around 60 years (see Figures 2 and 3). During this period, hundreds of plant species had colonized bare ground on tracks and adjacent areas. Pioneer species had been replaced by perennial grasses and herbs, and the establishment of trees finally led to the rise of woodlands in many parts of the area. Thus

Figure 1 – Remnants of pristine forests on Berlin's outskirts. Photo by Ingo Kowarik.

far, either native trees (birch or poplar species) or alien trees dominate the pioneer forests. Most notably among the latter is the North American black locust (*Robinia pseudoacacia*). Due to the limited life span of the woody pioneers, decay and regeneration within the stands proceed and illustrate conspicuously the functioning of natural processes. These novel forests are unlikely to converge toward historical species assemblages.

Enhancing Wildness within Berlin's Four Natures

Berlin is widely regarded as a key setting for the science of urban ecology and attempts to integrate urban nature into the urban fabric (Lachmund 2013). Today, about half of Berlin's surface consists of built-up areas, 20% is covered by forests, green spaces make up 10%, rivers and lakes 6%, and agricultural land 7%. Using the Four Natures framework allows us to illustrate different strategies on how wildness can be enhanced in cities, aiming both at conservation goals and better access for urban residents to natural processes.

Nature of the first kind: Prevailing strategies are conservation and restoration. Most remnants of old-growth forests and wetlands are currently legally protected as nature reserves and, except for some vulnerable marshes, mostly accessible to the public. Restoration efforts mainly target wetlands and riverine habitats that have been adversely affected by lowering of groundwater or water pollution. Measures aim, for example, at improving hydrological conditions or restoring reed communities along rivers. Recently, beavers have recolonized major parts of Berlin's river system. Beyond conservation areas, 10% of silviculturally managed forests have been committed to natural development as part of a certification process.

Nature of the second kind: Most remnants of the rural cultural landscapes within Berlin are legally protected. Moreover, maintaining management is crucial because almost all grasslands in central Europe depend on agricultural uses such as hayfields or grazing lands. A maximum level of wildness is prevented here, but margins for enhancing biodiversity within the second nature clearly exist. Farmers are supported to achieve a biodiversityoriented grassland management. Alternatively, maintenance of grasslands is realized directly under the supervision of nature conservation authorities. Several remnants of pasture woodland are maintained by silvicultural practices.

Nature of the third kind: Although being designed and shaped by maintenance and recreational uses, parks, gardens, and other urban green spaces can be hotspots of urban biodiversity. In particular, historical landscape parks harbor species-rich grasslands and an array of rare animal species that are associated with old and decaying trees, including bats, woodpeckers, or insects associated with rotten wood. Some of these parks are conserved both as garden monuments and nature conservation areas. Strategies here attempt to optimize a biodiversity-friendly management in collaboration with various stakeholders. Wilderness, in contrast to culture, has often been part of historical design concepts and implies chances to enhance natural processes in parks – such as accepting the decay of old trees or allowing some wild vegetation in different vegetation layers – even from a cultural heritage perspective. As one of the goals of Berlin's recent biodiversity strategy, a biodiversity-friendly maintenance of all types of urban green spaces is expected to increase.

Nature of the fourth kind: Since the development of Berlin was slow after World War II, the recovery of nature on demolished or abandoned areas was more widespread than in most other cities. Wastelands were transformed into novel spaces of nature dominated by different stages of natural succession up to urban woodland (see Figures 2 and 3). Emerging Fourth Nature is often tol-

Figure 2 – Like the Südgelände railway, the former Nordbahnhof railway station in central Berlin shows how novel forests develop at the borders while intermediate succession stages are maintained in the central area. Photo by Ingo Kowarik.

erated along transportation corridors or within built-up areas. Since the 1980s, some novel green areas have been integrated formally into Berlin's green infrastructure. The characteristic Berlin approach was, and remains, to accept generally novel types of urban nature even when dominated by nonnative species – a contemporary urban rebuke to nativist conceptions of landscape. In addition to a formal protection status as park or conservation area, several approaches to handle Fourth Nature have been adopted, or combined, as was achieved in the Südgelände (Kowarik and Langer 2005):

- On a defined area, woodland is allowed to develop without human intervention, resulting in ecosystem functioning and independent losses or gains in animal or plant species.
- In other parts of the area, intermediate stages of succession are maintained by mowing or grazing because of aesthetic reasons and the habitat functions provided for rare and endangered species of plants and animals.
- A system of paths, mostly following ancient tracks, and other infrastructure elements such as benches have been established to enhance access of visitors.
- Works of art have been installed within the wild vegetation to signal at a symbolic level that "lost" wastelands have been transformed into novel green spaces (see Figure 4).
- While access to most areas is unregulated, a runway leads visitors through more sensitive biotopes such as woods and open grasslands in the core area.

While "pure" Fourth Nature is maintained in some areas of Berlin, human intervention, or the adding of new horticultural-shaped landscapes in other areas, leads to hybrids between Fourth Nature and Third Nature. Such combined approaches foster public access and associated nature experiences for many residents. They also contribute to a broader acceptance of wild urban nature. Studies from environmental psychology indicate that traces of human interference such as paths, benches, or mowing parts of vegetation, which provide physical and visual access, enhance the acceptance of wildness (Jorgensen et al. 2007; Hofmann et al. 2012). Access to wild nature through cultural interventions seems paradoxical yet has helped to gain its acceptance. Berlin illustrates many possibilities for the enhancement of wild nature in urban space. These approaches to wild nature might not only strengthen links between nature and urban residents but also have a positive impact on the pursuit of conservation beyond cities.

