Traditional Wisdom and Climate Change

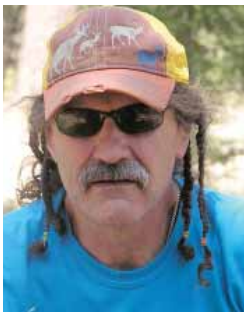
Contribution of Wilderness Stories to Adaptation and Survival

BY ALAN WATSON, LINDA MOON STUMPFF, and JENNIFER MEIDINGER

Our Wilderness Act in the United States, passed in 1964, provides a fairly distinct definition of wilderness for the part of society that was successful in parlaying their values, recreation motivations, and political influence into an extremely effective, world-recognized conservation program. But relationships with our National Wilderness Preservation System extend well beyond the typical recreation visitor we might encounter in these areas. For example, due to growing recognition of the downstream importance of protected headwaters of important rivers, and the need for climate change adaptive planning to protect the flow of benefits to humans from protected nature, wilderness science takes on new meaning to our society. In other words, not all relational aspects between wild places and some segments of U.S. society (particularly indigenous peoples) are described well in the 1964 Wilderness Act. To some degree, Alaskan wilderness areas do take into account rural peoples' rights and way of life under ANILCA, the Alaska National Interest Lands Conservation Act of 1980. However, recent research efforts toward understanding past and future relationships between humans and wilderness (e.g., Watson 2011) have included efforts to articulate perspectives of American Indians (Watson et al. 2011) and Alaska Native (Whiting 2004) people on their evolving relationships with large, relatively intact wild landscapes. This knowledge sheds light on an ancient cultural orientation toward North American wilderness, one different from that described in the 1964 Wilderness Act.

Knowledge is transferred to wisdom among traditional populations through interpreting storytelling into actions. Watson et al. (2003), Watson et al. (2011), and Turner and Clifton (2009) have emphasized the kincentric ecological principles described by Salmon (2000) that suggest indigenous people have traditionally most likely experienced the environment as a whole, that all the parts of the system are interrelated. Traditional knowledge can be seen as the quantitative information about these interrelationships that has accumulated across generations of people. In describing this knowledge, however, Turner et al. (2000) suggested that it is not easily subject to fragmentation, as we most commonly do in Western science approaches, including descriptions of wilderness attributes. Turner et al. (2000) proposed that traditional wisdom is acquired and demonstrated through understanding and maintenance of relationships with complex natural systems, such as wilderness, and that these systems are dependent on traditional knowledge to fully understand forces of change and likely response of the system. The dominant American cultural perspective on wilderness does not provide a universal, cross-cultural concept of conservation (Berkes 2008).

Tribal Nations have unique relationships with federal wilderness management agencies. Due to status conferred through sovereignty, time-honored legal, cultural, and



Alan Watson.

Linda Moon Stumpff.

Jennifer Meidinger.

historical connections and federal trust responsibility, engagement with American Indians and Alaska Native peoples require federal government-to-tribal government consultation during public lands decision making. President Barack Obama's Executive Memorandum on Tribal Consultation of November 5, 2009 (Obama 2009), confirmed the U.S. government's unique legal and political relationship with Indian tribal governments and directed heads of all executive departments to develop and implement tribal consultation plans on a strict time schedule. Hearings were held broadly in 2009 and 2010 to obtain input from the nation's 564 federally recognized tribes on new consultation policies. This recognition has important implications for efforts to protect relationships indigenous people have with public lands, including wilderness.

The purpose of this article is to emphasize to wilderness managers and planners the importance of recognizing how traditional knowledge about the environment is passed across generations of North American people and how the wisdom of applying this knowledge can help society in the overwhelming task of decision making to protect wilderness in the face of uncertainty, including the need to increase resiliency in the face of climate change.

Storytelling

Although one must be cautious about generalizing to all indigenous communities in North America, Bruchac (2003) suggested that stories have always been at the heart of all our Native cultures. Watson et al. (2011) contrasted tribal (storied) and nontribal (empty) perceptions of wilderness landscapes of the Mission Mountains Tribal Wilderness in Montana. Bruchac (2003) emphasized that Native stories about nature are not just myths or legends, as Western science might describe them. They are powerful tools for teaching cultural ethics. Stories open eyes to "a world of animals and plants, of earth and water and sky" (p. 35).

