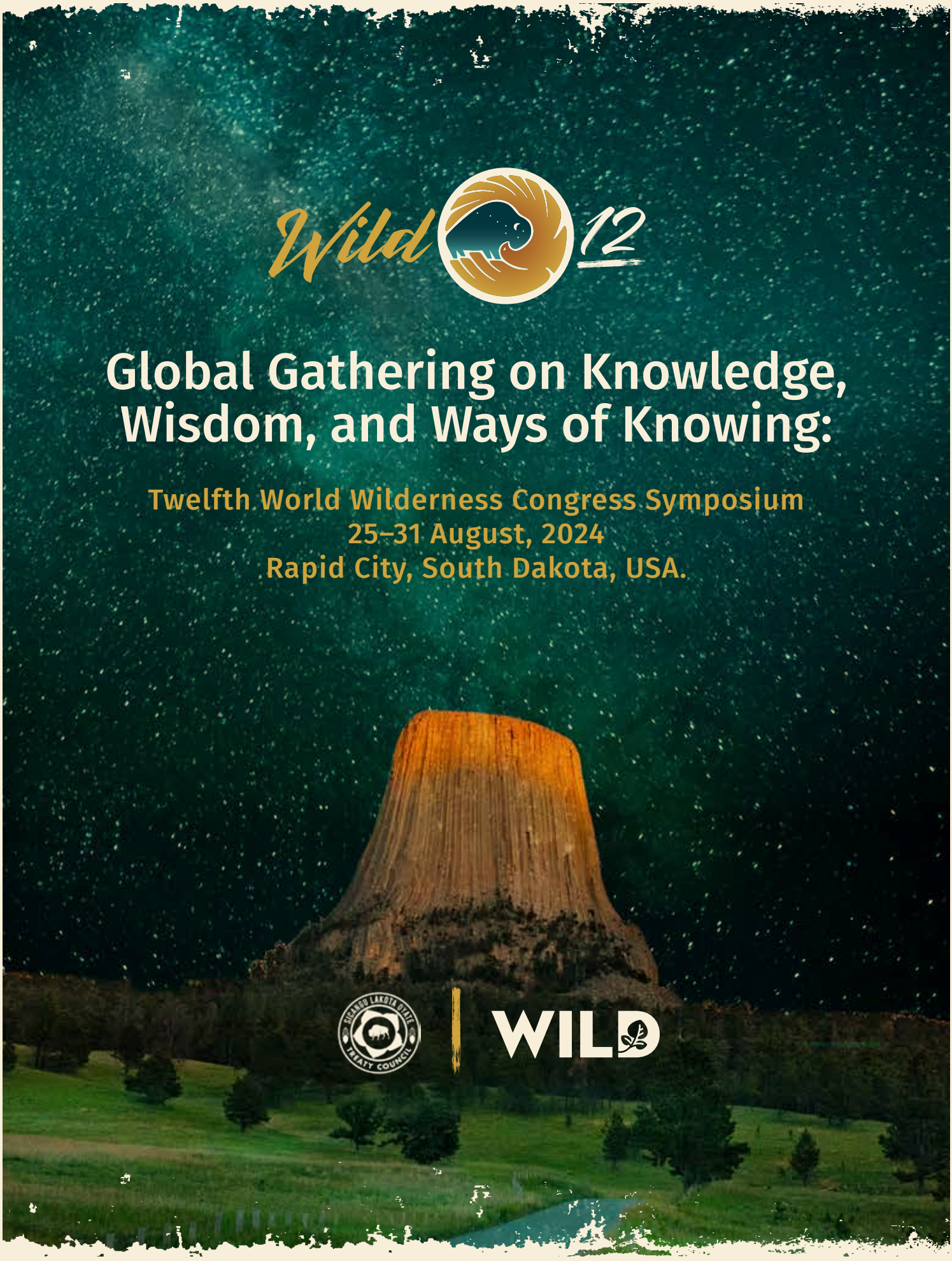

Wild 12
Global Gathering on Knowledge, Wisdom, and Ways of Knowing:
Twelfth World Wilderness Congress Symposium
25–31 August, 2024
Rapid City, South Dakota, USA.
OYATE
TREATY COUNCIL
WILD

In: Dvorak, Robert; Tin, Tina; Armatas, Christopher; Carver, Steve, comps. 2026. Global Gathering on Knowledge, Wisdom, and Ways of Knowing: Twelfth World Wilderness Congress symposium; 2024 25–31 August, Rapid City, South Dakota, USA. WILD Foundation, 253 pp.

Abstract

The Twelfth World Wilderness Congress (WILD12) met in Rapid City, South Dakota, USA in 2024. The global gathering on knowledge, wisdom, and ways of knowing was one of the largest symposia held in conjunction with the Congress. This symposium was organized and sponsored by the WILD Foundation, the Aldo Leopold Wilderness Research Institute, Elouise Cobell Land and Culture Institute, Global Center for Indigenous Leadership and Lifeways, IUCN World Commission on Protected Areas, and Wilderness Foundation Global. The papers contained in these proceedings were generated at this symposium, but not all authors submitted papers for consideration for inclusion in these proceedings. They have been organized into four major sections: (1) Indigenous Perspectives & Global Stewardship, (2) Rewilding, Values, Meanings, and Relevance of Wilderness, (3) Methods and Approaches for Managing Social and Ecological Systems, and (4) Collaboration, Partnership, and Community Conservation. Included are papers that address wildland issues on all continents, but wilderness designation, protection and restoration processes and challenges vary tremendously from North America to Europe and from Antarctica to Africa, thus sections are defined by geography and topic.

Keywords: wilderness, rewilding, Indigenous knowledge, ecological benefits, cultural meanings, community conservation, protected areas, economics, tourism, stewardship, education.

Preface

The Twelfth World Wilderness Congress (WILD12) met in Rapid City, South Dakota, USA in 2024. WILD12 brought together indigenous leaders, conservation professionals, and wilderness advocates from 36 countries, including representatives from over 50 Tribes and Indigenous Nations.

WILD 12 was notable as one of the largest international conservation congresses hosted by Indigenous peoples, with Indigenous perspectives on wilderness playing a central role. Discussions included co-stewardship, methods and approaches to wilderness management, rewilding, restoring and connecting social and ecological systems, and storytelling.

The Congress took place in He Sápa, the Black Hills, the sacred territory of the Lakota Nation. The Sicangu Lakota Treaty Council invited the world to the Black Hills to reimagine wilderness through the lens of traditional cultural knowledge.

The first meeting of the World Wilderness Congress was in South Africa in 1977, followed by meetings in Australia (1980), Scotland (1983), the United States of America (Colorado) in 1987, Norway (1993), India (1998), again in South Africa in 2001, again in the United States of America (Alaska) in 2005, Mexico in 2009, and Spain in 2013.

The papers included in these proceedings do not represent all of the oral and poster presentations of the Global Gathering on Knowledge, Wisdom, and Ways of Knowing. It has been tradition, however, to gather many of those papers and compile them as a partial record of what transpired during these concurrent sessions. Other papers from the Global Gathering have also been published in other outlets. Every paper in these proceedings received peer review and editing by at least two of the compilers. The Aldo Leopold Wilderness Research Institute, the WILD Foundation, and the Wildland Research Institute of the University of Leeds are proud to cooperate in compiling, publishing, and distributing this publication. The compilers also extend special thanks to the WILD Foundation, and to Adam Hanson in particular, for leadership in coordinating facilities, schedules, and support for many aspects of the Global Gathering.

The Compilers, July 2026

In Recognition

Victor Douville

Honorary Chair

The organizers extend their deepest appreciation to **Victor Douville,** Professor of Lakota Studies and Cultural Coordinator at Sinte Gleska University, PhD; Honorary Chair of the WILD12 Symposium: *Global Gathering of Knowledge, Wisdom, and Ways of Knowing*. Through his leadership, generosity, and lifelong commitment to Lakota history, culture, and education, he helped ground the symposium in respect for He Sápa (the Black Hills) and for the spiritual and cultural relationships that Indigenous Peoples hold with place. His guidance helped ensure that Indigenous voices, responsibilities, and perspectives were central to the gathering's purpose and to deeper understandings of wilderness, stewardship, and relationship with the living world.

Greg Cajete

Chair of Native Science

The organizers gratefully acknowledge **Greg Cajete,** Former Director of Native American Studies and an Emeritus Professor in the Division of Language, Literacy, and Sociocultural Studies in the College of Education at the University of New Mexico, PhD; Chair of Native Science, for bringing decades of scholarship, teaching, and wisdom to the symposium. His work demonstrated the value of Indigenous ways of knowing in understanding ecological relationships, cultural continuity, and responsibilities to land, community, and future generations.

Cherryl Curry

Ilarion Kuuyux Mercuilieff

Jo Roberts

Shay Sloan Clarke

Convening Chairs

We offer sincere thanks to the Convening Chairs: **Cherryl Curry, Ilarion Kuuyux Mercuilieff, Jo Roberts, and Shay Sloan Clarke**, whose vision, care, and dedication brought together Indigenous leaders, researchers, practitioners, and students from around the world to engage in meaningful dialogue across cultures, disciplines, and generations.

Chris Armatas

Steve Carver

Bob Dvorak

Zdenka Křenová

Vicki Sahanatien

Fernando Sanchez

Jason Taylor

Tina Tin

Organizing Chairs

Special recognition is extended to the Organizing Chairs: Chris Armatas, Steve Carver, Bob Dvorak, Zdenka Křenová, Vicki Sahanatien, Fernando Sanchez, and Jason Taylor. Their collective leadership guided the development of the symposium's themes, sessions, and scholarly contributions. Through hours of planning and coordination, they helped create a program that welcomed diverse voices and perspectives while maintaining a strong commitment to excellence and practical conservation outcomes.

The organizers also wish to recognize the Symposium Proceedings Chairs: Bob Dvorak, Tina Tin, Chris Armatas, and Steve Carver, for their commitment to preserving and sharing the knowledge generated through WILD12. They ensured that the insights, stories, and lessons emerging from this gathering will continue to inform wilderness stewardship and future generations of scholars and practitioners.

Together, these leaders and volunteers helped make the Global Gathering of Knowledge, Wisdom, and Ways of Knowing a cornerstone of the 12th World Wilderness Congress—advancing dialogue, fostering collaboration, and contributing to a global vision for wilderness.

Adam Hanson

WILD12 Deputy Executive Organizer

The organizers extend their deepest appreciation and gratitude to Adam Hanson, Deputy Executive Organizer for WILD 12 and Managing Director of Global Conservation Networks for the WILD Foundation. Adam was an integral part of all facets of WILD12, providing leadership, humility, and passion for the Global Gathering. His enthusiasm for bringing people together to share unique perspectives and hear diverse voices created an atmosphere for success that would not have been possible without his efforts. We are all very grateful for his dedication and commitment to WILD12.

Contents

Section 3—Methods and Approaches for Managing Social and Ecological Systems

Section 4—Collaboration, Partnership, and Community Conservation

Appendix A—12th World Wilderness Congress Resolutions

Resolution 1: On Sovereignty and Wilderness: Deepening the Wilderness Concept Through Indigenous Knowledge and Wisdom

Resolution 2: Through the Eyes of Buffalo: A Strategic Platform to Restore All Natural World Relationships

Resolution 3: Advancing the Rights of Antarctica

Resolution 4: Mainstreaming Mentorship of Young Ecological Stewards

Resolution 5: Indigenous Law and Guardianship of Nature

Resolution 6: Ratify the High Seas Treaty

Resolution 7: Making Space to Protect White Animals, Messengers of Peace

Resolution 8: Empowering Ecological Outcomes by Honoring Treaties

Resolution 9: Urgent Mineral Withdrawal for all of the Black Hills

Resolution 10: Recognition of Central Mexico's Forest of Water as a Strategic Region for the Viability of Central Mexico's Megalopolis

Resolution 11: Metaphysical Activism

Resolution 12: Protecting the Sámi Forest: Safeguarding Biodiversity and Indigenous Livelihoods

Section 1

Indigenous Perspectives & Global Stewardship

Through a Tribal Lens:
Understanding Tribal Wilderness Values and Emerging Strategies for Protecting Wildlands

BY LINDA MOON STUMPFF

reprinted with permission from Holmes et al 2022, GTR WO-101

Abstract

This paper explores the context for deep cultural meaning and values embedded in place in tribal wildlands. The cultural history of Taos Pueblo and the cultural values manifest in Blue Lake Wilderness and other tribal wilderness and wildlands are described. Indigenous values related to the natural world and specifically wildlands overlap with those of federally designated wilderness, but differences exist at the foundational level for understanding human relationships to ecological and cultural landscapes. Greater levels of trust and collaboration between Tribes and wilderness managers are emerging offering alternatives and enriching wilderness management ways to expand the scope of desirable future wilderness conditions and the means to attain them.