Figure 3 – Decay and regeneration processes in novel urban woodland, Südgelände, Berlin. Photo by Ingo Kowarik.

Figure 4 – Works of art symbolize a shift of values in novel urban green. Photo by Ingo Kowarik.

Acknowledgments

Thanks to Leonie K. Fischer and Matthew Gandy for comments on a previous version of this article.

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Continued from GROWING HUMAN FOOTPRINT ... IN ANTARCTICA, page 13

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Communicating Biodiversity and Wilderness to Urban People

BY STEFANIE JUNG and BRUNO STREIT

Nature Conservation and Awareness in the Era of Urbanization

By 2050, roughly 6.3 billion people will live in urban areas, which will be six times the number of people that lived in cities in 1960 (United Nations 2011). Seventy-four percent of people in Germany live in urban areas, 82% in the United States, and 100% in Singapore (CIA 2010). As the world faces this rapid urbanization, the pressure on natural ecosystems and their functional services has intensified globally (Streit 2006). In many areas, including large parts of Europe, wilderness areas only persist in national park core zones where the majority of urban people will rarely go. Taking into account that modern city people spend more than 80% of their time in enclosed spaces such as buildings and cars, new efforts need to be made to bring them in touch with nature, wilderness, and biological diversity.

Innovative and integrative concepts are needed to convey biodiversity issues into different kinds of political sectors and to cooperate with a variety of governmental and nongovernmental institutions. City planning and urban social concepts have to interact with biodiversity maintenance. While urbanization, suburbanization, and constant urban sprawl is taking place, the modern lifestyle in postindustrial service and information societies make the traditional antagonism of urban versus rural obsolete. Green areas and green belts in European cities potentially provide the habitat for many plant and animal species. In terms of species richness, urban areas can exhibit plant diversity richer than their surrounding rural areas (Kowarik 2011), although nonnative species may dominate. In addition to providing habitats, these areas provide benefits for human well-being (Tzoulas et al. 2007). Within cities, cultural services such as recreation and open natural spaces for outdoor activities are considered as the most important eco system services provided by those urban green spaces. Wild nature outside the urban sprawl is too far distant geographically for the majority of city dwellers because they spend their leisure time predominantly within the city limits or their local neighborhood (DNR 2009).

Stefanie Jung.

Bruno Streit.

The establishment of wild nature areas in urban environments is one possible approach that could bring people in touch with biodiversity and its multiple functions for all.

Biodiversity – An Academic Term and a Complex Issue

At the 1992 Earth Summit of the United Nations, biodiversity maintenance was declared as an international priority target, culminating in the declaration of the Convention on Biological Diversity (CBD). Despite the crucial importance of biodiversity conservation and the high priority given to it by national and international political institutions, many people all over the world are unaware of the fundamental significance of the diversity of ecosystems, species, and genes for their own well-being

and for future human populations. In Germany, the terms *biodiversity* and *biological diversity* are not very common and are considered too academic, statistical, complicated, and artificial. A representative survey of the BioFrankfurt network conducted from 2007 to 2011, based on more than 8,000 individuals in Germany, revealed that the term *biodiversity* has become more widely heard and understood among the German population during the past five years. In 2011, 37% of respondents were familiar with the term *biodiversity*, whereas in 2007, only 27% said that they have ever heard or read the term *biodiversity* (*Biodiversität*) or *biological diversity* (*Biologische Vielfalt*) (Jung et al. 2012).

In an international comparison, Germany still remains on a low level. When the Union for Ethical Bio Trade asked people in different countries, "Have you heard of biodiversity?," in France 95% of people answered yes, in neighboring Switzerland 83% confirmed yes, and in Germany only 42% reported yes (UEBT 2012). Several countries reported more than 50% of respondents said yes: Brazil (97%), Peru (52%), UK (66%), and United States (53%).

In the German study (Jung et al. 2012), people (ages 14+) were asked in more detail what, in their opinion, the term *biodiversity* means. More than half of them (57%) voted correctly for "the diversity of genes, species, and ecosystems" as the commonly used definition of *biodiversity* in 2011 (up from 53% in 2007). The awareness of the loss of biological diversity as a big problem for humankind had scarcely increased in Germany: from 48% in 2007 to 52% in 2011. The study also showed that a greater level of knowledge, awareness, and appreciation of biodiversity corresponded with higher educational backgrounds of the respondents (Jung et al. 2012).

Figure 1 – The BioFrankfurt network comprises 12 member institutions.

How to Communicate Biodiversity?

Several leading institutions from four different fields of biodiversity activity (biodiversity research, conservation management, sustainable development, and education) that are located or have their headquarters in the Frankfurt area of Germany, decided to create a strong association and founded the BioFrankfurt Network for Biodiversity (see Figure 1). These institutions pool their knowledge, their experiences in the field, and the international expertise of their companies and employees to share a common responsibility for biodiversity conservation. They bring regional, national, and global political and societal aspects of biodiversity and sustainable development into the network. The two public zoos and botanical gardens as well as museums and outdoor institutions are important partners in knowledge transfer to adults and children in the region.