We must integrate the long-term knowledge of indigenous people into climate change adaptive planning, intervention, and mitigation efforts.

Although each indigenous nation or language group may have its different stories, there are commonalities that guide us in understanding past and current relationships with nature, and therefore appropriate future response to changes in natural forces such as climate change. In many traditional North American indigenous stories, for example of the Salish (McDonald 1973), the Shoshoni-Bannock (Heady 1973), the Penobscot (Edmonds and Clark 2003), the Cheyenne (Edmonds and Clark 2003), the Wintun (Lake-Thon 1997), the Seneca (Caduto and Bruchac 1997), and the Acoma (Edmonds and Clark 2003), Native people, or animal people on their behalf, have intervened to change difficult climatic conditions. Stories about the origin of summer and winter, water famines and floods, rivers, fire, medicine, and the sun and moon all involve one or more individuals traveling to the east, or up into the sky, to the south, or to another community to intervene on behalf of the people. Arrival of the seasons, creating river flows, fire, and even the sun and moon are attributable to intervention by those threatened by changes in natural forces. More important than the specific character who intervened on behalf of the people and animals, or the source of whatever it was that was created or stolen, is the fact that these stories convey a very different relationship with nature from that described in the U.S. Wilderness Act. In the act, there is advocacy for untrammeled natural forces. These indigenous stories all strongly support and teach human intervention *with respect* (Watson et al. 2003: Clarke and Slocombe 2009: Watson et al. 2011). Managers and planners must realize that although past dominant societal forces have influenced the landscape on adjacent Native Reservations and on homelands within parks and wilderness, both trammeled and untrammeled landscapes are different from those advocated through these traditional stories. Human intervention is a large part of the lesson, but so is respect for nature and its historical relationship with people (see fig. 1).

Climate Change and Indigenous People

There have been many studies, mostly since 2000 and in the extreme north where the effects have been felt strongest, of the impacts of climate change on Native people (Berkes 2008). Although traditional knowledge, or indigenous knowledge, played a very small role in development of the Intergovernmental Panel on Climate Change (IPCC) report, Berkes (2008) celebrates more recent climate change assessments such as the Millennium Ecosystem Assessment and the Arctic Climate Impact Assessment as based on scientific and indigenous epistemologies. Somewhat similar to recent efforts within the wilderness science community to emphasize the values of place-based research (i.e., science to identify unique experiences,

attributes, relationships, and threats to specific protected places for specific stakeholders), Berkes (2008) emphasizes the importance of place-based research to understand traditional knowledge contributions to climate change adaptation (e.g., Watson et al. 2007; Watson 2004; Glaspell et al. 2003; Patterson et al. 1998) .

Traditional Phenological Knowledge as described by Turner and Clifton (2009) refers to accumulated knowledge about seasonal timing of growth, development, reproduction, and migration of organisms, which generally occurs in a predictable sequence based on temperature thresholds, length of daylight, moisture, or other environmental determinants. Climate change uncertainties are likely to interfere with this knowledge, as described by Turner and Clifton (2009). In this case study, indigenous people's dependence on anticipated seasonal abundance of a specific resource and, in turn, its dependency on predictable climatic factors is illustrated through the impacts on harvesting edible seaweed and fish by indigenous people of British Columbia, Canada. Indigenous communities have adjusted to climate-induced impacts in the past by relocating settlements, temporarily or permanently; developing and imposing restraints on harvesting certain resources; sharing resources from family to family or across communities; seeking alternative resources; developing and using new technologies; and developing economic and social alliances – all strategies reflecting resilience and acceptance of both change and the need for intervention. These Native communities have dealt with changes in climate factors previously, and feel they need to be heard, their knowledge incorporated into intervention strategies, and that democratic approaches to policy decisions is their sovereign right (Grossman 2008).