Introduction

Exploring Tribal values associated with Tribal wildland and wilderness protection reveals a history of change and evolving opportunities for collaboration. Tribal wilderness values are symbolic of the deep concerns for the quality of water and watersheds expressed by American Indian Tribes across the country from Standing Rock to Hopi, and from the Skokomish to the Nisqually Tribes on the Northwest Coast (Stumpff 2013). Several studies discuss the unique land and water values demonstrated by Tribes (Armatas et al. 2017; Cajete 2000; Krahe 1995; Watson et al. 2003, 2012, 2014), and it is important to understand that many of the 567 federally recognized American Indian and Alaska Native Tribes hold diverse cultural preferences, perspectives, and applied uses regarding wildlands and waters on American Indian trust lands. Further, Tribal cultural values are not limited to Tribal trust lands, but are carried into relationships with Federal, State, and local lands. This paper explores those values through Tribal relationships with wildlands and wilderness so that specific examples illuminate Tribal values related to the lands.

The historic and current struggles of Taos Pueblo in northern New Mexico to protect its sacred wilderness values in the Blue Lake Wilderness are a primary subject of this study. This approach provides the opportunity to understand the emergence of Tribal values in the policy process and finally in Tribal wilderness and wildland management. The case study method is used to explore the context for deep cultural meanings and values that are embedded in place (Basso 2011; Yin 2013). It is a study of wild places and of the values attached to them, expressed through a historic struggle that began in the 1600s. The enormous strength of Taos Pueblo wilderness

Linda Moon Stumpff *is faculty, active emerita for the Tribal Governance Master of Public Administration and Master of Environmental Studies Programs, Evergreen State College; Retired National Park Service and USDA Wilderness Manager; Co-Director of Enduring Legacies Native Case Study Initiative and independent research.*

values is evident in the actions, strategies, and wilderness policy positions when the 400 plus-year battle to protect Blue Lake Wilderness is examined. Truly, this example shows that the Taos Pueblo's Blue Lake Wilderness Area, often referred to as the Blue Lake Wilderness, was the subject that long ago captured the people's hearts. The tenacity with which the Taos Pueblo held to these values over the centuries-long effort illustrates how deeply their religious and cultural values were held.

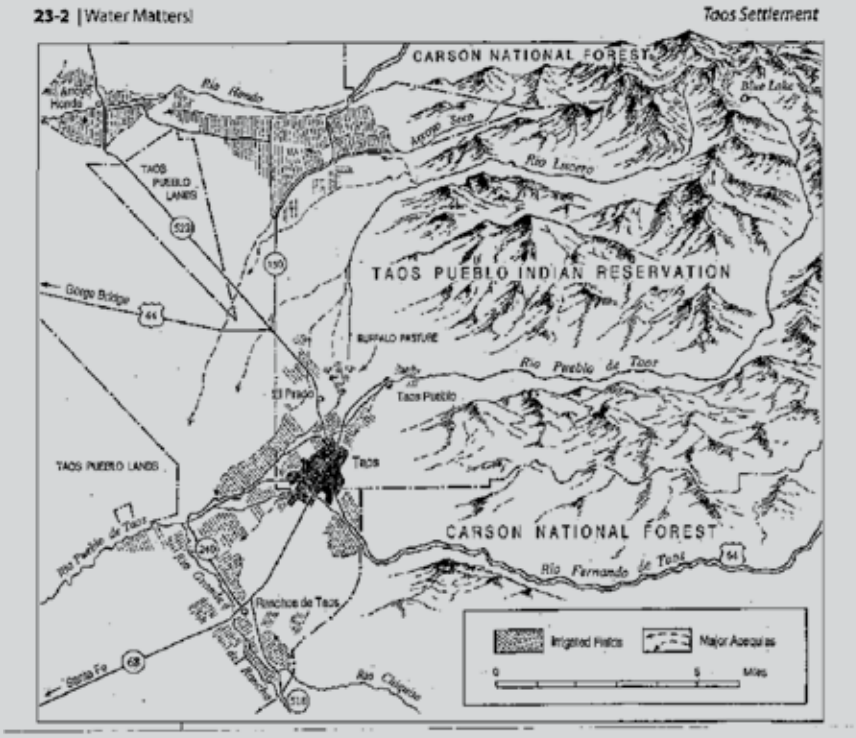


Figure 1 - Map showing Taos Pueblo.

This discussion begins by providing an overview of the cultural landscape of the Taos Pueblo. This is followed by a description of the struggles endured by the Taos Pueblo in their efforts to protect the sacred Blue Lake Wilderness. Within this framework, the cultural values manifest in the protection of the Blue Lake Wilderness are then described. Brief sketches of other approaches to wilderness preservation by the Sandia Pueblo and the Confederated Salish and Kootenai Tribes are presented. The final section of the paper offers a comparison of how Tribal values are expressed through various governance regimes including cooperative management, co-management, Tribal management, and special relationships. This work seeks to contribute to greater cooperation and understanding as planning for new wilderness and protected wildland areas continues and areas are established to increase opportunities for co-management protections for connecting wildlands over larger land and watershed areas.

The use of the terms wildness and wilderness as applied to tribal context in this paper represents the values and management modalities of specific Tribes. Several different kinds of wilderness regimes representing choices made by different Tribes are covered here. Tribes have the legal and political sovereignty to define the terms within their lands. The Wilderness Act and its definitions do not apply on tribal lands. Tribal trust lands are not public lands: they are lands held in trust by the Department of the Interior for the benefit of Tribes as homelands. Tribes can make decisions about conserving lands through their own legislative systems and elected

officials. A few Tribes maintain traditional methods of governance, which are specific to that Tribe. Tribal natural resource and environmental departments are staffed by qualified professionals often with graduate degrees and/or formal certifications who also have cultural knowledge or understand how to locate those with cultural knowledge. Decisions are informed through both democratic institutions like public meetings, discussions with internal and external experts and surveys, and also by traditional means like councils of elders. The Wilderness Act, which places a strong emphasis on recreation does not apply on sovereign tribal lands. Tribes have considerable expertise in balancing values, and many offer a range of recreational opportunities in places and times that are compatible with their values. Tribal sovereignty, backed by the Constitution and subsequent congressional legislation, means that Tribes can apply their own decisions with regard to making land use decisions like setting lands aside for the purpose of preserving wild values as defined by a Tribe. Each Tribe may make the decisions based on specific values. Thus, there is no real tension between recreational values and wilderness conservation values on tribal lands. The Tribe makes the decision about the values it prioritizes based on their cultural values and community interests. The tribal decision process is not subject to external stakeholder or a national process, so tension between recreation values and religious or specific conservation values is uncommon. Tribes do complete decision processes under the National Environmental Policy Act, but they do so under specific federally-approved rules and the public process is confined to the Tribes due to sovereignty. For example, the Mescalero Apache Tribe has a recreational ski operation on a sacred mountain. In this case, the Tribe decided to design the ski resort and specific land use in ways that do not violate specific cultural and sacred areas. In fact, most tribal wilderness areas do provide for recreational use, but it may be limited seasonally or for specific tribal objectives like protection of certain species like the grizzly bear. In some cases where religious use of sacred sites is the dominant value, then recreation is not a value. It is a question of designing a wilderness design that responds to tribal values of a specific Tribe.

Tribal values do not always align with definitions and management modalities applied to designated wilderness on federal lands. The Wilderness Act encompasses a dual mission to provide for recreation and to conserve wilderness as defined in the Act. This sets up a potential tension on federal lands where public demands for recreation may push against wilderness values and wilderness character. This tension is uncommon in tribal wilderness decisions due to tribes' sovereignty and governance systems that incorporate traditional values and partly because national and local organizations promoting recreation are not part of the decision process. Tensions can appear when Tribes collaborate in the management of federally designated wilderness lands.

Tribes and federal agencies have achieved useful collaboration over adjacent areas, such as between the Bob Marshall Wilderness and Salish and Kootenai's Tribal Wilderness. Despite some differences with tribal modalities, both regimes recognize high recreation values. In the case of the Taos Pueblo Wilderness, the dominance of religious values resolves any tension with recreational values and use for the Tribe. However, it can produce tension with adjacent federally designated wilderness use on Forest Service lands because users of Forest Service wilderness lands may move past the boundaries onto Taos Pueblo lands. Active patrols are necessary to resolve the tension so wilderness users are aware of the boundaries and tribal rights. Despite differences, collaboration between Tribes and federal land managers can serve shared values as examples in this paper will show. In 2025, the Bureau of Land Management signed a co-stewardship agreement with the Tohono O'odham Tribe for the Baboquivari Peak Wilderness and the Coyote Mountains Wilderness in Arizona. In this case, the federal agencies agreed that traditional knowledge will be used to enhance management of the federally designated wilderness areas and to set up a good system of communications including continuous meetings as they seek to define best practices. In return, the Tribes get a seat at the table for lands of deep cultural and ecological significance.

Tribal Wilderness: Place, Time, and Values

The following short case study tells the story of the Taos Pueblo's struggle to protect the Blue Lake Wilderness. For the people of Taos Pueblo, Tribal wilderness values encompass both the sacred qualities of resources such as Blue Lake while also recognizing the essential contributions that wild ecosystems provide for the sustenance of life. Tribal values attached to place, Tribal commitment to values over the long term, and the emergence of their values in relationships and agreements provide a basic framework for revealing the nature and the content of those values.

The Northern Rio Grande and Taos Pueblo Cultural Landscape

The Taos rift valley rises in northern New Mexico encircled by lakes, streams, and rivers that pour from mountain wildernesses to support wildlife, agriculture, cultural activities, and tourism. The Rio Grande originates as a small waterway in Colorado that is enlarged by the web of tributaries flowing from the Sangre de Cristo Mountains in New Mexico. It runs all the way to Brownsville, TX, to pour what is left (if anything) of its much-used waters into the Gulf of Mexico.

Taos Pueblo is located within the northern watershed of the Rio Grande (fig. 1). It sits at the base of Taos Mountain with access to clean and abundant water that flows from the wilderness lands in the high country above. Blue Lake, hidden in a basin 20 miles from the Pueblo behind Taos Mountain, is the Pueblo's great treasure and its source of water. It sits in a glacial cirque at 11,000 feet and is the main source of the Rio Pueblo, a tributary of the Rio Grande that is vital for drinking and traditional agricultural water. The entire watershed is considered a sacred site by the Pueblo (Ebright et al. 2014). The area is dotted with shrines and sites for religious activities such as sacred closed ceremonies and pilgrimages that take place within the watershed. The Pueblo landscape opens to mountain and sagebrush vistas, mostly managed by federal agencies. Wheeler Peak, the 13,161-foot mountain and the highest point in New Mexico, towers in the background. Forested watersheds surrounding it create a unique, productive, and beautiful setting for the Pueblo.

In addition to Blue Lake Wilderness, three Federal wilderness areas—the Pecos (221,806 acres), the Wheeler Peak (19,154 acres), and the recently designated (2014) Columbine-Hondo (44,372 acres)—protect headwaters within the Sangre de Cristo Mountains. The Rio Pueblo along with other key tributaries like the Rio Lucero and Rio Hondo running through Taos Pueblo flow into the Rio Grande Gorge to the west, now designated as the 235,000-acre Rio Grande del Norte National Monument. Within the monument, Ute Mountain and San Antonio Mountain have strong wilderness characteristics and may eventually be designated.

Of the Taos Pueblo land holdings (99,000 acres), more than one-half (54,000 acres) are Tribally designated wilderness. The second largest land use is allocated to rangeland (16,957 acres), followed by housing and crops (10,938 acres), recreation (6,500 acres), and areas for religious and ceremonial use (6,150 acres). The Pueblo has 242 acres of lakes and 175 miles of streams (Tiller 2005: 65), and the 2010 Census showed a population of 4,384 residents.

The Element of Time: A Brief History of Taos Pueblo and the Blue Lake Wilderness

Near the ancient Pueblo, the Rio Pueblo sourced drinking water for Taos Pueblo from time immemorial. The Pueblo itself, originally comprising 300,000 acres, contains the ancient North House and South House that were constructed in 1000 and 1450 AD, considerably before Spanish contact occurred in 1540 (Tiller 2005). Taos is the best preserved of the northern Pueblos from the pre-Hispanic period that has been continuously occupied to the present day with archeological evidence dating to 900. It received World Heritage Site status in 1992 and is also a National Historic Landmark. The Pueblo maintains a long history of sustainable agriculture and inter-Tribal trade. Apache and Ute camps were interspersed across the lands of the Northern Rio Grande watersheds. In 1689, the Spanish assumed they could claim sovereignty when King Charles I of Spain pronounced New Mexico a Spanish province. He "granted" tracts of land to Indian Tribes; the Pueblo held the 17,350 acres contained in the Pueblo League patent and other smaller tracts it had purchased, while it maintained exclusive use of the Blue Lake area. The transfer of lands from the Spanish to the Mexican governments, and then to the United States in 1848 under the Treaty of Guadalupe Hidalgo, failed to clarify Spanish land tenure systems such as leaving fairly extensive lands near the land grants, especially wildlands, to local and indigenous use. The United States took the position that these were unclaimed. The struggle deepened when Blue Lake plus 48,000 acres surrounding it was incorporated into Carson National Forest in 1906 (Ebright et al. 2014: 294). Stewardship in the early 1900s fit under the progressive concepts of multiple use and highest public good that contrasted sharply with the Pueblo's notion of pristine wilderness connected to deep cultural and religious values (Pinchot 1998) and ideas of privacy for ceremonies. Camping near Blue Lake occurred all summer with the cabin for a Forest Ranger in residence, in full violation of the agreed-upon need for privacy during ceremonies. The annual ceremonial pilgrimage to Blue Lake was unprotected.