The BioFrankfurt Network for Biodiversity was founded in 2004 on an informal basis to raise public awareness about the significance of global biodiversity, to develop effective strategies for its preservation, and to enhance research, conservation activities, and interactions. The 12 member institutions and 9 associated partners develop understandable tools for the public, such as educational programs to distribute conservation messages. Activities include events, talks, excursions, guided tours, and a regional "Biodiversity Week" with more than 70 events and special programs, including teaching aids on biodiversity for schools and teachers.

In a regional public relations campaign for biodiversity in 2007 to 2009 with the slogan "Banks – Business – Biodiversity" the network combined information on regional biodiversity with promotional aspects for the Frankfurt area (see Figure 2).

Scientific background studies had revealed the high regional biodiversity of the Frankfurt area (Rhine-Main area), and this information was communicated by

posters throughout the city with information about various biological species and a positive attitude about their valuable contributions to everyone's quality of life. The posters were displayed in many places in the town to inform city residents during the public relations campaign (see Figure 3). The poster campaign was supplemented by films (short video sequences on info screens), events, talks, exhibitions, guided tours, and further activities (BfN 2009).

Figure 2 – Combining information on regional biodiversity with the image of the Frankfurt area.

A New Approach: Nature, Biodiversity and Wilderness in the City

The term *nature* has various meanings and associations. With respect to the environment, it is usually associated with pristine and untouched, but in Europe, it is also frequently associated with cultivated, orderly, and pleasing rural landscapes. According to a representative nature survey conducted by the German Federal Environment Ministry and the German Federal Agency for Nature Conservation, the majority of German people associate nature with green, human-structured landscapes; however, forests, meadows, rivers, agricultural fields, or even gardens may be part of this landscape. What people in Germany value most is not "true wilderness" but rather a cultivated landscape so that wilderness is rarely sought out (BMU and BfN 2010 and 2012).

Europeans have an ambivalent relationship to wilderness (Van den Berg and Konijnendijk 2012). Wilderness represents the contrast to culture and civilization; it is a nature free of resident humans and it describes vast and coherent untouched landscapes, mountains, and rivers. Although many people are fascinated by and want to search for the "wild nature" they associate with freedom, pristine conditions, and natural renewal of resources (Hoheisel et al. 2010), the same – and other – people also exhibit negative emotions with the term *wilderness*. Some people do not feel comfortable with wilderness because they cannot accept their fears of unknown dangers (e.g., getting lost, being threatened by wild animals, having no shelter against adverse weather). Nature in this context is untamed and unpredictable.

The American use of a wilderness definition and concept differs significantly from the *Wildnis* concept in central Europe, where agriculture, horticulture, livestock, and forestry, persisting for thousands of years, have strongly influenced the way in which nature and wilderness are seen (SRU 2012).

The wilderness term (*Wildnis*) has no fixed meaning in Germany but rather is based on various ideas and definitions (SRU 2012) and is today used as a broad wild nature concept. Wilderness areas are landscapes where we find tranquility and loneliness (Trommer n.d.). The experience of wilderness differs among individuals and is embedded within cultural traits that provide a framework for the personal, emotional experience (Hoheisel et al. 2010). Wilderness designation delineates areas where no direct anthropogenic influence is observable, although former human activities have shaped the landscape and biota in more or less distant times. Wilderness even refers to areas within urban areas, where there is a low level of human interference (Kowarik 2005). The wilderness experience is influenced by the contemporary and local cultural background of each visitor (Hoheisel et al. 2010).

The wilderness experience depends on communication, information, and interpretation so that visitors will allow urban wild nature to become widely accepted as a counterpart to civilization. Wild nature may turn into a positive concept even among skeptical individuals and a desired component within the city, as many citizens have a rather limited range of nature experience. Wild nature would be best experienced in their own city or even the local neighborhood, where they feel safe and where they are part of a social community; such a strong focus on the local neighborhood is often found among

socially, educationally, or financially underprivileged people (DNR 2009).

If there is to be a halt to the loss of global biodiversity, there needs to be a message to the rapidly increasing urban communities about the importance of and services from biodiversity. These urban residents must be given the opportunity to get in touch with wild nature locally and experience biodiversity and natural processes without leaving the city. Through interpretative programs, these urban residents may observe, understand, and appreciate the dynamic processes of nature. A focus of such interpretive programs needs to be on people with small children or with little financial means, who are usually not able or willing to travel to any distant wild areas. While people experience urban wild nature, interpretive information may enhance their understanding of natural processes as well, which may raise awareness about the value of ecosystem services – as defined in the Millennium Ecosystem Assessment (WHO 2005). Nature with local biodiversity in an urban environment provides many nonmaterial benefits and has numerous recreational, spiritual, aesthetic, and intellectual values (Kaplan and Kaplan 1989; Fuller et al. 2007). Urban wilderness cannot only enhance psychological well-being and health (de Vries et al. 2003) but may also promote the value of ecosystem services of biodiversity such as urban climate regulation (Bowler et al. 2010), biological adaptation, or pollination of agricultural crops.

Figure 3 – Poster from BioFrankfurt Poster campaign. Translation: "Rhine-Main still is the natural habitat of the hazel dormouse. Only 1 out of more than 50 mammal species in Rhine-Main area. Biodiversity, biological diversity, meets us everywhere. Look closely and experience the region from a new perspective."