Conclusions

Research has found that Earth's climate is changing, and that these changes are caused or increased by human activities (Leiserowitz 2010). Most people do not dread climate change (Weber 2006). The threats are slow, intangible, uncertain, and statistically documented but the changes mostly lie in the future, for most people, and are not caused by a hostile agent (Weber 2006). Among indigenous people, however, particularly in the northern lands, climate change is having profound effects on lifestyles, relationships with the land, and the meanings they attach to activities in natural landscapes (Whiting 2004). Dramatic changes are occurring. For example, many Alaskan Native villages face imminent threats from sea level rise. Although Native people do not necessarily have prior or "traditional" knowledge of specific climate changes, they do have sensitivity to critical signs and signals from the environment that unusual events and changes are happening (Berkes 2008).

Figure 1 – Dominant U.S. societal values prescribed intervention in fire management programs during the 20th century, but the important element of respect may have been overlooked and is now being restored in many landscapes. To restore the natural role of fire in wilderness may require intervention in many cases. Other intervention, in the face of climate change, may also be championed by indigenous peoples, but with respect. U.S. Forest Service photo.

Indigenous people have passed down stories about how they reacted in the past when this sensitivity to critical signs and signals from the environment suggested unusual events and changes. In these past cases, they, or significant symbolic animal-people, intervened to improve chances of survival and maintain crucial connections with the land on which they depended. Place-based research and local observations have a crucial role to play in research on environmental change (Berkes 2008). Berkes suggests an approach to understanding the effects of climate change that is not model driven, but is culture specific, historically informed, and geographically rooted.

Indigenous communities are increasingly realizing that survival of some aspects of their relationships with nature, and therefore their identity, rests in their ability to obtain power, exercise treaty and sovereign rights, and force democratic participatory approaches that allow them opportunity to intervene to build adaptive capacity in the face of uncertainty

connected to climate change (Grossman 2008). Clarke and Slocombe (2009) identified the goal of qualitative application of this knowledge as ecosystem resilience. Freeman (1999) identified respect and reciprocity as important elements in all indigenous resource management systems.

Park and wilderness managers are increasingly faced with participation in climate change vulnerability assessments on public lands and for communities dependent on public-lands resources. Climate change social vulnerability is a function of sensitivity to climate-related risks and the adaptive capacity to deal with those risks. Exposure sensitivity refers to susceptibility of a system to climatic conditions that represent risks. Adaptive capacity refers to the ability of individuals, households, communities, institutions, and so forth to address, plan for, or adapt to these risks (Ford and Pearce 2010). American Indians and Alaska Natives have unique exposure sensitivity, adaptive capacity, and resilience knowledge that can benefit adaptive planning. Wildcat (2009) describes the impact of climate change as the "fourth removal" of North American first peoples (i.e., indigenous people) and calls for immediate convergence of cultures to address climate change vulnerability issues.

In our rush to determine and invest in increasing adaptive capacity of our communities, we must not overlook the importance of connecting with indigenous communities and facilitating self-study to determine climate change exposure sensitivity that will drive adaptive capacity building. Whereas some human intervention is likely to be supported by most American Indians and Alaska Natives, the key element of respect must be considered. This raises uncertainty about how members of these sovereign nations will view adaptive planning by federal governments that includes genetic manipulation, large-scale restoration activities, or changes in agency policies toward fire, recreation, and access. For example, adaptation to climate change sometimes entails federal government proposals for introduction of new, disease- or drought-resistant genetic material and could involve other intervention aimed purely at sensitivity to climate change–induced or –aided change. Although in general human intervention to assure survival in the natural environment is acceptable to indigenous peoples, tribal members' knowledge about likely impacts of these interventions on traditional values or other ecosystem components have implications for respect, and must be considered in decisions. Federal government-to-tribal government consultation is likely to become a growing part of the wilderness planning process, and we must prepare agency planners to engage and plot a science direction (i.e., applying appropriate methodologies including place-based, traditional knowledge capture) to provide the knowledge needed for sound, adaptive plans.

Corbyn (2011) advocates respect for both scientific and traditional knowledge by expanding tribal research capacities to help protect traditional values while forging a new future. This approach has been described as "an act of resistance" by tribal colleges (quote by Luana Ross, President of Salish Kootenai College in Montana, in Corbyn 2011). Native people are taking control of the research process on matters that affect them, as it should be. Greater engagement of Native people in climate change sensitivity assessment and adaptive capacity building for all U.S. wilderness is essential. Ultimately, climate change impacts and imposed mitigation activities on indigenous people in the United States can be considered an environmental violation of treaty rights in many cases (Grossman 2008). For both ethical and applied reasons, we must integrate the long-term knowledge of indigenous people into climate change adaptive planning, intervention, and mitigation efforts (Magzul 2009; Krupnik and Ray 2007).