In 1921, Commissioner of Indian Affairs Charles Burke began his attack on Indian religions. He intruded on Tribal councils, calling Taos elders "half-human" (Ebright et al. 2014: 295). When they refused to renounce their religion or bar youth from ceremonies, he had them jailed in Santa Fe. The Pueblo Lands Act of 1924 (43 Stat. 636, chapter 331 [USC 331 note]) initiated further actions to remove Pueblo lands. The Pueblo offered to relinquish claims in the town of Taos in return for the Blue Lake watershed and were greatly dissatisfied with State, Federal, and local government actions that followed. Intergovernmental agreements between the Federal Government, Taos, and the State of New Mexico ultimately led only to honoring the Pueblo's willingness to give up rights to the town of Taos and ignored the agreed-upon exchange for Blue Lake. Despite this disappointment, the Pueblo kept negotiating. At last President Coolidge took a positive action and withdrew 300,000 acres from mining in the Carson National Forest. Years of one-sided agreements with the Forest Service ensued, sometimes seemingly cooperative, other times hostile (Ebright et al. 2014). The worst violations of the agreements occurred when tourist permits were issued without Pueblo foreknowledge during times that disrupted religious rites. These setbacks would lead the Pueblo to pursue reclaiming the land and putting it into trust rather than making agreements. The past had forged an iron determination that continued without abatement even through the 1950s when the Federal Government was pursuing a policy of termination of Indian Tribes and their lands.

In 1946, the U.S. Congress created the Indian Claims Commission (ICC). After years of wrangling and delays, the question of Taos control of the Blue Lake watershed finally came before it in 1964. The authority of the ICC was limited to the award of monetary claims, but Taos pressed on for the lands within the Blue Lake watershed. After stunning testimony from Tribal religious leaders and religious officials, followed by anthropologists

and historians supporting their cause and by positive comments from across the political spectrum from U.S. Senators Ted Kennedy to Barry Goldwater, the ICC gave an interlocutory judgment that the Pueblo's claim for Blue Lake was valid. In this case, the Pueblo conceded to submit detailed maps. Meanwhile, Taos Pueblo continued to work to build local support, developed relationships among other kinds of religious and conservation groups, and employed attorneys to keep the pressure up for legislative efforts in Washington, DC. They refused monetary compensation, although a small portion of one determination was paid at one point. Opponents to the return of Blue Lake claimed that it would set a precedent for the loss of public lands, and the Pueblo would not be able to conserve the lands or the watershed. Ironically, it was the Pueblo conservation, framed by Taos religious values, that had kept the lands and water in pristine condition for hundreds of years.

The political battle went on for a few more years before congressional legislation resolved it. Taos became the first Indian Nation to receive lands back rather than money through an ICC determination. Although the ICC did not have authority to return the lands, they could make the recommendation. Finally, although the Taos Pueblo requested the return of 50,000 acres, they agreed to take 48,000 acres into trust if the Federal Government agreed that the remaining 2,000 acres would fall into federal wilderness designation. The 2,000 acres became a critical component of the 5,000 acres needed for the Wheeler Peak Wilderness. President Richard Nixon joined the Blue Lake issue with his proposed Indian Self-Determination and Education Assistance Act (Public Law 93-698) which recognized Tribal sovereignty and the right of Tribes to determine their own future, which was signed into law in 1975. Tribes around the country were watching to see if the new policy was going to benefit them. Like the Taos, they were looking for a statement of good faith for religious and cultural self-determination (Gordon-McCutchan 1991). Taos became the turnkey. The Pueblo's actions created a foundation for future returns to other Indian Nations when the U.S. Congress enacted the Taos Pueblo Wilderness Act (Public Law 91-550) on December 15, 1970. Additional areas were added later to the Pueblo's trust lands, including Bear Lake and 700 acres needed to protect sacred site access, as well as the 764-acre Bottleneck tracts needed for the pilgrimage and access to ceremonies.

The Pueblo's effort to regain the Blue Lake watershed stretched over nearly 65 years. Over this long period, its worst enemies fell away while the Taos built new partnerships. Although they continued to negotiate, the Pueblo never gave up pushing the three-point foundation of its strategy: 1) they had a legal right for time immemorial through consistent use and the highest level of preservation management, 2) they held a claim for religious use, and 3) they maintained the critical functions of the watershed for the continuance of Pueblo life and the well-being of their neighbors.

Values: Cultural Narratives and Wilderness

Blue Lake, Ma-wha-lo in the Tiwa language, sits within the bowl of a primeval forest. Its multiple meanings and functions include forming the spiritual center of Taos Pueblo, providing water for drinking and ceremonial use, and supplying the multiple valued resources that sustain the culture. As a spiritual center, it is regarded as the place of emergence and the center for ceremony and spiritual life. It is regarded as the source of all life for Taos Pueblo and the final resting place for their souls after death: "Blue Lake for our life is living. Blue Lake is where the spirit of Indian God is still living today. We go over there to pray, and we go over there to worship. The stars and the moon and the sun and the sky and the clouds and the air and whatever nature has provided for us, we do believe in this" (Quinino Romero in Keegan 1991: 14).

The watershed holds many shrines that receive active use. Essential values are embedded in the bond between people and the lands through the shrines. They give a place for homage through ceremony and prayers for the gifts of Blue Lake. In return, the Pueblo concept of stewardship requires taking action against any alteration of the land that might threaten the bond. Preservation and restoration are sacred duties for the Taos Pueblo people, and in return they receive the life-giving benefits of the waters, forests, soils, and wildlife. Other essential values include the secrecy of religious knowledge and practices to ensure that Blue Lake continues as the center of spiritual being. The battle for the return of Blue Lake to the Pueblo illustrates the conflict of Taos values with the progressive use policies of government agencies, particularly the emphasis on general public recreation use of the lake. In addition, the turn-of-the-century forestry idea that preserving a pristine old-growth forest was wasteful and should be harvested (Kimmins 2003) was in direct conflict with Pueblo values and traditional knowledge. Leaders tied ceremonial and religious use with provision of clear water for drinking and agriculture as the lake fed the streams below that entered the Pueblo and Spanish settlements. The cacique, the main religious leader, stated "Our Blue Lake wilderness keeps our water holy, and by the water we are baptized. If our land is not returned to us, if it is turned over to the government for its use, then that will be the end of Indian life. Our people will scatter as the people of other nations have scattered. It is our religion that holds us together" (Juan de Jesus Romero in Keegan 1991: 61). The essential nature of cultural and religious values associated with Blue Lake captured in the cacique's statement was clearly illustrated in the historical and policy records from the Blue Lake Wilderness. This thread of interwoven indigenous values shoots through cultural narratives, stories, and expressions of the Taos people. Taos Pueblo is rich in cultural narratives that reflect values for sacred lands and waters.

Wintertime was regarded as the time for telling stories that carried important values through the generations. Some of the stories collected by anthropologist Elsie Clew Parsons, who worked in the region from the 1920s to 1940, included stories of Blue Corn Maiden and Yellow Corn Maiden. For different reasons, the maidens journeyed to the Blue Lake, to the "Big House" where the mothers and fathers were, where they might enter the lake and reappear on the surface as cobs of blue or yellow corn (Parsons 1996). In other narrative journeys, Blue Lake figures as a magical source of corn and fruit even in wintertime. It reveals the sustainable as well as the magical, spiritual nature of this water source. Happiness is often associated with flowing waters. The element of the trickster is present in many Pueblo stories. The Coyote trickster breaks taboos but brings the buffalo to Taos from east on the Plains. These cultural narratives record, transform, and share knowledge and values through intergenerational story telling. The stories illustrate the importance of honoring the land and waters through prayer and ceremony, and keeping the components of the ecosystem inviolate including relationships with animals and Blue Lake itself. Failure to do so results in dire consequences. The narratives illustrate the importance of the law of interdependence to the Taos in governing relations between humans, natural forces, animals, forests, and higher powers (Parsons 1996). Ceremonies and feast days express Tribal values. San Geronimo Feast Day is held in September. Pueblo clowns stand by the Rio Pueblo enforcing a dip in the cold water for some of those passing by. Taos young people tend to gather around waiting for a chance to experience this kind of ritual baptism in the river: "Water is a blessing that is part of creation and part of life itself.… indeed for all living things" (Suazo 2011).

Tribal Wilderness Values Include Protection of Essential Ecosystem Services

The revered beauty and ecological functions of the forested watershed connected it to ancient rights to hunt and fish. The Pueblo held to a religious requirement to "preserve the trees in their primordial state" (Ebright et al. 2014: 312). Most every multiple use activity allowed by the Forest Service after 1906 impacted the Pueblo values and rights. The clearcut timber operations of the time brought erosion and pollution. While foresters thought the forest was full of "overripe timber" (Kimmins 2003), the Taos saw the existence of this forest for time immemorial as an integral part of a functioning ecosystem.

Though the Forest Service later implemented wilderness policy under the Wilderness Act of 1964 (Public Law 88-577), it was still not enough to meet the pristine standard of the Taos. Pueblo values conflicted with western ideas about wilderness in that the exercise of the Taos religion required the protection of the entire watershed system, not just a bounded space. Casual recreational use that might be considered acceptable under wilderness policy was not compatible with Pueblo cultural and religious use. These non-economic values were connected with the ecosystem benefits of clean water for drinking and agriculture, and the ability to hunt, fish, and to gather food, wood, and medicines—activities that made sustainable Pueblo life possible. The Pueblo executed closures on their lands whenever negative alterations to the watershed that might seem minor to outsiders occurred. Full closure occurred when actions like littering and overstocking fish could not be tolerated due to the sacred nature of the area. Honoring sacred land and waters through prayer and ceremony and keeping parts of the land inviolate as sacred areas both overlapped and exceeded wilderness management as implemented by the Federal agencies. Because the wilderness itself held direct connection to subsistence and cultural lifeways maintained through traditional knowledge, it required a unique management regime.

The return of Blue Lake Wilderness secured the flow of clean, clear water for the Rio Pueblo and other streams that supported sustainable agriculture and cultural ways. Wilderness water values connect directly with subsistence, culture, healing, and food sovereignty. In many ways, the idea of ecosystem services comes closest to the indigenous Taos concept of the sacred and connected functions of valuing both non-economic and sustainable ecosystem values. Native cultural understandings do not make the same kinds of distinctions between cultural and natural values as government agencies. Sometimes, economic and non-economic values can be conflated from this perspective, especially with regard to water, but, in fact, the whole interdependent ecosystem holds both kinds of values. The principle of interdependence with the watershed affects the capacity for resilience. After the fight for Blue Lake, the use of the water for traditional agriculture became another component of restoring cultural values. Current Pueblo efforts to return to traditional agriculture are key to preserving the rights to the wilderness waters and culture just as cultural preservation and wilderness water are key to the return of native agriculture. Corn planting at Taos Pueblo represents a cycle of access to water, traditional seeds, and equipment. It implies knowledge of seasonal planting and harvest, technical knowledge of growing corn, and support by mechanical means for plowing due to the rocky nature of the lands (Zink, S, Taos Pueblo, NM, personal communication, September 5, 2017).

From the tribal viewpoint, the sacred values placed upon pristine forests and watersheds do not necessarily conflict or need to be held separate from their ecosystem values. The sacred sites in the wilderness not only provide for religious functions and wild habitat, they are also valued downstream for their contributions to traditional agriculture, grazing, drinking water and other uses with high cultural values. These values interconnect in a web of relationships that reaches from the past to future generations through indigenous knowledge and sustainable actions. Waters fed by wilderness hold increased economic value today, particularly in the arid West. The Taos Pueblo Water Settlement (Abeyta Water Rights Adjudication 2012) added a layer of value to wilderness water.

Current Expressions of Wilderness Values: Taos Pueblo Advocacy for Federal Wilderness Expansion

The most recent expansion of wilderness within the aboriginal sphere of Taos was the designation of the Columbine-Hondo Wilderness on the Carson National Forest in 2014. It encompassed 45,000 acres of wilderness protecting wildlife habitat, water, hunting, and fishing and added 650 acres to the Wheeler Peak Wilderness. Support came from a broad coalition including Taos Pueblo and other northern Pueblos. The Taos War Chief Sam Gomez was among the supporters making statements about the importance of wilderness designation to protect the lands and waters, and the Tribal Council passed a resolution in support (Gomez 2011). The new wilderness designation protected additional water resources including the Rio Hondo and the Red River and placed areas adjacent to Blue Lake in wilderness designation.