In 2014, Bio-Frankfurt Network for Biodiversity is part of an integrative project to promote the establishment of wild nature sites in the German cities of Frankfurt/Main, Dessau-Roßlau, and Hannover. The Bio-Frankfurt Network for Biodiversity is using different levels of communication to target various groups. For example, nature oriented groups will be provided with informational and educational tools to deepen their appreciation of the ecological and economic value of natural diversity, ecosystem services, and fauna and flora. For those individuals who are less interested in or reluctant to accept "wild nature," the communication strategy will focus on a more positive approach to the biological richness in the city, to making wilderness tangible as a space for recreation and adventure, and to representing ecosystem services of urban and suburban nature in a comprehensible way.

These efforts also make a contribution to biodiversity and wilderness conservation in rural areas and worldwide, and to an increase in public and political awareness about the necessity of wilderness conservation in the remaining biodiversity hotspots of the planet.

Great Challenges

It is an important need to create wild city areas and establish wise stewardship plans that appropriately manage the various users of the wild green areas – such as finding a balance between outdoor recreation visitors and "nature only" visitors. It may be necessary to establish zones in order to separate conservation areas from recreation areas. The aesthetic aspects of wild urban areas need to be considered; for example, minimal management should not result in unacceptable landscapes. A crucial aspect for public acceptance of wild areas will be to provide public access and access trails (Hofmann 2010). In addition, it could include cultural and art projects to increase public acceptance and to communicate with people that otherwise would not enter the areas.

A crucial strategy of the Bio-Frankfurt Network for Biodiversity will be to involve residents and stakeholders in the stewardship and management of these wild nature areas. It will be a challenge to get people emotionally involved and to help them to take ownership for the

Wild nature outside the urban sprawl is too far distant geographically for the majority of city dwellers because they spend their leisure time predominantly within the city limits or their local neighborhood.

project and to commit to a long-term involvement in the project.

Acknowledgments

This study was supported by Stiftung Flughafen Frankfurt/Main für die Region and cosupported by the Biodiversity and Climate Research Centre (BiK-F), Frankfurt a.M. (LOEWE – "Landes-Offensive zur Entwicklung Wissenschaftlichökonomischer Exzellenz" of Hesse's Ministry of Higher Education, Research, and the Arts).

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Announcements

COMPILED BY GREG KROLL

Ed Zahniser Retires

After 39 years of federal service, Ed Zahniser has retired from the U.S. National Park Service's Publications Group at Harpers Ferry Center for Media Services, Harpers Ferry, West Virginia. Son of the 1964 Wilderness Act's primary author, Howard Zahniser, Ed's publication career began as he accompanied his father to the company that printed *The Living Wilderness*, The Wilderness Society's magazine at the time. By age 9, Ed was running galleys from the presses to the proofing room, and by age 11 he was proofreading the magazine.

After his discharge from the U.S. Army as a Viet Nam–era draftee, Ed and his wife, Christine Duewel, moved to northern Ohio to help launch *The Mother Earth News*. Subsequently, he worked for The Wilderness Society as assistant editor of the magazine and editor of the membership newsletter. For more than a decade, as a powerful advocate for wilderness, Ed has served as a keynote speaker at interagency wilderness training sessions, national wilderness conferences, state wilderness advocacy groups, and colleges and universities.

South Korea Establishes Forest Therapy Bases

According to Dr. Won Sop Shin, secretary of forestry of the Republic of Korea and vice president of the International Society of Nature and Forest Medicine (INFOM), South Korea is establishing forest therapy bases similar to those being utilized in Japan. The forest therapy complexes, to be established in each of the seven different regions of Korea, will promote ecotourism and provide access to the restorative health benefits of interacting with the natural world. In addition to developing therapeutic programs and services and providing forest education, the complexes will include research centers that will study the therapeutic effects of the forest environment.

Since 2003, the Korean Forest Service has promoted a policy called "From Cradle to Grave: Life with Forests." It aims to provide the public benefits of forests to people of all ages and abilities, encompassing all life cycles, from prenatal to death. Open to the entire populace, it provides for camping, education, recreation, and tree burial services. INFOM was founded in Tokyo, Japan, in 2004. It is an interdisciplinary organization of researchers and practitioners striving to advance the use of nature as a holistic health-care treatment. INFOM encourages rigorous scientific research on the health benefits of spending time in nature so that healthcare providers can confidently make treatment recommendations that include natural settings. (Sources: http://hikingresearch.wordpress.com; www.infom.org)

"Traveling to the Wild South" Is Published

PAN Parks has announced that the first travel guide to wilderness in southern Europe has been released. Part of a series that will cover all the certified PAN Parks of the European continent, the first volume, *Traveling to the Wild South*, explores the best examples of that region's wilderness: Majella National Park (Italy) and Peneda-Gerês National Park (Portugal). The travel guide is designed as a practical and easy to use e-book. *Traveling to the Wild South* is available from Amazon US, Amazon UK, Amazon FR, Amazon IT, Amazon DE, and Amazon ES. (Source: www.panparks.org)

PAN Parks Launches The Million Project

PAN (Protected Area Network) Parks is a European nongovernmental organization that aims to protect Europe's most valuable wildlands by creating a network of parks throughout the continent. According to a PAN Parks press release, Europe's wilderness is not appreciated enough and faces the risk that without urgent action it will be lost forever. PAN Parks Foundation focuses its efforts on ensuring that European wilderness remains free from the footprint of human development. The foundation also coordinates with partner areas in improving their wilderness management techniques as well as identifying and eliminating some of the challenges inherent in long-term wilderness protection. To further its goals, the PAN Parks Foundation has launched The Million Project with the aim of safeguarding 1 million hectares (2.5 million acres) of European wilderness by 2015.