References

Berkes, F. 2008. *Sacred Ecology*. New York: Routledge.

Bruchac, J. 2003. *Our Stories Remember: American Indian History, Culture, and Values through Storytelling*. Golden, CO: Fulcrum Publishing.

Caduto, M. J., and J. Bruchac. 1997. *Keepers of the Earth*. Golden CO: Fulcrum Publishing.

Clarke, D. A., and D. S. Slocombe. 2009. Respect for grizzly bears: An aboriginal approach for co-existence and resilience. *Ecology and Society* 14(1): 42. Available at www.ecologyandsociety.org/vol14/iss1/art42.

Corbyn, Z. 2011. Research on the reservation. *Nature* 471: 25–26.

Edmonds, M., and E. E. Clark. 2003. *Voices of the Winds: Native American Legends*. Edison, NJ: Castle Books.

Ford J. D., and T. Pearce. 2010. What we know, do not know, and need to know about climate change vulnerability in the western Canadian Arctic: A systematic literature review. *Environmental Research Letters* 5(2010) 014008. UK: IOP Publishing Ltd.

Freeman, M. M. R. 1999. Respect and reciprocity as key elements in Arctic sustainable use strategies. In *Tenure and Sustainable Use*, ed. J. Oglethorpe (pp. 88–99). Gland, Switzerland: IUCN.

Glaspell, B., A. Watson, K. Kneeshaw, and D. Pendergrast. 2003. Selecting indicators and understanding their role in wilderness experience stewardship at Gates of the Arctic National Park and Preserve. *George Wright Forum* 20(3): 59–71.

Grossman, Z. 2008. Indigenous nations' responses to climate change. *American Indian Culture and Research Journal* 32(3): 5–27.

Heady, E. B. 1973. *Sage Smoke: Tales of the Shoshoni-Bannock Indians*. Chicago, IL: Follett Publishing Co.

Krupnik, G., and G. Ray. 2007. Pacific walruses, indigenous hunters, and climate change: Bridging scientific and indigenous knowledge. *Deep-Sea Research II* 54: 2946–2957.

Lake-Thon, B. 1997. *Spirits of the Earth: A Guide to Native American Nature*

Symbols, Stories, and Ceremonies. New York: Penguin Group.
Leiserowitz, A. 2010. Public understanding of climate change. National Research Council. Available at www7.nationalacademics.org/hdgc/Session_Moderator_Public%20Understanding_of_Climate_change_Anthony_Leiserowitz.pdf.
Magzul, L. 2009. The Blood Tribe: Adapting to climate change. *Prairie Forum* 34(1): 289–309.
McDonald, W. H. 1973. *Creation Tales from the Salish*. Montana Indian Publication Fund. Billings, MT: Montana Reading Publications.
Obama, B. 2009. Memorandum for the heads of executive departments and agencies. Subject: Tribal consultation. Retrieved February 13, 2012, from www.whitehouse.gov/the-press-office/memorandum-tribal-consultation-signed-president.
Patterson, M. E., A. E. Watson, D. R. Williams, and J. R. Roggenbuck. 1998. An hermeneutic approach to studying the nature of wilderness experiences. *Journal of Leisure Research* 30(4): 423–452.
Salmon, E. 2000. Kincentric ecology: Indigenous perceptions of the human-nature relationship. *Ecological Applications* 10(5): 1327–1332.
Turner, N. J., M. B. Ignace, and R. Ignace. 2000. Traditional ecological knowledge and wisdom of aboriginal peoples in British Columbia. *Ecological Applications* 10(5): 1275–1287.
Turner, N. J., and H. Clifton. 2009. "It's so different today": Climate change and indigenous lifeways in British Columbia, Canada. *Global Environmental Change* 19: 180–190.
Watson, A., L. Alessa, and B. Glaspell. 2003. The relationship between traditional ecological knowledge, evolving cultures, and wilderness protection in the circumpolar north. *Conservation Ecology* 8(1): 2–21.
Watson, A. E. 2004. Human relationships with wilderness: The fundamental definition of wilderness character. *International Journal of Wilderness* 10(3): 4–7.
Watson, A. E. 2011. The role of wilderness protection and societal engagement as indicators of well-being: An examination of change at the Boundary Waters Canoe Area Wilderness. *Social Indicators Research*, DOI 10.1007/s11205-011-9947.
Watson, A., B. Glaspell, N. Christensen, P. Lachapelle, V. Sahanatien, and F. Gertsch. 2007. Giving voice to wildlands visitors: Selecting indicators to protect and sustain experiences in the eastern Arctic of Nunavut. *Environmental Management* 40: 880–888.
Watson, A., R. Matt, K. Knotek, D. R. Williams, and L. Yung. 2011. Traditional wisdom: Protecting relationships with wilderness as a cultural landscape. *Ecology and Society* 16(1): 36.
Weber, E. 2006. Experience-Based and Description-Based Perceptions of Long-Term Risk: Why Global Warming does not Scare us (Yet). *Climate Change* 77: 103-120.
Whiting, A. 2004. The relationship between Qikiktagrugmiut (Kotzebue tribal members) and the Western Arctic Parklands, Alaska, United States. *International Journal of Wilderness* 10(2): 28–31, 8.
Wildcat, D. R. 2009. *Red Alert: Saving the planet with indigenous knowledge.* Golden, CO: Fulcrum Publishing.