Carson National Forest and Santa Fe National Forest began the process of identifying and finalizing a proposal for wilderness study areas as part of their overall land management planning process in 2016. A significant expansion of the Pecos Wilderness high country is under consideration. Taos Pueblo supports the expansion, as does the neighboring Pueblo of Picuris. Governor Pyne of Picuris Pueblo stated key Pueblo values: "This land is precious to the people of Picuris Pueblo. By adding the area to the Pecos Wilderness, it will protect the Pueblo resources, preserve our watershed, our clean water, and our unique landscape and will enhance our economy" (Black 2016).

A broad coalition including Taos and other Pueblos with environmental groups and businesses supported the proposal to establish the initial wilderness study areas that expand existing wilderness areas. The studies may lead to future inclusion in the wilderness system, although some local residents in the Penasco area oppose it. Discussions of special management areas as wilderness buffers and identification of historic uses by Penasco residents are ongoing. The Sipapu Ski Resort opposes the wilderness study areas; the resort is connected to the Snowbowl in northern Arizona's San Francisco Peaks through its major investor where deep conflict with Arizona Tribes continues after increased ski development and the use of recycled sewage water for snow-making (Stumpff 2013). Additional areas are under consideration as wilderness study areas in the Taos area and include further expansions on the Questa Ranger District of the Carson National Forest near the Blue Lake Wilderness, additions to Wheeler Peak Wilderness, and consideration of the Valle Vidal Unit in the Tres Piedras Ranger District in Carson National Forest. In the meantime, the Questa Ranger District of the Carson National Forest assists Taos Pueblo by patrolling the boundary areas during the Pueblo ceremonies at Blue Lake to assure their valued privacy. The dedication of these understaffed wilderness area rangers in high season is surely appreciated by the Pueblo. Backcountry skiing is on the increase on the Questa Ranger District, adding to increasing responsibilities of the limited wilderness staff.

Alternative Tribal Approaches to Protecting Wilderness Values

Tribes with wilderness policy concerns have expanded upon the Taos story in new contexts. Below, two alternative approaches to Tribal wilderness management are described, based upon efforts made by the Sandia Pueblo and the Confederated Salish and Kootenai Tribes to protect wilderness values. A brief consideration is also given to Tribal lands in Alaska.

Sandia Pueblo and the T'uf Shur Bien Preservation Trust

In 2003 court proceedings, Sandia Pueblo set legal precedent by forcing re-interpretation of Spanish grant documents honored through the Treaty of Guadalupe Hidalgo (Ebright et al. 2014), creating the T'uf Shur Bien Preservation Trust inside Sandia Mountain Wilderness. Private inholdings existed within the boundaries, and existing recreational use posed expensive management challenges due to the location near the sprawling urban area of Albuquerque. If these contested lands became Pueblo trust lands, management expenses and levels of political conflict would be high. Sandia Pueblo determined that the best land management strategy was co-management under Federal wilderness designation of the trust area within the Sandia Mountain Wilderness, with the Forest Service retaining primary title and primary funding responsibilities.

The co-management agreement was made, and the contested lands were placed into Federal wilderness designation for the protection in perpetuity of wilderness character. The agreement prohibits gambling, mineral production, timber production, and new uses to which the Pueblo objects. The Pueblo retains free and unrestricted use for cultural and traditional uses. In this arrangement, the Pueblo gave up trust title, but got most of their values protected in the co-management agreement. Sandia Pueblo Governor Stewart Paisano said, "It is the spiritual value of the mountain that was most important: central to our belief, practices and prayers. It is the only source of resources needed for religious ceremonies, shrines and pilgrimages" (Ebright et al. 2014: 146). Sandia co-manages the entire area with the Forest Service with the exception of the 8,800 acres in private property status.

If the Pueblo had fully implemented the court's decision in favor of Sandia's title, it would have meant further struggles and perhaps further court battles with more political fights stemming from the issue of the private property inholdings and heavy recreational use from the adjacent urban areas. Conflicts lead to greater burdens like enforcing regulations and critical media comment for already stretched Tribal administration resources. Sandia Pueblo was able to protect cultural values similar to those of Taos with a different kind of agreement that is becoming more common today. Co-management made resolution swifter, but some things were exchanged in the bargain. Sandia was unable to avoid fish and wildlife regulation as interpreted by the State of New Mexico, and they had to accept the impacts of public use.

Mission Mountains Tribal Wilderness

The Mission Mountains Tribal Wilderness established by the Confederated Salish and Kootenai Tribes in 1982 offers another expression of Tribal wilderness values. In this case, the wilderness area was established on trust lands by Tribal Council resolution (Krahe 1995). The manner of designation was Tribal: full management authority was retained by the Tribe via their Treaty, not the Wilderness Act. The lands bear the patterns of historic Tribal management, so human intervention remains a critical component in their existence. Prescribed burning, gathering, and hunting—supported and carried out through human activity— were infused with value in these Tribal homelands. The management of Tribal wilderness land includes sacred obligations which "may take the form of ritual observance on the land at sacred sites, of continual conduct of the hunt of game species, and the

return to the land or the remains of plant or animal harvest after human use" (McDonald et al. 2000). This wilderness is open to public use, except for areas reserved by the Tribe and subject to closures to meet Tribal objectives. Tribal wilderness is off-limits to any commercial use, but Tribal guides and outfitters may guide hunts and recreational activities in the wilderness buffer zones. This management regime allowing for recreation and public use means Tribal managers must wrestle with visitor desires to ensure Tribal values are protected and communicated. The Tribal wilderness model allows the Tribe to develop regulation appropriate to Tribal values, to control data, and to protect sensitive information and sacred areas. The close connection between Tribal values and Tribal wilderness designation is expressed in the Tribal resolution that established this wilderness: "Wilderness has a paramount role in shaping the character of the people and the culture and people of the Salish and Kootenai Tribes; it is the essence of traditional religion and has served the Indian people of these Tribes..…for thousands of years" (McDonald et al. 2000: 294).

A Comparison of Wilderness Area Regimes and Values

Table 1 expresses different ranges of values connected with each wilderness area regime's particular concept of conforming uses. Thus the Tribal values expressed in the Taos Blue Lake Wilderness are different than the values expressed through the Wilderness Act and have some differences from other Tribes like the Confederated Salish and Kootenai Tribes. Taos stands out as holding the highest values for pristine wilderness, with a Tribal regime that limits use to cultural and religious activities. The Tribal regime is backed by a legal decision: it is only limited by some Federal processes for restricted restoration practices like thinning and prescribed burning. The Sandia case is based on an agreement between the Forest Service and Sandia Pueblo that offers special uses and protections of a Tribal wilderness area within a federally designated wilderness area. In this case, shared management with the Forest Service provides for Sandia review of any new uses. Although Sandia might have pressed for full trust title after a favorable court decision, the practicality of managing the large area with existing heavy recreation use by adjacent urban populations, the problem of private land inholdings, and the high costs of management and enforcement created a context for the negotiated agreement for co-management. The Mission Mountains Tribal Wilderness of the Confederated Salish and Kootenai Tribes is entirely on Tribal trust lands and the Tribe is in full charge of management activities, providing for the greatest flexibility in dealing with responses to threats like climate change. The Tribal wilderness is adjacent to Federal wilderness and allows for recreational uses. The context of adjacency to federally designated wilderness in this case makes recreational use almost a necessity, since enforcing full closure from recreational use would be impractical and extremely difficult. In fact, except for the establishment of cultural areas and the flexibility of Tribal management, recreational regulation is similar to the Federal model, though it can produce some tension with Tribal values. Finally, the full Federal regime for wilderness itself is grounded in the concept of humans as visitors. It allows for wide recreational use, scientific study, and the pristine values as defined by the Wilderness Act. All of the wilderness regimes subscribe to the Federal prohibition on roadbuilding in inventoried roadless areas, although some other Federal and Tribal wilderness areas do have some limited administrative use for subsistence road access under certain legal and discretionary conditions.

Table 1—Contrasts between Tribal and Federal wilderness values and regimes

Management authority (*Wilderness area*)	Values	Value expression	Ecosystem / Economic values
Taos Pueblo (*Trust lands: Watershed and Tribal Blue Lake Wilderness*)	Pristine: sacred Religious: privacy	Full closure. Religious: shrines, pilgrimages, ritual hunting, sacred lake and forests. Restoration.	Watershed, sustainable, cultural practices, trade, water flows. Cultural landscape.
Confederated Salish and Kootenai Tribes (CSKT) (*Mission Mountains Tribal trust lands*)	Preservation: religious and cultural limits. Recreation.	Regulation and closures. CSKT values remain primary for wilderness recreation. Restoration practices. Religious and traditional activities, hunting, gathering, fishing.	Watershed, sustainable, cultural practices, recreation revenues, water uses.
Sandia Pueblo (*T'uf Bien Shur Preservation Trust Area within Sandia Mountain Wilderness*)	Preservation. Religious and Cultural.	Negotiation, agreement and limits approval for new recreation activities based on legal settlement	Sustainable culture through ecosystem services. Sources for cultural materials for arts and ceremonies.
Forest Service (*retains title to both T'uf Bien Shur Preservation Trust Area and Sandia Mountain Wilderness*)	Preservation: wilderness characteristics.	Recognized rights to Pueblo religious uses, gathering ceremonial materials, pilgrimages.	Watershed functions.
Co-management (*Sandia Mountains*)	Balance value conflicts	Regulation, planning to balance wilderness recreation and hunting	Landscape protection. Outfitter and permittee businesses.
Federal wilderness designation (*various Federal lands*)	Preservation values for defined wilderness characteristic: binary distinction of humans and wilderness. Legally determined values for science and recreation.	Wilderness recreation regulation. Various legal and discretionary regulation for cultural / religious values.	Watershed functions, view shed, non-motorized protection / outfitter and permittee businesses. Science.

Table 1 - Contrasts between Tribal and Federal wilderness values and regimes.

Alaska Natives and Wilderness

Alaska Native Tribes have a legal history and environmental context that make them uniquely distinct from Tribes in the contiguous United States. Congress passed the Alaska Native Claims Settlement Act in 1971 (Public Law 92-203) as a move to settle Alaskan land claims, but it left many issues unresolved. Alaska Native corporations were set up to make natural resource and economic decisions (they exist parallel to the Alaska Native governments who retain the right to make other kinds of decisions), but some Alaska Native groups set up local corporations that took different positions from the larger corporations. Later, the U.S. Congress passed the Alaska National Interest Lands Conservation Act of 1980 (Public Law 96-487) to restore Alaska Natives rights to subsistence and settle many other questions. Subsistence rights, Alaska Native corporations, and climate change impacts resulting in moving whole villages and changing hunting and use areas all lead to further complexity. Millions of acres in Alaska are under the management of the Forest Service, the U.S. Department of the Interior (USDOI) National Park Service, and the USDOI Bureau of Land Management, all of whom have different missions and, in some areas, different relationships to applied wilderness policy. Court cases ensued that have helped to outline some of the Tribal-Federal relationships, but applied wilderness policy in specific situations is still evolving in Alaska.

Summary and Conclusions

Indigenous values related to nature and wildlands overlap with those of federally designated wilderness, but differences exist at the foundational level for understanding the human relation to ecological and cultural landscapes. The history of the Taos Pueblo's struggle to establish wilderness management regimes that reflect Tribal values is a story that reveals the depth of those values and Tribal determination to ensure the pristine level of protection for wilderness as defined by the Taos. Though Taos has decided to reject recreational values, except for the viewshed, they now hold significant water rights worth millions of dollars should they decide to lease those rights (Brown 2007). In other Tribes as well, non-economic values may overlap with subsistence and ecosystem service values in relationships that respect interdependence. At the spiritual and cultural level, common themes emerge within Tribal values as ethical imperatives for action. Broad principles of the interdependence of all things material and non-material and Tribally defined values for responsible stewardship and interaction with wildlands and waters form the undercarriage for Tribal wilderness governance. In contrast, Federal agencies began to protect lands under the thesis that they were "pristine" and without human intervention and thus "untrammeled." Today, under the extreme challenges from climate change in the Southwest, including wildfire and reduced water resources, Taos and Sandia may work more closely with managers of Federal wilderness areas and the waters that flow from them (Brown and Froemke 2009).

References

Abeyta Water Rights Adjudication. 2012. Settlement Agreement Among the United States of America, Taos Pueblo, the State of New Mexico, the Taos Valley Acequia Association and its 55 member Acequias, the Town of Taos, El Prado Water and Sanitation District, and the 12 Taos Area Mutual Domestic Water Consumers' Associations. https://taospueblo.com/wp-content/uploads/2015/05/2012_12_12_Abeyta-Settlement-Agreement.pdf [Accessed 2016 July 16]

Armatas, C.; Venn, T.; Watson, A. 2017. Understanding socio-ecological vulnerability with Q-methodology: a case study of water-based ecosystem services in Wyoming, USA. Sustainability Science. 12(1): 105–121. doi:10.1007/s11625-016-0369-1.

Basso, K.H. 2011. Wisdom sits in places: Landscape and language among the Western Apache. University of New Mexico Press, Albuquerque, NM.

Black, L. 2016. Plan to expand Pecos Wilderness faces resistance. Albuquerque Journal. January 10. http://www.abqjournal.com/702630/plan-to-expand-pecos-wilderness-faces-resistence.pdf. [Accessed 2017 October 16].