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

As of August 2013, The Million Project was well on its way to reaching its goal, with 801,000 hectares (2 million acres) protected in the European Wilderness Preservation System. In 2013, 10 new Wilderness Partners joined The Million Project, bringing to 19 the number of member countries within the geographical borders of Europe. (Source: www.panparks.org/what-we-do/the-million-project; www.panparks.org/newsroom/news/2013/getting-closer-to-1-million-hectares)

Belarus Partners with PAN Parks

Belovezhskaya Pushcha National Park, Belarus, has recently partnered with PAN Parks. It is the first, and so far the only, specially protected natural area of Belarus to be included in this international network. The park protects 57,000 hectares (140,000 acres) of primeval nature, out of a total of 150,000 hectares (370,000 acres) within park boundaries. To facilitate management, the park has been divided into four zones: 38% is the wilderness protection zone with the most strict protection regime, 26% is a regulated use zone, 31% is an economic activity zone, and 5% is a recreation area designed for tourism.

According to Vasily Arnolbik, deputy director general for science of Belovezhskaya Pushcha, Belarus has collaborated with Polish colleagues across its international border to compile a nomination for World Heritage status. According to the nomination, the proposed World Heritage zone would encompass 140,000 hectares (345,000 acres), including 80,000 hectares (200,000 acres) on the Belarusian side and 60,000 hectares (150,000 acres) on the Polish side. The combined area includes old-growth forests and unique wetland complexes.

Belovezhskaya Pushcha National Park is known for its ancient oak trees – some dating back more than 500 years. In addition to protecting nearly 900 species of trees and flowers, the park is home to more than 250 animal and bird species, including the largest population of the rare European bison, European wild horses, wolves, lynx, otters, and greater spotted eagles. (Sources: http://news.belta.by/en/news/society?id=716541;http://www.belarus.by/en/travel/belarus-life/belovezhskayapushcha)

New Transboundary World Heritage Site Inscribed in the Drakensberg Mountains

At a recent meeting of the World Heritage Committee, the uKhahlamba-Drakensberg Park, located in South Africa, and the Sehlabathebe National Park in Lesotho were inscribed as a transboundary World Heritage Site, with its new name, the Maloti-Drakensberg Park. The area is known for its spectacular natural landscapes and its wealth of rock paintings made by the San people over a period of 4,000 years. With a combined area of 249,313 hectares (615,000 acres), the Maloti-Drakensberg Park is the largest protected area along the Great Escarpment of southern Africa.

Located in southwestern KwaZulu-Natal Province, South Africa, and bordering the Kingdom of Lesotho, the park encompasses high mountains, steep-sided valleys, rocky gorges, and numerous caves and rock formations. The park contains the highest density of rock paintings in the world, with an estimated 600 rock art sites in caves and shelters and more than 35,000 individual images. Due to the large variety of habitats, more than 1,500 plant species and 300 bird species have been identified in the park. The highest peak, Thaba Ntlenyana, in Lesotho, rises to 3,482 meters (11,500 ft.) and is the 10th highest in Africa.

The transboundary park faces the threats of invasive alien plants as well as soil erosion of the fragile slopes caused mainly by unseasonal fires and overgrazing. In this remote mountain environment, it is particularly difficult to control illegal activities such as poaching and arson. The transboundary agreement between the two countries is a step toward more harmonious and effective management. The long-standing cooperation between South Africa and Lesotho is focused on building capacity to take advantage of the resource while developing an appropriate and sensitively planned tourism infrastructure that will ensure the long-term integrity of the environment while providing employment and entrepreneurial opportunities that benefit the peoples of both nations. (Source: www.iucn.org/news_homepage, July 25, 2013)

IUCN World Parks Congress Website Goes Live

The upcoming IUCN World Parks Congress, to be held in Sydney, Australia, in November 2014, has launched a new website: www.worldparkscongress.org. The site outlines the congress program, themes, and ways to get involved. It also provides background information on the IUCN and past congresses, and introduces next year's hosts and partners: Parks Australia and the New South Wales National Parks and Wildlife Service. According to the IUCN, the congress, whose theme is Parks, People, Planet – Inspiring Solutions, will bring together conservation professionals and a diverse group of participants, including business, youth, and the next generation of conservation leaders. The congress seeks "to take the next step towards a new benchmark for protected areas by positioning them within broader

social and economic goals." (Source: www.worldparkscongress.org)

USFS Publishes *Wild Child: A Resource Manual for Youth Wilderness Education Professionals*

Developed by the Wilderness Advisory Group of the U.S. Forest Service (USFS), *Wild Child* addresses the successes and challenges of promoting wilderness awareness in youth. Most recently updated in April 2013, the online document is directed at Forest Service employees but is relevant to all wilderness-managing agencies. Established programs are described as well as funding sources for youth wilderness education. Of great interest is the section titled "Challenges Faced in Promoting Wilderness Awareness in Youth," with such topics as "Wilderness Is Not Understood by the Agencies Administering It," "Overbearing Combination of Agency Safety Culture and Litigious Society", "Rigidity in Adhering to State Standards," and "Key Audiences Are Not Being Reached." (Source: www.fs.fed.us)

Judge Rejects Lawsuit over Montana Forest Plan

A federal judge has rejected a challenge to a U.S. Forest Service plan to bar motorized and mechanized vehicles in 322,000 acres (130,000 ha) of recommended wilderness in the Beaverhead-Deerlodge National Forest, Montana. The forest contains 1.8 million acres (730,000 ha) of roadless lands. Twenty-two plaintiffs sued the agency over its 2009 plan to ban the use of snowmobiles, off-road vehicles, and mountain bikes in parts of the southwestern Montana forest until Congress decides whether they should be afforded designated wilderness protection.