ALAN WATSON is a research social scientist at the Aldo Leopold Wilderness Research Institute, USDA Forest Service, Rocky Mountain Research Station, 790 E. Beckwith Ave., Missoula, MT 59801, USA; email: awatson@fs.fed.us.

LINDA MOON STUMPFF is a faculty member at The Evergreen State College, 2700 Evergreen Parkway, Lab One, Olympia, Washington 98505, USA; email: stumpffL@evergreen.edu.

JENNIFER MEIDINGER is a University of Montana Climate Change intern at the USDA Forest Service, Rocky Mountain Research Station, 790 E. Beckwith Ave., Missoula, MT 59801, USA.

Continued from THE DIVERSITY OF WILDERNESS, page 20

resources. To provide an inventory of these resources, the Protected Areas Database program for the United States is being improved to help in describing ownership and protection status across the country. This effort is important because the United States is losing about 2 million acres (809,715 ha) of forest, farm, and other open space each year. Pushing against this tide of open land loss, there is a rise in the nongovernmental land trust movement and the land protection that results. In addition, between 1998 and 2005, state governments conserved 8.6 million acres (3.48 million ha) of land and spent $13 billion for its protection (Cordell et al. forthcoming). The ecosystem protection challenge is large, but perhaps some of this rising interest in protection of natural lands will be increasingly effective. Perhaps we will see continued support for more wilderness designation. I, for one, am hopeful this will be the case.

Acknowledgments

Shela Mou, Forest Service, Athens, Georgia, provided data acquisition, ArcGIS analysis, and mapping. Carter Betz, Forest Service, Athens, Georgia, provided data validation and review. Appreciation is extended to the blind reviewers for the source RPA publication on which this article is based.

References

Bailey, Robert G. 1976. Ecoregions of the United States (map). Ogden, UT: United States Forest Service, Intermountain Region. 1:7,500.00 colored.
———. 1995. Description of the ecoregions of the United States. Retrieved November 8, 2011, from www.fs.fed.us/land/ecosysmgmt/index.html.
———. 2009. *Ecosystem Geography: From Ecoregions to Sites*. New York: Springer Publishing.
Cole, David N. 2008. Wilderness, protected areas and climate change. May 20. Retrieved October 26, 2011, from www.fs.fed.us/ccrc/topics/wilderness.shtml.
Cordell, H. Ken, Carter J. Betz, J. M. Bowker, Donald B. K. English, Shela H. Mou, John C. Bergstrom, R. Jeff Teasley, Michael A. Tarrant, and John Loomis. 1999. *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends*. Champaign, IL: Sagamore Publishing.
Cordell, H. Ken, Carter J. Betz, and Stanley J. Zarnoch. (Forthcoming). Recreation and protected land resources in the United States: A technical document supporting the Forest Service 2010 RPA Assessment.

Continued on page 38