Brown, F.L. 2007. Market prices as measures of water scarcity in New Mexico and the West. In: Proceedings of 52nd Annual New Mexico Water Conference. Beyond the year of water: Living within our water limitations. Santa Fe, NM: New Mexico Water Resources Research Institute: 49–53.

Brown, T.G.; Froemke, P. 2009. Effect of estimated mean annual contribution to water supply from units of the National Forest System of the U.S. Forest Service. Unpublished report on file with: U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

Cajete, G. 2000. Native science: Natural laws of interdependence. Santa Fe, NM: Clearlight Publishers.

Ebright, M.; Hendricks, R.; Hughes, R.W. 2014. Four square leagues: Pueblo Indian land in New Mexico. Albuquerque, NM: University of New Mexico Press. 452 p.

Gordon-McCutchan, R.C. 1991. The Taos Indians and the battle for Blue Lake. Santa Fe, NM: Red Crane Books. 236 p.

Gomez, S. 2011. Page last modified: 2011 October 25. Statements to Senator Udall, Senator Heinrich, and Congressman Ben Lujan. http://www.nmwild/images/our-work/columbia-hondo-wilderness/Final/statements-doc. [Accessed 2016 December 22].

Keegan, M. 1991. The Taos Pueblo and its sacred Blue Lake. Santa Fe, NM: Clear Light Publishers. 63 p.

Kimmins, J.P. 2003. Old-growth forest: an ancient and stable sylvan equilibrium, or a relatively transitory ecosystem condition that offers people a visual and emotional feast? Answer—it depends. The Forestry Chronicle. 79(3): 429–440. https://doi.org/10.5558/tfc79429-3.

Krahe, D.L. 1995. A confluence of sovereignty and conformity: The Mission Mountains Tribal Wilderness. Missoula, MT: University of Montana. M.S. thesis. https://scholarworks.umt.edu. [Accessed 2017 November 17]

McDonald, D.; McDonald, T.; McAvoy, L. 2000. Tribal wilderness research needs and issues in the United States and Canada. In: McCool, S.F.; Cole, D.N.; Borrie, W.T.; O'Loughlin, J., comps. 2000. Wilderness science in a time of change conference; Volume 2: Wilderness within the context of larger systems; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-2. Ogden, UT: U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station: 290–294.

Pinchot, G. 1998. Breaking new ground. Washington, DC: Island Press. 542 p.

Parsons, E.C. 1996. Taos tales. New York: Dover Publications, Inc. 181 p.

Stumpff, L. 2013. Living waters: Linking cultural knowledge, ecosystem services, and wilderness. International Journal of Wilderness. 19(1): 20–25.

Suazo, G. 2011. A Tribal perspective about settlement of the Taos Pueblo water rights. https://www.narf.org/nill/documents/water/2011/gilbert_suazo-abstract_of_water_symposium_presentation.pdf. [Accessed 2018 January 12].

Tiller, V.E. 2005. Tiller's guide to Indian Country: Economic profiles of American Indian reservations. Albuquerque, NM: Bow Arrow Publishing Co. 1120 p.

Watson, A.; Alessa, L.; Glaspel, B. 2003. The relationship between traditional ecological knowledge, evolving cultures, and wilderness programs in the circumpolar north. Conservation Ecology. 8(1): 2. doi:10.5751/ES-00589-080102.

Watson, A.E.; Carver, S.; Armatas, C. [et al.]. 2014. Traditional phenological knowledge: literature review and case study descriptions of cultural resilience in fire adapted ecosystems by Tribal college faculty in the southern Rockies. Final report: JFSP project number 12-2-01-18. Joint Fire Science Program, Missoula, MT.

Watson, A.; Stumpff, L.M.; Meidinger, J. 2012. Traditional wisdom and climate change: contributions of wilderness stories to adaptation and survival. International Journal of Wilderness. 18(2): 21–25.

Yin, R. 2013. Case study research: design and methods. 5th ed. Thousand Oaks, CA: SAGE Publishing.

Nature and Wilderness in Wartime:
A Window into Our Contemporary Environmental Nihilism

BY KATHERINE C. SNOW

We can begin by observing that speaking strictly physically, wild nature and the non-human world writ large are central to human wars and violent conflicts in a number of ways.

For example, non-human nature has always served, and still today serves, as the ultimate source of all the "raw materials" that power human conflicts: from the legendary cedars of Lebanon used to build naval fleets in the Phoenician era (McNeill 2004) to the steel-, petroleum-, and silicon-powered militaries of today. The ultimate post-WW2 weapon is made with uranium, found in nature; many other weapons of mass destruction, including many biological weapons, also entail human modification of certain potentially lethal building blocks sourced from the natural world.

Wild nature can also frequently serve as a spur to violence and conflict among nations or peoples. This can take many forms. Groups may carry out militarized hostile extraction of wild plants and animals, water, oil, precious stones, or minerals from the territories of other groups. At larger scales, the desire for access to new landscapes and their wild "resources" can form one motivation for colonial or other forms of outright national-scale invasions and land seizures, sometimes leading to the permanent redrawing of political boundaries.

Further, the natural world serves as the final receptacle, the ultimate sphere or theater of human conflicts and wars. Strategy in wartime does not neglect this fact, either, and military ways of thinking and planning, which have grown out of conflicts seem to possess a certain clarity—clarity all too rare in most other mainstream policy thinking—regarding things like the enormous power of natural processes such as weather, the difficulty of supplying troops with food, water, and shelter in unforgiving landscapes, and even macro-scale questions of the Earth's fragility and limits and its inevitable feedback responses to human activities. The only scientific climate model world leaders seem to have taken seriously to date is the one which shows what nuclear weapons could do to the entire atmosphere and biosphere, if fired in large numbers in an all-out nuclear war.

Beyond such basic physical ways that wild nature figures centrally in human conflicts and partly informs military and strategic thinking, there are also several important non-physical, ethical aspects of the interplay between wild places and human conflicts that are worth highlighting if we are to use the question of war to potentially expand our understanding of the importance of wilderness preservation for the 21st century.

Historically, wars and conflicts have often raised societies' moral antennae, particularly in their aftermath, and thus our post-Industrial Revolution relationship with wild nature might also reveal itself differently and perhaps more clearly to our moral faculties in this context. War entails revamping what is, and what is not, morally permissible. For fighters, the regular peacetime rule of law is largely suspended while a military system of order and rule-making takes its place for as long as the campaign lasts. Despite efforts to make war humane or only per-

Katherine Snow *is a research associate at Princeton University and Max Planck Institute for Geoarcheology in two main areas: philosophy of nature and environment-security linkages.*

secute just wars, what happens in real wars and conflicts, including the large-scale directed killing of other human beings, seems to pose a moral danger for societies, and social reasoning and reaction, which occurs during and especially after large-scale wars and conflicts, often reflects this. We see war as an actual tragedy, one we would like to learn how to avoid, even permanently, as some utopian next phase of human advancement, even as we understand that it will likely continue in the immediate term. Often, wars and conflicts do not simply come and go quietly, but jolt the collective psyche. Political movements are rejected or accepted; rulers or borders are changed; alliances begin or end; shifts in popular sentiment, at a local or a national or even a global scale, take place.

The same non-customary ethical attention is also already, to some extent, applied to actual or threatened degradation or destruction of nature and other species during conflicts; this nascent opening onto reconsidering the ethics of any degradation or removal of wild-ness from the world as a result of war could quite straightforwardly be expanded upon in future environmental, and political, thought and action. As noted above, unlike their emissions policy-focused cousins, climate models of "nuclear winter" scenarios are actually, thus far, heeded (Robock et al. 2007), and this is despite long-lingering disagreements over precisely *how* physically bad, or how physically survivable, nuclear winter would be (Robock et al. 2007; Rueter and Kalil 1991). This seems to indicate that at least some element of policymakers' heeding of these models derives from a moral judgment on the undesirability of rendering the global environment into anything close to a nuclear winter state, and that they do not seek to avoid nuclear exchanges solely on the basis of some binary assessment of such an exchange's complete non-survivability. In the context of contemplating nuclear winter, leaders indicate that they can as a last resort "return home" in their thinking about geopolitics; at least in this extreme case, they can internalize, and plan strategic action (and inaction) in line with, our utter reliance on the right amount of sunlight reaching Earth, on upholding the carbon cycle, and on the non-contamination of the Earth's soil. Though this clarity may be oddly elusive in other contexts, they thus demonstrate some form of recognition that there is a point at which the natural world as our physical theater of war limits morally permissible options available to the warfighter, just as it does the physically possible ones.

At scales smaller than this well-known global example's, we can also often find recent evidence of societies registering it as a moral offense when the natural world and its non-human species are caught up in wars (Silverstein 2023), perhaps reacting to the injustice of involving nature in a conflict that cannot logically concern the non-human world. In some post-conflict societies, a connection exists for people between the morally preferential state of social peace (which they have just regained) and the return of animal and plant life to pre-war or extra-war levels (Swarns 2000). Anecdotally, seeing animals and plants and landscapes destroyed in conflicts appears to sometimes trigger moral responses akin to those occasioned by witnessing innocent civilians, particularly children, caught in the crossfire, and there is no reason this cannot be further expanded upon to develop a deeper understanding of our interconnection with all life and the right of wild spaces and species to exist free from violence and harm brought to them by human activities (especially those undertaken for debatably valid and highly subjective political reasons, as most wars are). Moreover, just as witnessing the suffering of innocent humans in war may nudge societies toward finding conflict itself undesirable, irrational, or immoral, so too may seeing landscapes or non-human species degraded or destroyed as a result of violent human conflicts for which they bear no responsibility. Some legal scholars are now calling for greater protection of living plants and animals in wartime in international humanitarian law (de Hemptinne et al. 2022).

However while these and other general intuitions do already point toward various facets of how war might change our perception of our right to destroy the non-human world, the specific ways in which wilderness

and its preservation figure in this context require us to go further in understanding our willingness to destroy nature and wild species in both war and peace. Wilderness arguably has a vital role in establishing the ground for a peaceful, non-war-torn global society or at least its possibility, but we must first acknowledge that another part of what the suffering and damage to nature in wartime shows us is that there is too little *difference* between how we treat it in wartime and how we treat it in our (socially defined) peacetimes. As it stands now, nature and wild places in human-defined "peacetime" suffer anthropogenic impacts that differ only in kinetic force and tempo from the general violent treatment of nature exhibited in conjunction with our wars and conflicts. Severe anthropogenic environmental degradation, contamination, and vanishing (SEDCOV) (Snow 2024) characterizes most 21st century "peacetime", legal, approaches to nature in the world today (with the exception of some adequately protected wild[er] areas and some Indigenous- or community-held lands). Humans as willful practitioners of SEDCOV routinely carry out what is effectively a ceaseless and warlike assault upon the natural world using instruments and technologies of extreme violence which cause lasting damage. The bulldozer is akin to the tank on several valences. Peacetime does not end our elevation of sheerly human objectives over every and any consideration or valuing of nature for its own sake, or our rendering of nature everywhere and always only a means for us to use to meet our ends (cf. Crist 2014; Sideris 2017). In the 21st century, nature's war–peace continuum has almost null length. As human beings we must morally recoil at such a truncation itself as ethically undesirable, because nondiscrimination between war and peace is a form of nihilism.

What I would define as environmental nihilism—assigning the non-human world in and of itself absolutely no value—is a deep-set and complex problem in the contemporary West (Snow 2026). In this particular example of wild places and species suffering equally in wartime and peacetime, overriding the moral recoil this sameness ought to bring is all too easy in the milieu of broader environmental nihilism which defines the contemporary West. Humans may believe they can confine such nihilism to their views of nature, while upholding non-nihilistic ideals vis-à-vis other humans. But just as it is impossible to physically wall ourselves off from feeling the impacts of the damages we are wreaking on the natural world, nihilism toward nature, once introduced anywhere in our ethical belief system, inevitably threatens the entire constellation of all our moral attitudes.

Such considerations of nature's unethically truncated continuum between war and peace (and what it signifies) bring us, finally, to how a consideration of the travesty of the destruction of the natural world in wartime can help generate a fresh understanding of wilderness, the subject of this Congress. Wilderness becomes nothing less than an affirmation against environmental nihilism, and an insistence that there must be a distinction somewhere on earth we make for nature between war and peace.