U.S. district judge Sam Haddon ruled the plaintiffs, led by two of the three Beaverhead County commissioners, did not meet the legal threshold to sue over two of their claims. According to the judge, the commissioners, who claimed the Forest Service did not properly consult with them as a cooperating agency, failed to prove they had suffered an injury for which they can sue. The judge also dismissed the plaintiffs' three other claims that the Forest Service violated the National Environmental Policy Act (NEPA) by failing to properly study the effects of banning motorized uses in those recommended wilderness areas. He stated that adding new acreage that was not considered in a draft environmental impact statement did not pose any new consequences requiring additional study.

Two environmental groups, the Greater Yellowstone Coalition and the Montana Wilderness Association, intervened in the lawsuit and were represented by Earthjustice. (Source: *Helena Independent Record*, July 22, 2013)

Russia Blocks Attempts to Establish Antarctic Marine Reserves

International talks on establishing huge marine reserves in Antarctica have failed to reach a consensus. At a meeting of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), attended by representatives of 25 countries, Russia blocked attempts to set up protected areas in the Ross Sea and Eastern Antarctica. The Russian representative challenged the legal basis that would allow for the creation of the reserves.

The CCAMLR is made up of countries with an interest in the Southern Ocean and includes Australia, the United States, the UK, China, and Russia. Any decisions taken require consensus among all parties. The meeting in Bremerhaven, Germany, was called to deal specifically with proposals for the establishment of reserves that would ban fishing and protect species including seals, whales, and penguins. If successful, the proposal would have more than doubled the area of the world's protected oceans. Proposed by the United States and New Zealand, 600,000 square miles (1.5 million sq. km) of the Ross Sea and 733,000 square miles (1.9 million sq. km) off the coast of East Antarctica would have been protected.

Andrea Kavanagh, director of The Pew Charitable Trusts' Southern Ocean Sanctuaries Campaign, said, "The actions of the Russian delegation have put international cooperation and goodwill at risk, the two key ingredients needed for global marine conservation. That we missed a critical opportunity to protect some of the most pristine ocean areas on Earth is a loss for the ecosystem and the international community." Kavanagh continued, "If nothing else this is pretty bad-faith negotiating, as the proponent countries have been going to Russia, talking to their scientists, inviting comments, inviting discussion – never once did Russia mention that it thinks this body might not have the legal authority to establish [Marine Protected Areas] … as it did in 2011 with a smaller area, in the South Orkney Islands, to which Russia agreed."

Fishing has been a major sticking point in the talks, with species such as krill and Patagonian toothfish proving highly lucrative for fisheries from a range of countries, including South Korea, Norway, and Japan. As a key element of the ecosystem, krill contribute to the diet of whales, penguins, seals, and seabirds. Demand for krill has risen sharply in recent years due to growing interest in omega-3 dietary supplements. (Sources: BBC News, July 16, 2013; Inter Press Service, July 15, 2013)

U.S. Veterans Pressure the White House and Congress for New Wildlands Preservation

Vet Voice, a four-year-old nonprofit that seeks to mobilize veterans for greater participation in the civic and democratic process, is pressuring Congress and the White House for more public lands protections. Veterans from wars in Iraq, Afghanistan, and Vietnam traveled to Washington to praise the Obama administration's recent designation of the Rio Grande del Norte National Monument in New Mexico and hope to build on that action for new designations and protections. "These are lands that we as veterans love, they are lands we defended overseas," said Mark Starr, program director for Vet Voice, based in Long Beach, California. Vet Voice representatives say that federal lands are important not just for the environment but also for veterans who turn to them as a place for mental and emotional renewal.

Nathan Cote, a Vietnam veteran and Democratic delegate to the New Mexico House of Representatives, says that getting outdoors helped him overcome post-traumatic stress disorder that still lingers. "When I started to get outdoors and active, that's when I quit self-medication," Cote said. "Replacing something that devastating with something so positive … the natural beauty and just being out there, it is a very positive thing to me." (Source: E&E Daily, June 4, 2013)

Streamer Lets You Navigate U.S. Watersheds with the Click of a Mouse

Streamer is a new online service from the National Atlas of the United States. It allows you to trace downstream along America's major rivers and streams simply by picking a point on a watercourse and mapping the route the stream follows. It also lets you trace the entire upstream watershed. Streamer (http://nationalatlas.gov/streamer/Streamer/welcome.html) allows you to

- locate your area of interest by specifying stream or place names or by entering latitude and longitude coordinates,
- enter the identification number for a U.S. Geological Survey streamflow gaging station,
- find out the names of streams and water bodies by clicking on them,
- print maps of your downstream and upstream traces,
- create concise or detailed reports for your upstream and downstream traces,
- learn about current or historic streamflow at thousands of locations along America's streams, and
- find out about the places your stream trace passes through with just a few mouse clicks.