The effort to preserve and expand wild areas reveals itself as a refusal to accept that nature should in no place on this planet actually experience meaningful peace at the hands of *Anthropos*—a peace healthily different from how nature is treated in the constant peace–war to which we currently ceaselessly subject it. Arguing for the protection of wild spaces becomes an effort to re-lengthen the continuum, the distance and distinction, between war and peace, for nature and by extension for ourselves. Human societies, too, are increasingly facing our own shortened continuum between war and peace. Late modernity itself is characterized in some ways by the collapse of the distinction between the two, even when this collapse is sometimes not blatantly obvious. We see this troubling truncation in both main functions of the modern nation-state—the security function and the economic one. Clausewitz pointed out the continuity between war and non-war for political powers two centuries ago, and contemporary leaders retain his view that war remains always on their final menu of options, continually interweaving diplomacy and threat, even in a nuclear-armed world (Clausewitz 1976 [1832]). In the case of the econo-

my, as Huxley satirized in *Brave New World*, the 20th century wartime economic model of constant high levels of consumption (just like the colonial wartime economies based upon constant expansion in the centuries before) has helped shape the template for our peacetime one (Huxley 1998 [1932]). Robertson et al. (2020) in *Nature at War* also discuss how in the 20th century's so-called Great Acceleration, the Western "economy" was transformed to maintain a permanent wartime tempo via focusing on constant, rapid consumption. I place economy in quotation marks in the foregoing sentence because of course this is a euphemism, even an unwitting misdirect, for where the transformation actually physically took place: what was violently transformed in this shift was the Earth and its atmosphere, the entire non-human world.

While human societies have in large part accepted (and even adopted with enthusiasm) our contemporary destructive conflations of war and peace as a means of achieving economic prosperity, some philosophical, legal, and moral schools of thought do try to push back against these conflations, insofar as the human social realm is concerned. Critiques of modernity and its dehumanizing dangers fill the shelves. Yet very little effort has been expended thus far on pushing back against (or even recognizing) our acute environmental nihilism, not least because the Great Acceleration version of an economy *needs* the assumption to remain in place that the non-human world has no moral significance and thus the wartime–peacetime distinction *does not need* to be upheld for it.

The rising tide of such environmental nihilism in contemporary society has as its logical terminus the deliberate vanishing or conversion by humans of non-human, non-domesticated, nature in its entirety via maximally efficient processes (cf. also Crist, 2014). But the maximal conversion of all wild nature to human ends is neither physically survivable nor morally desirable. This means that opposing environmental nihilism by defending the existence and expansion of wilderness constitutes an effort to reinstate the possibility of peace, not only for nature, but also as a feature of our shared social future.

Wilderness opposes late modernity's conflations and confused inversions of war and peace simply by being territory where humans and the natural world can both, and jointly, experience actual peace—peace which is qualitatively and morally a different condition from the ongoing warlike treatment of nature existing almost everywhere else.

Wilderness zones constitute a stand against society's deep absorption of the environmental nihilism which ignores the moral reckoning any collapse or inversion between war and peace must occasion within us if we are to remain human. Without wilderness, the moral continuum between war and peace for nature collapses altogether and, by human time scales, potentially permanently. We lose nature's actual peace, the only honest yardstick against which we must measure the violence of our war against it everywhere else, everywhere outside our wilderness zones. We thus also lose the anchor of our moral reasoning about "how much" destruction of nature is permissible and for "how long"; we give up any thought of nature's true survival, and effectively crown ourselves at last as gods able to survive without it. If environmental nihilism is allowed to fully complete its permeation of 21st century ethics and standards for action, newly unbounded wars on both humanity and nature may logically be anticipated as the result. In the West's recent slavish rush to embrace environmentally and socially ruinous junk tech, and leaders' ongoing neglect of the hard work of nuclear disarmament, their rumblings can already be heard. It is time for human societies to return "home" to think toward building a non-war-torn world from the perspective of needing an intact Earth, where the standard of true intactness is to be found in the absence of human-caused war found in wilderness.

References

Clausewitz, C. 1976 [1832]. On war. Howard, M.; Paret, P., eds. and trans. Princeton University Press.

Crist, E. 2014. Ptolemaic environmentalism. In: Wuerthner, G.; Crist, E.; Butler, T. eds. Keeping the wild: Against the domestication of Earth. Island Press: 16–30.

de Hemptinne, J.; Peters, A.; Kolb, R. 2022. Key findings and recommendations. In: Peters, A.; de Hemptinne, J.; Kolb, R. eds. Animals in the international law of armed conflict. Cambridge: Cambridge University Press: 385–404.

Huxley, A. 1998 [1932]. Brave new world. 1st Perennial Classics ed. New York: Harper Perennial.

McNeill, J.R. 2004. Woods and warfare in world history. Environmental History 9(3): 388–410.

Reardon, Sara. 2018. FARC and the forest: Peace is destroying Colombia's jungle—and opening it to science. Nature. 558(7709), 169.

Robertson, T.; Tucker, R.P.; Breyfogle, N.B.; [et al.]. 2020. Nature at war: American environments and World War II. Cambridge: Cambridge University Press.

Robock A.; Oman L.; Stenchikov. G.L. 2007. Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences. Journal of Geophysical Research: Atmospheres. 112(D13). doi:10.1029/2006JD008235.

Rueter, T.; Kalil, T. 1991. Nuclear strategy and nuclear winter. Review of Fisher, D.E. 1990. Fire and ice: the greenhouse effect, ozone depletion and nuclear winter. Grinspoon, L., ed. 1986. The long darkness: psychological and moral perspectives on nuclear winter. Lynch, A. 1987. Political and military implications of the "nuclear winter" theory. Sagan, C.; Turco, R. 1990. A path where no man thought: nuclear winter and the end of the arms race. Sederberg, P.C. 1986. Nuclear winter, deterrence, and the prevention of nuclear war. World Politics. 43(4): 587–607. doi:10.2307/2010538

Sideris, L.H. 2017. Consecrating science: Wonder, knowledge, and the natural world. Oakland, California: University of California Press.

Silverstein, K. Page last modified: 2023 June 8. President Zelensky: The destruction of hydroelectric dam is "ecocide". Forbes Magazine. https://www.forbes.com/sites/kensilverstein/2023/06/08/president-zelensky-the-destruction-of-hydroelectric-dam-is-ecocide/

Snow, K. C. 2026. Our inevitable third Spinoza Controversy: Ontologies of necessity and environmental nihilism. New York: Palgrave Macmillan.

Snow, K.C. 2024. Responding to the West's environmental security paradox: Organic national security and the contemporary state embrace of severe anthropogenic environmental degradation, contamination, and vanishing (SEDCOV). Global Security: Health, Science and Policy. 9(1). doi:10.1080/23779497.2024.2358754

Swarns, Rachel. 2000. For war-weary Angola, animals offer a peaceable kingdom. The New York Times. 27 September; Page 7, Column 1.

Lesson from the Indian Tiger and the American Buffalo:
Return to the roots

BY OISHIMAYA SEN NAG

The Indian tiger and the American bison/buffalo: what do they have in common?

Continents apart—the apex predator of the Indian jungle and the ruler of the vast American grasslands have been central to the cultures of the Native inhabitants of their respective regions for millennia. Yet, the arrival of the Europeans and their colonization of India and North America dismantled these animals from their positions of reverence. The new rulers of the land now started slaughtering them en masse with the ultimate aim of exterminating them. The ill-treatment delivered to these animals was only part of a larger conspiracy to launch a cultural genocide to dominate and rule over the Native inhabitants (Phippen 2016; Sullivan and Hickel 2022). Yet, these animals and their people never gave up fighting against the atrocities meted out to them over the centuries of foreign rule, and today, the bouncing back of numbers of both the tiger and the buffalo is a reason to celebrate (Biswas 2025; Henry 2023). The tiger now enjoys the title of India's national animal, while the American buffalo is celebrated as the national mammal of the United States.

At the 12th World Wilderness Congress (WILD12) it became quite clear why it is essential to recognize and appreciate the wisdom of Indigenous peoples and other local communities in conservation. Modern science and technology, tracing its roots to the Scientific and Industrial Revolution in Europe, cannot be the only answer to the large-scale environmental degradation and biodiversity loss the world faces today. In fact, it is one of the primary reasons global ecological health is at the precipice in the 21st century (Gupta 2024). Traditional cultures and practices have conserved the tiger in India and the American buffalo in the United States for thousands of years, and it is time to harness the same modalities in modern conservation practices. Both Indian tigers and American buffalos and many other species of wildlife, revived in the protection of inviolate areas, now need the acceptance and support of local communities more than ever before to establish themselves once more in the lands from which they were wiped out.

The Dark Ages for Wilderness

In India, tigers were turned into trophies and indiscriminately killed during colonial British rule (Govindarajulu et al. 2024). Prior to this time, these predators held a special position in the region; along with lions, they ruled the vast, undisturbed, biodiversity-rich wildernesses of India, just like Indian maharajahs ruled over the cities, towns, and villages of the highly prosperous and advanced pre-colonial India (Sen Nag 2020). Similar to the American buffalo, which was an integral part of Native American cultures and symbolized life and survival (Pomeranzeva 2024), the tiger featured heavily in Indian mythology, folklore, and cultural practices and aroused fear, awe, and reverence among people (Sen Nag 2020).

Oishimaya Sen Nag *is a conservation storyteller and senior editor of the WorldAtlas.com.*

However, the fate of the Indian tiger changed when the British came to power in the country. Over thousands of years, the natural resource-rich country of India had attracted many invading powers from far and wide, but none were as destructive as the British invaders from Europe (Shaikh 2025).

Like the indiscriminate hunting of the buffalo and the extermination of Native Americans in the New World by the European settlers, the Indian tiger and the Indian people came under an era of identity loss like never before under the new European regime. In North America, the new settlers aimed to exterminate the buffalo for economic gain and to deprive the Indigenous inhabitants of their basic survival needs, as the Indigenous depended on the buffalo for food, shelter, clothing, and more (Clark 2023). In India, the strategy of the colonial power was to clear the forests of predators to ease the exploitation of India's vast natural resource reserves and expand their rule across the land (Elgood 2020).

So, while buffalo skulls piled up in the grasslands of North America, in India, tigers were reduced to trophies, floor mats, and fashion wear in the homes of the British and some Indian rulers, who aimed to please the new ruling class (Govindarajulu et al. 2024).

The British set bounties on hunting India's wildlife, with a plan to deprive the land of its major predators like tigers, lions, leopards, and cheetahs. In some places, the administration announced higher rewards for hunting female tigers and their cubs. White hunters now acted like messiahs, hunting down "man-eating" tigers and leopards to protect the "helpless and hapless natives" in India's villages. Ironically, however, they did so after depriving the people of their right to self-defense from such predators by passing legislation restricting hunting and the right to own weapons (Sen Nag 2020).

According to Mahesh Rangarajan, a renowned Indian environmental historian, more than 80,000 tigers were slain in India between 1875 and 1925 (Guynup 2017)!

With the predators disappearing and the local people hindered, the colonizers started exploiting India's forests to the maximum amount possible. Vast tracts of forests were now available for commercial exploitation. Virgin forests were cleared to be replaced by enormous plantations run by cheap labor from the local workforce. This set-up was very profitable for the colonizers, who exploited both wildlife and people to extract maximum profits from the resource-rich country of India (Singh 2022). Something similar was going on in North America, where buffaloes were eliminated, and Indigenous people were banished to reservations to open up land to build a profitable empire.

Bouncing Back in Untouched Spaces

The exploitation of the Native population and their buffaloes continued even after the birth of the United States. Buffalo number became so insignificant that the government finally had to intervene to prevent the species' extinction in the late 1800s. From an estimated 40 to 60 million in North America before the arrival of European settlers, only 541 of these animals still survived in 1889 (Gili 2019)! The American Bison Society was established in 1905 to restore buffalo numbers in the country (Whitaker-Guest 2024). A series of new legislations and the creation of reserves to protect the species followed to restore buffalo populations under the leadership of President Theodore Roosevelt (McKee 2022).

In India, things took a worse turn for the tigers after 1947, when British rule ended and India gained independence. Hunting of wildlife, formerly reserved primarily for the ruling class and their benefactors, became accessible to anyone who could pick up a gun and shoot in the absence of any stringent regulation. The colonizers had already "commodified" the tiger during their lengthy rule, and tiger body parts were now traded on a global scale like never before (Govindarajulu et al. 2024; Sen Nag 2020).

In 1966, Indira Gandhi's appointment as Prime Minister of India brought a new wave of change. Gandhi was environmentally aware and concerned about the wanton loss of wildlife in India due to hunting. A group of like-minded influential individuals and organizations also expressed concern about the near extinction of many species in India. All this attention on India's disappearing tigers and other wildlife gave birth to the Wildlife Protection Act 1972 and Project Tiger 1973. The former protected India's wildlife from hunting and other forms of exploitation, while the latter focused on reviving tiger populations in protected areas called tiger reserves spread across the country (Sen Nag 2020). The first-ever tiger census conducted in India in 1972 revealed the tiger population to be only 1,827, a precipitous drop from the thousands that once roared across India's wilds. There was a sense of urgency, and the relocation of villages from tiger reserves started at a rapid pace to create inviolate spaces for tigers to breed undisturbed (Cotta 2022).

The Project Tiger of India went on to become one of the world's most successful species conservation projects and helped revive tiger populations in the country by providing these predators untouched spaces to breed. Barring initial hiccups, since 2010, the tiger population has steadily increased in India, with the latest census recording 3,682 tigers in the country (Biswas 2025).

In America, too, American buffalo population recovery was launched in federal protected areas like Yellowstone National Park that helped recover wild buffalo numbers in the country.

Traditional Wisdom for Community-Led Conservation

Today, it is time once again to foster community-led conservation, as the protected areas managed by the governments have limited expansion potential.

In the United States, the Native Nations are already playing a major role in buffalo revival. Their reverence for the buffalo and traditional wisdom allows the animals to roam wild and free in Native lands. A large number of these animals have thus been transferred from federally protected areas to tribal lands where they are accepted.

According to WWF, the American buffalo population has risen to around 45,000 in conservation herds. Government agencies, non-governmental organizations, and Indigenous communities manage these herds. Nearly 25,000 of these buffaloes are protected by the Native Nations (Henry 2023). Outside tribal lands and protected areas, however, free-ranging buffaloes are often not welcome and come into conflict with non-Native populations, especially ranchers who consider the wild buffalo as a threat to their livelihood.

In India, tigers are also spilling out of protected areas into multi-use landscapes with high human presence and activity. India's 58 tiger reserves encompass only around 2.3 % of the country's total land area. It is estimated that around 30% of tigers are found outside protected areas in India (Ghai 2023).

Living with tigers, however, is not the same as living with the American buffalo. Tigers are large carnivores with the potential to prey on livestock and humans.

Yet, like in Native American cultures, where reverence for the buffalo allows people to co-exist with these grassland giants in tribal lands, India's culture of conservation plays a significant role in fostering the people's acceptance of tigers in and around their settlements.

The Indian cultural belief of *Vasudhaiva Kutumbakam*, meaning "all world is one family", preaches that every life form is linked to each other as part of the same family. The fact that the "culture of conservation" works is evident from numerous examples across India.

Take, for example, the Warli, which is an Indigenous tribe of India. This community worships the wild big cat as *Waghoba*, which can be a tiger, leopard, or lion. The Warlis offer prayers and sacrifices to please the Waghoba and pray to him to protect the forest and their livestock. According to researchers, the institution of the Waghoba is an ancient strategy to foster human–big cat co-existence in a landscape. This belief allows the mega carnivores to co-exist with the people (Nair et al. 2021).

Similarly, the local communities in the Sundarbans region of India worship *Bonobibi* (forest Goddess) and *Dakhin Rai* (tiger god) to protect themselves from tiger attacks since tigers are known to attack and prey on humans in the region. Even more interestingly, tigers in the Sundarbans unite people of different faiths, as Hindus and Muslims worship the same deities to protect them from the tiger's wrath (Sarkar 2019). Such cultural beliefs elevate the position of wildlife to the level of revered and feared deities and protect them and the ecosystem from destruction by people (Yarlagadda 2022).

Thus, cultural beliefs and traditional wisdom of the Native Peoples in both the United States and India play a major role in allowing wildlife to thrive outside government-protected areas. It is why, despite housing 18% of the global population in around 2.4% of the planet's land area (Pande 2019), India is still home to the world's largest population of wild tigers, Asian elephants, one-horned rhinos, Asiatic lions, and other wildlife. Similarly, in the United States, the vast majority of the wild buffalo population outside federally protected areas is found in Native reservations, which together occupy less than 3% of the country's land (Kraker and Beckstrom 2021).

However, in an era of globalization and the dominance of developed Western economies, the infiltration of Western culture and lifestyle threatens the cultural integrity of younger generations of Indians. The Western culture revolves around human centrality that encourages consumerism and the exploitation of natural resources and wildlife for economic gains (Zak 2020). It takes the focus away from traditional values that preach co-existence with nature. This change is clearly visible in urban India dominated by Western culture and lifestyle practices (Shukla 2024) where the tolerance for animals sharing spaces with humans is significantly lower than in rural India where traditional beliefs are more prevalent. On the other side of the globe, Native American cultures continue to combat the threat of cultural dilution and loss of connection of their youth with their roots (Fatherree 2022). Such a loss of traditional cultures and wisdom could translate to a darker future for wildlife.

Therefore, it is time to go back to the roots and revive and strengthen the bond between wildlife and their people. It can only come when the culture of conservation and traditional wisdom of Native and Indigenous communities are integrated and aligned with conservation strategy designs that are currently driven mainly by methods based on science, technology, and modern education rooted in the Western concept of conservation (Zimmerman 2022).

At WILD12, there was a strong focus on promoting environmental stewardship and governance by local and Indigenous communities to achieve successful conservation. It was heartening to see the Native American community hosting the Congress and uniting to protect the wild American buffalo and its habitat. Globally, emphasis is now being given to community-led conservation.

It is now important for the world to motivate and include the Indigenous and other local communities to spearhead conservation initiatives. For this, the world needs to respect the cultures, traditions, and knowledge of these communities that have helped protect wild spaces for thousands of years. Conservation strategies must be designed using modern science as well as traditional knowledge. Also, conservation will only work when the public have a pro-conservation attitude, which is possible when the ancestral bond between humans and the rest of nature is revived and an emotional connection between the two is established. The Indian tiger and the American buffalo both need the support of the majority of the population of their countries to survive a future that is riddled with many challenges. Promoting the "culture of conservation" of the Native communities can be one of the best ways to do so.

References

Biswas, S. Page last modified: 2025 January 1. "Key lessons" for conservation as India's tiger population doubles in a decade. BBC. https://www.bbc.com/news/articles/cly9d4n1rgmo

Clark, C. Page last modified: 2023 August 23. Buffalo slaughter left lasting impact on Indigenous peoples. Emory News Center. https://news.emory.edu/stories/2023/08/esc_bison_impact_24-08-2023/story.html

Cotta, F. 2022. Project Tiger turns 49. Sanctuary Club. 42(1). https://sanctuarynaturefoundation.org/article/project-tiger-turns-49

Elgood, R. Page last modified: 2020 November 24. How East India Company introduced rewards for killing India's "dangerous vermin" tigers. The Print. https://theprint.in/pageturner/excerpt/how-east-india-company-introduced-rewards-for-killing-indias-dangerous-vermin-tigers/550291/

Fatherree, D. Page last modified: 2022 November 25. Heritage under fire: Native Americans fight for culture, history, survival. Southern Poverty Law Center. https://www.splcenter.org/resources/stories/heritage-under-fire-native-americans-fight-culture-history-survival/

Ghai, R. Page last modified: 2023 July 12. International Tiger Day 2023: Should India cap its big cat population? Here is what experts say. DownToEarth. https://www.downtoearth.org.in/wildlife-biodiversity/international-tiger-day-2023-should-india-cap-its-big-cat-population-here-is-what-experts-say-90573#google_vignette

Gili, E. Page last modified: 2019 August 1. Return of the American buffalo. Deutsche Welle. https://www.dw.com/en/americas-plains-indians-bring-back-bison-to-their-lands/a-46984048

Govindarajulu, D.; Gupta, D.; Shahabuddin, G. Page last modified: 2024 September 28. Colonialism turned tigers to trophies. How India relocated humans to save them. NDTV World. https://www.ndtv.com/world-news/colonialism-turned-tigers-to-trophies-how-india-relocated-thousands-of-humans-to-save-them-6670491

Gupta, A. Page last modified: 2024 December 12. The dark side of Industrial Revolution: environmental destruction. Massive Earth Foundation. https://massivefoundation.org/opinion/dark-side-of-industrial-revolution/

Guynup, S. Page last modified: 2017 January 10. As Asian luxury market grows, a surge in tiger killings in India. Yale Environment 360. https://e360.yale.edu/features/as_chinese_luxury_market_grows_upsurge_in_tiger_poaching_india

Henry, A. Page last modified: 2023 October 2. Native Nations lead the way to returning bison to their traditional homelands. https://www.worldwildlife.org/stories/native-nations-lead-the-way-to-returning-bison-to-their-traditional-homelands

Kraker, D.; Beckstrom, M. Page last modified: 2021 August 10. Returning land to Native Americans. MPR News. https://www.mprnews.org/episode/2021/08/09/returning-land-to-native-americans

McKee, A. 2022. Bison conservation. Theodore Roosevelt Center. https://www.theodorerooseveltcenter.org/Learn-About-TR/TR-Encyclopedia/Conservation/Bison%20Conservation

Nair, R.; Patil, O.; Surve, N. [et al.]. 2021. Sharing spaces and entanglements with big cats: the Warli and their Waghoba in Maharashtra, India. Frontiers in Conservation Science. 2, 683356. doi:10.3389/fcosc.2021.683356

Pande, H. Page last modified: 2019 June 19. India has just 2.4% of world's land but 18% of its population. The Times of India. https://timesofindia.indiatimes.com/city/nagpur/india-has-just-2-4-of-worlds-land-but-18-of-its-population/articleshow/69848388.cms

Phippen, J.W. Page last modified: 2016 May 13. "Kill every buffalo you can! Every buffalo dead is an Indian gone." The Atlantic. https://www.theatlantic.com/national/archive/2016/05/the-buffalo-killers/482349/

Pomeranzeva, H. Page last modified: 2024 July 17. Reviving the sacred bond: Native tribes and the cultural legacy of the American bison. Smithsonian Folklive Festival. https://festival.si.edu/blog/buffalo-native-culture

Sarkar, S. Page last modified: 2019 November 23. Keeping faith with Bonbibi. Mint. https://www.livemint.com/mint-lounge/ideas/keeping-faith-with-bonbibi-111641418675231.html

Sen Nag, O. Page last modified: 2020 April 25. Spotlight on the Royal Bengal Tiger: an ageless chronicle of the soul of India. WorldAtlas. https://www.worldatlas.com/news/a-spotlight-on-the-bengal-tiger-a-story-of-the-soul-of-india.html

Shaikh, A. Page last modified: 2025 January 28. The British plunder: how colonial rule drained India's wealth. Radiance Viewsweekly. https://radianceweekly.net/the-british-plunder-how-colonial-rule-drained-indias-wealth/

Shukla, S. Page last modified: 2024 December 9. Embracing globalisation or losing identity? The impact of westernisation on Indian Youth. Organiser. https://organiser.org/2024/12/09/268540/bharat/embracing-globalisation-or-losing-identity-the-impact-of-westernisation-on-indian-youth/

Singh, N. 2022. British forest policy in India: the imperial dilemma. International Journal of Science and Research. 11. doi:10.21275/SR22128085602

Sullivan, D.; Hickel, J. Page last modified: 2022 December 2. How British colonialism killed 100 million Indians in 40 years. Al Jazeera. https://www.aljazeera.com/opinions/2022/12/2/how-british-colonial-policy-killed-100-million-indians

Whitaker-Guest, L. Page last modified: 2024 October 15. Sacred returns: the American bison, prophecy and history. The Gale Review. https://review.gale.com/2024/10/15/the-american-bison-prophecy-and-history

Yarlagadda, K. Page last modified: 2022 July 27. How religious worship is boosting conservation in India. BBC. https://www.bbc.com/future/article/20220726-how-religious-worship-is-boosting-conservation-in-india

Zak, J.M. 2020. Distinction between Indigenous and Western cultural conceptions of the Earth and its relation to the environment. Student Publications. 883. https://cupola.gettysburg.edu/student_scholarship/883

Zimmerman, O. Page last modified: 2022 January 24. Conservation refugees: the insidious nature of Western conservation regimes. Currents: a student blog. Exploring the intersections of water, people, and the environment. School of Marine and Environmental Affairs, College of the Environment, University of Washington. https://smea.uw.edu/currents/conservation-refugees-the-insidious-nature-of-western-conservation-regimes/

The Return of 131 Artifacts from the Wounded Knee Massacre

BY MIA FEROLETO

On the morning of February 24th, 2022, my plan for the day was to drive from Chester, Vermont to Barre, Massachusetts, where I had finally gotten an appointment with members of the Board of Directors of the Barre Museum Association to view the Lakota artifacts that they had held in the town library for over 100 years. These precious treasures had been stolen from the dead at the site of the Wounded Knee Massacre in December 1890 and were sold to a man from Barre named Frank Root. A traveling salesman, Root would set up exhibitions of his collection in various retail establishments as he made his rounds to various emporiums around the country. The artifacts were used as a means of attracting curious citizens who wanted to have the opportunity to take in Native American culture and stories within the safety of a department store. Root donated the artifacts and some remains to the Woods Memorial Library in 1892, two years after the Massacre at Wounded Knee.

I first heard of the Wounded Knee Massacre artifacts being held at this strange little library/museum in Massachusetts that was only open a few days and hours each year in 2018. Vermonter Mary Collins had told me about it over breakfast one Sunday morning shortly after my return to Vermont from my first visit to the Pine Ridge Reservation in South Dakota. The town of Wounded Knee, which sits on the edge of the Wounded Knee Creek, is part of the reservation and is perhaps the most famous icon around the world for the deaths caused by land grabs, settler abuse, and genocide of Indigenous Peoples. Over 300 innocent women and children along with their men were slaughtered by the 7th Cavalry on December 29th, 1890. Mary had been traveling out to the Pine Ridge Reservation for 15 years where she volunteered and was in the process of attempting to start a tiny house project to create much needed additional shelter on the reservation. She shared that an appointment was needed to view these artifacts and that members of the board of the Barre museum would stand guard while you visited with the collection. Mary brought Lakota friends out to Barre to view these artifacts which were extremely emotional events for tribal members. Imagine coming upon a pair of moccasins or a shirt that had belonged to a family member that was now encased in glass and wood a couple of thousand miles away from home?