NOLS Publishes Second Edition of *Wilderness Wisdom*

The National Outdoor Leadership School (NOLS) has recently published an expanded edition of its paperback book *Wilderness Wisdom: Quotes for Inspirational Exploration*. Edited by John Gookin, the book offers more than 1,000 quotes from close to 600 sources in categories ranging from leadership, diversity and inclusion, environmental ethics, and expedition planning in its 150 pages. It is small and light enough to carry in any backpack. The book is available in the United States from Amazon.com for less than nine dollars.

Continued from LONG TERM STUDIES OF CHANGE IN CAMPSITE CONDITIONS, page 18

Sequoia and Kings Canyon Nationa Parks was assessed by park research staff. All campsites were located and assigned to one of 273 different subzones; their condition was assessed on the basis of eight impact parameters: vegetation density, vegetation composition, total area of the campsite, barren core area, campsite development, litter and duff, social trails, and tree mutilations. In 2006 and 2007, to ascertain trends in impact, the campsite survey was repeated in 120 of the 273 subzones (44% of the wilderness). The most important finding of this study is that campsite conditions in the wilderness of Sequoia and Kings Canyon National Parks have improved dramatically since the late 1970s. Depending on assumptions and the comparability of the two surveys, aggregate campsite impact in 2006–2007 is almost certainly less than one-third what it was in the 1970s. No other wildernesses where trends in impact have been studied have improved so dramatically. But conversely, no other wildernesses studied had the high level of impact that existed here in the 1970s.

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Book Reviews

JOHN SHULTIS, BOOK REVIEW EDITOR

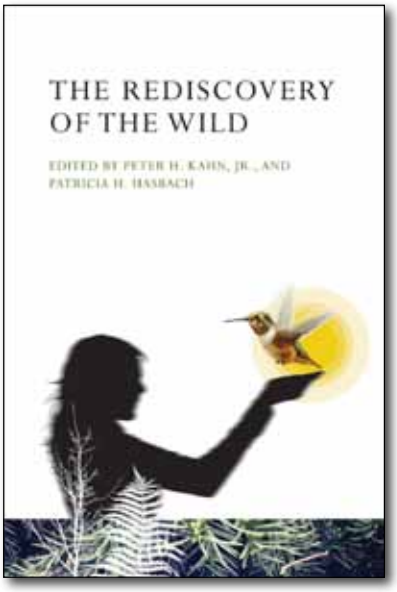
The Rediscovery of the Wild

Edited by Peter Kahn, Jr. and Patricia Hasbach. 2013. The MIT Press. 280 pp. $25.00 (pb).

The editors of this impressive volume have psychology backgrounds and have already published on issues relating to human connections with nature. While several of the 10 chapters in this book incorporate ideas from ecopsychology (G. A. Bradshaw) and evolutionary psychology (Ian McCallum), other writers come from different backgrounds, including anthropology (E. N. Anderson), biology (Cristina Eisenberg), and conservation (David Brower). Rather than creating a cacophony of voices, this range of perceptions, concepts, and ideas provides a fascinating, interdisciplinary blend of ideas that is a major strength of this book.

The focus of *The Rediscovery of the Wild* is also strengthened by its shared central premise. Rather than discussing the need to rewild nature, the authors argue that only by rewilding the human species can we truly create a healthy relationship with nature. Humans need to embrace their inner animal, rejoice in the wild that still lingers within us, and embrace the self-willed beings and behavior that exist all around us. As Jack Turner argues, "The idea that we have to go to Yellowstone to find or experience the wild is absurd. … Wildness is not limited to the human scale, our love for large fauna, and what we can see" (p. 43). He asks us to "learn to switch scales with ease," from the forces in the universe to the billions of bacteria that exist within each of us. Similarly, Bridget Stutchbury also suggests we increase "nature literacy" (p. 74) to enable people to better see the wildness around and in us, and Dave Foreman notes, "Wild things are also ecological and evolutionary processes, such as predation or pollination" (pp. 186–187).

This captivating book provides many challenges to "traditional" wilderness conservationists. For example, Turner's forceful chapter argues that the wilderness concept "appears dormant or even moribund" (p. 31) as it "seems encapsulated in a narrow conservation discourse that inhibits its conception" (p. 29). The authors suggest that while wilderness protection is important, the ultimate goal should be to ensure that we embrace the wildness that is found outside of wilderness areas. That is, new attitudes and values toward wildness – not just wilderness – are required for our species to exist in the foreseeable future. As E. N. Anderson argues, "Simple experience with nature, the wild, or even ordinary tame plants and animals is the clear place to begin, but it is never enough" (p. 173). This book suggests that examining the wildness that exists in and around us – from the microscopic to universe-level scales as well as within human behavior – is necessary to stave off ecological and psychological catastrophes. Rekindling our sense of wonder with the wild will not be an easy sell in a world seemingly content with for ease, comfort, and mindlessness, but The Rediscovery of the Wild dares us to pull the wilderness concept in new directions.



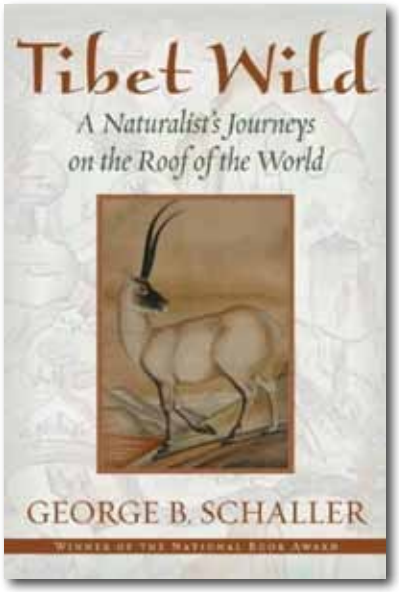
REVIEWED BY JOHN SHULTIS, book review editor for the IJW and associate professor at the University of Northern British Columbia (john.shultis@unbc.ca).

Tibet Wild: A Naturalist's Journeys on the Roof of the World

By George B. Schaller. 2012. Island Press. 384 pp. $29.95 (hc).

When I was a boy, I voraciously read any book about animals. I still remember the power that George B. Schaller's *The Year of the Gorilla* had on me: I immediately wanted to study animals in the wild like he did. Alas, a (losing) battle between me and chemistry in high school came between my dreams to become a field biologist, but perhaps Schaller's palpable concern for conservation helped convince me to study conservation instead.

Now in his 80th year, Schaller has more than 50 years' experience as a field biologist, explorer, and conservationist in many wild parts of the world. He describes himself as a throwback, "less a modern field biologist devoted to technology and statistics than a 19th-century naturalist who with pencil and paper describes nature in detail" (p. 5). In large part, this book reviews a lifetime of wildlife conservation, as the author openly questions his life's work; muses about how his remarkable childhood in warrravaged Germany in the 1940s shaped his character and his desire to roam in wild, remote areas; and expresses



his frustration at how bureaucracy, greed, ignorance, and superstition continue to extinguish animal populations even in remote areas such as the high Tibet Plateau.

Schaller has explored this remote region for more than three decades. Many chapters in this book – "part observation and part evocation" (p. 7) – reflect on his separate travels to different parts of Tibet to study wildlife, such as the Tibetan antelope (chiru), snow leopards, and pikas. But associated with his reports of the status of wildlife in various Tibetan regions, he outlines – with barely hidden frustration – the difficulty of conservation in these areas. He notes that "conservation is a long journey, not a destination" (p. 6) and reflects on the need for "patience and persistence above all" (p. 9). He also discusses his love-hate (mainly the former) relationship with fieldwork in the wilderness. On the one hand, he relishes the time spent in wild places, and revels in the solitude and stillness it provides: "Solitude provokes reflection and a study becomes a quest for meaning, not just of the animals but also of myself" (p. 190). On the other hand, he notes the hardships of fieldwork, especially in mountainous areas, the frustrations of working in foreign countries, and the time spent away from loved ones. Yet he also acknowledges that "I feel rootless, unconnected, always travelling in my mind on and on as if with a hunger that is never quite satisfied" (p. 194).

This book, then, provides remarkable insights into one of the greatest field biologists and conservationists of the last 100 years, as well as identifying the structure and status of conservation in regions such as the Tibetan Plateau. It paints a moving account of his successes and failures, persistence and patience, and of the joys and heartaches of travel in wilderness. It is comforting to still find the heart of a true wilderness and conservation champion in this outstanding book.

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

Continued from WILDERNESS HUMAN-WILDLIFE INTERACTIONS AND CONSERVATON PSYCHOLOGY, page 24

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Continued from COMMONALITY IN WILDERNESS CHARACTER, page 17

designation of small areas near modern civilization to be designated as wilderness – and therefore equal in standing to all other wilderness areas – was reaffirmed in the Eastern Wilderness Areas Act of 1975 (Public Law 96-622). Wilderness character acknowledges the differences between wildernesses without comparing them to one another; wilderness character doesn't provide means for comparison, only individual evaluation.

When used to evaluate a place, the five qualities of wilderness character help us understand it and in turn preserve it as wilderness. In this way, wilderness character bridges three elements: the unique features of wilderness area, the role of stewardship in preserving it, and the mandates of wilderness legislation. By bringing these elements together and monitoring wilderness character over time, we can understand changes and how the actions managers take – or do not take – affect wilderness preservation.

In the introduction, I referred to wilderness character as "the thread that ties all wilderness areas together." Each wilderness area is a thread with a unique color, and is woven together with all other wilderness areas to create a tapestry. In this tapestry, each thread exists as a component of the whole, but each also exists as a unique individual. We must see this tapestry for both its individual threads, and its entirety, because this is our National Wilderness Preservation System.

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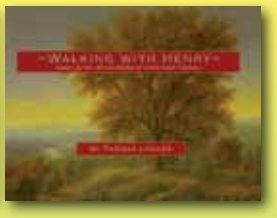

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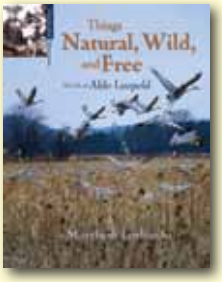

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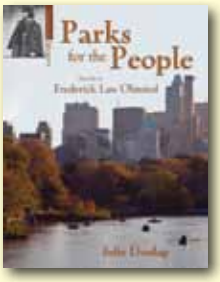

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