At the end of our breakfast, Mary Collins asked that I look into these artifacts from Wounded Knee. She said she thought that I might be able to help with their return. That was in the fall of 2018 and by the end of November 2018, I had packed up my belongings and moved out to South Dakota to live for a year. The emotional and spiritual pull was so profound for me that I had no other choice but to go.

I settled in a little town on the edge of the Badlands National Park called Wasta, or "good", and felt at peace. Wasta is a quiet place with under 100 people living within its boundaries. The highlights are the U.S. Post Office and the Wasta Bar, which boasts a T shirt that says, "I Got Wasted at the Wasta Bar". It is located directly off Interstate 90, so there are plenty of tourists who make the stop for beer and burgers. There was something about Wasta that seemed familiar to me, yet I could not quite identify it. I sat at my desk working on New Ob-

Mia Feroleto *is the publisher of New Observations Magazine www.newobservations.org. She is a contributing journalist to the Native Sun News Today in Rapid City, South Dakota and is working on an upcoming book on the return of the Wounded Knee Massacre artifacts.*

servations Magazine, which I took over as publisher shortly before moving out West. A large cottonwood tree grew outside my window and many hours were spent examining it inch by inch as I wrote articles on the human condition and consciousness. I had been born a mystical child with highly developed intuitive skills. I do not want anything to interfere with the impressions and spiritual guidance I receive throughout the day. I believe it is one of the key characteristics of what has formed the foundation of my relationship with the Lakota people.

One wet spring afternoon, I sat at my desk in Wasta and realized that the cottonwood tree outside my window was the very tree outside the motel room that Val Kilmer's character lived in for the movie *Thunderheart*. This film had inspired me when it first came out in 1992 and depicts the story of the death of two FBI agents on the Pine Ridge Reservation in 1975 during the time of the American Indian Movement and their support of Native people who were being terrorized by Guardians of the Oglala Nation or GOON Squads organized by then tribal president Dick Wilson. I was living in the exact room the Val Kilmer character lived in for the film and Spirit had brought me directly there. It was clear to me that I was in the process of finding out about the specific calling I was being tasked with undertaking for the People, although I did not yet know what it was back in 2019. It took two more years for Spirit to identify exactly what was being asked of me.

By April of 2021, I was back in Vermont and recovering from heart surgery. Intuitively, I felt that this surgery symbolized the healing of my heart in some profound way. I had been renewed in order to go out to the Black Hills, the heart of the world, for a specific reason. This included holding my fourth conference on consciousness on the Pine Ridge Reservation.

Conference attendees visited the site of the Wounded Knee Massacre and ley lines expert Peter Champoux discussed his thoughts on the shifting of the earth lines as a result of the massacre at Wounded Knee. The massacre was so horrific that it knocked the earth's energy lines out of alignment. Peter shared that the town of Wasta is at the center of the sacred sites in the area and that the bringing together of the people at our conference helped to energize spiritual movement in a positive direction. The spark of some dormant knowledge or understanding was lit for me in a subtle yet profound way and I knew that when I returned to Vermont from Pine Ridge, I would pursue the return of the Wounded Knee artifacts.

As the Lakota know, we are all related. Everyone and everything is connected to everyone and everything else. The earth, the wind, the water, the animals are all intricately woven into our daily existence and all that is. I had received the insight that these artifacts, sacred to the Lakota Tribes and to all Indigenous People, had been trapped in Barre, Massachusetts for over 100 years and needed to be repatriated to their rightful owners. Upon my return to Vermont, I called the Barre Museum Association in an attempt to set up an appointment with their board and see these sacred items.

After almost six months of contacting them, I was given an appointment for Wednesday, February 24th, 2022 at noon. I had been warned by people on Pine Ridge that it was potentially dangerous for me to touch the artifacts or even to be around them as these objects possessed power and were not to be taken lightly. Intuitively I understood this to be true, but I was clearly told by Spirit that the Ancestors were waiting for me and saw the road ahead even if it was not completely clear to me. Even tribal lawyer Andy Reid emailed me to warn that people have taken ill and even died from disrespecting sacred objects and artifacts, yet I felt safe. The Ancestors were continually around me, sending messages and guidance and even providing words as I drafted my correspondence with the Barre Museum Association. There were times when my room was so packed with the Ancestors, I felt that I could barely move.

The drive to Barre took approximately two and a half hours and when I arrived, I took the elevator up to the meeting room on the second floor that was around the corner from the Wounded Knee artifacts. That morning, I sat with members of the board of directors of the Barre Museum Association. It was a contentious meeting. I admit that my opening salvo was direct and without much courtesy but after 130 years, it seemed to me to be the only approach to take. The board was interested in returning the artifacts but said that it was a long, arduous process to identify the artifacts properly to insure that they were returned to their rightful owners. My response was that The New York Times had written an article in February 1993 about the request of the return of the artifacts and that was almost 30 years ago. I explained that I publish New Observations Magazine and that we were producing an entire issue on the Wounded Knee Massacre and the return of these artifacts and that I would not stop until they were returned to the Lakota people. My words were that it was morally and ethically wrong for them to hold onto these artifacts and that they had the choice to decide how they would be remembered. The Barre Museum Association could do the right thing and inspire others to do so too by returning the artifacts or they could become known as the next generation of perpetrators. The choice was entirely up to them. From there, we entered the room where the artifacts were housed. With the aid of flashlights, we were barely able to identify what we were looking at.

The collection was housed in a long, narrow room that had no climate control, little light besides a few sconces, and heavy blinds to keep out the rays of the sun. I was struck by the dimensions of the room which mirrored the size and shape of the mass grave at the Wounded Knee Memorial. Something happened in the moment which came directly from Spirit. Suddenly, after an intensely stressful meeting, the mood lifted once we were with the artifacts. I received the message that the Ancestors knew they would be going home, and they were happy. The message came through loud and clear. Even the members of the board from Barre felt the mood lifting and we all began to relax. For me, it was the confirmation that I needed to pick up the proverbial ball and run with it.

Upon returning home to Chester, I called Henry Red Cloud and asked him if he would come out to Barre, Massachusetts to see the artifacts and meet with me and the board of the Barre Museum Association. Henry's response was, simple—"When?" We decided on April 6th, 2022, six weeks from then. A call to action was sent out and plans were made to produce a press conference for the afternoon of April 6th, following the board meeting at the library.

"This is a call to action loud and clear."

"On February 24th, 2022, I had the opportunity to view the collection of artifacts and remains taken from the dead at the Wounded Knee Massacre in 1890 and held at the Barre Museum Association in Barre, Massachusetts for well over 100 years. Apparently the diggers of the mass grave at Wounded Knee dug a separate hole to hide their loot and retrieved it once the area had calmed down post-massacre. As the publisher and editor of New Observations Magazine, I have covered the Pine Ridge Reservation in depth and have divided my time between Vermont and South Dakota for the past four years. We have written extensively on the Lakota history and current challenges in the pages of our magazine. Our next issue is planned for May, 2022 and will focus entirely on the Wounded Knee Massacre. It will include the Barre Museum Association and its history with the people of Pine Ridge as a primary topic of interest."

I began to contact the press and pitch stories to the media. A local writer interviewed Henry Red Cloud who described the Ancestors as being in hell because they did not have their belongings in order to make the journey home. I raised the funds to cover the cost of Henry's travel and also the travel for a member of the Cheyenne

Sioux Tribe to attend. My quote about "the next generation of perpetrators" was used for this article and became a resounding refrain for articles published around the country.

Throughout the seven months I spent organizing the efforts to return the Wounded Knee artifacts, I had tried repeatedly to contact the Office of Historic Preservation for the Oglala Sioux Tribe. Specifically, I asked for a letter of authorization naming me as an official representative of the Oglala Sioux Tribe. This was important because members of the Barre Museum Association were trying to eliminate me from participating in the repatriation. I did not speak to Justin Pourier, the 5th Member of the Oglala Sioux Tribe, until April 5th, the day before the meeting and press conference planned in Barre. I had rented the town hall on a Wednesday afternoon and every seat in the place was occupied with standing room only in the back of the hall.

Justin had brought me into a Tribal Council Meeting via telephone on April 5th so that I could let them know about the work I was doing. Council members needed to discuss whether or not to give me a letter of authorization. This is the Lakota way. Tribal members make decisions together as a group. This collection represents the largest group of artifacts from the Wounded Knee Massacre assembled and returned to date. Keep in mind that daily life on reservations such as the Pine Ridge Reservation in South Dakota means dealing with one challenge after another. When I hung up the phone with Justin, I was given the message by Spirit that I had turned over every rock and that I had done everything I could do up until this point. The reverberations were now moving like ripples of water over the surface of a lake and that we would now see the results.

The following morning, I drove to the Woods Memorial Library in Barre, Massachusetts to find that people had already begun to arrive for the meeting. As I pulled into the parking lot, the President of the Library told me that the night before, the board of the Barre Museum Association had met and decided unanimously to return the artifacts to the Lakota people. At that moment, Spirit told me that it has happened this way so that there could be no confusion over how this event had transpired. The decision had been made before any of us had even walked into the building. Justin Pourier told me that some people back on Pine Ridge were saying that this effort had been underway for a long time. Justin's response was to say that, yes, people had been working on this for a long time, but it was only now that it was happening.

One of the first people to get on board with a story was journalist Abby Martin who had visited the Pine Ridge Reservation back in 2014 for a two-part story for her program *Breaking the Set* on Russia Today or RT. Abby interviewed Henry and I together soon after the Barre meeting on April 6th and it provided the perfect tone for all that the Lakota had been through. They had always been polite when they asked for the return of the artifacts. A number of people from Pine Ridge had made the trip to Barre to ask for the return of their ancestors' belongings, only to be turned away. It took the calling out of one of their own to drive the point home that this was no longer acceptable under any circumstances.

Museums all over the world are full of artifacts and remains that were stolen and that were in fact spoils of war and ill-gotten gains from genocide and colonization. Art making was a part of my daily life for many years and my commitment to beauty and creativity has morphed into creating beauty in the world in many different ways. Beauty is truth; it is an expression of the Divine and it was clear to me that the Wounded Knee artifacts and all artifacts and remains needed to be considered from a spiritual perspective. The Lakota know this to be true. Many cultures around the world understand that beauty and art are essential to the well-being of individual cultures. For over 100 years, these artifacts were essentially warehoused with the exception of a few days each year

when people were allowed to see them. Tribal people who made the arduous journey to Barre, Massachusetts, were not allowed to hold items or remove them from their cases. Some were piled one on top of another and no definitive inventory list existed.

Even though the board of the Barre Museum Association announced on April 6th, 2022, that they would be repatriating the artifacts from the Wounded Knee Massacre that they held in their collection, it was clear that this would not be a fast and easy process. The message was conveyed that this would take time, and an end date could not be predicted just yet. As the April 6th meeting came to an end, the President of the board of the Woods Memorial Library took me aside to let me know that together, she and I would make this happen in a timely fashion. It was clear that she wanted to be sure that the Barre Museum Association came down on the right side of history.

Repatriation took place on November 5th, a sunny Saturday afternoon at the grammar school in Barre. The return of the Wounded Knee Massacre artifacts from Barre has already inspired other individuals and institutions to act and return the spoils of war to their original communities. The integrity and justice to groups of peoples around the world when their artifacts are returned will move Spirit and the Unseen in ways we can only imagine at this time. With the return of the Black Hills to the Lakota People and the protection of other sacred sites on the planet along with protecting 50% of the earth for wilderness, we can support the space needed to heal the planet and ultimately ourselves.

The Wilderness Act as an Anti-Settler, Colonial Document

BY CLAYTON DAUGHENBAUGH

This topic is a good news / bad news story—subject to divergent perspectives. The Wilderness Act's relationship with the colonization of the continent is surely a mixed-bag. It's both an outgrowth of that imperial enterprise and a significant restraint on the consequent harm.

The Act is an effort to address the settler-colonial impacts on the other-than-human world. It's pretty good at that. But the Wilderness Act does not address settler-colonial impacts on the Indigenous humans that have been here long before the settlers. This is a problem both for the oppression it ignores and because the problems brought to the other-than-human world by settlement generally proceeded in tandem with the human oppression. Genocide and ecocide were paired (For a discussion of this pairing and its ramifications I recommend *Abundant Earth* by Eileen Crist (2019)).

In this essay, I suggest that the Wilderness Act is simultaneously an Anti-Settler and Colonial Document. The plain language at the beginning of the Act illustrates the point. It was passed "in order to assure that… expanding settlement and growing mechanization, does not occupy and modify all areas… leaving no lands in their natural condition…" (Section 2(a)). Clearly, at the get-go, the law is intended to address the harm being done to the natural world by the settlement of the United States. Its target is the tendency towards over development and domination of the other-than-human-world evidenced in the growth of what had become the USA. It is that society to which the Act addresses itself.

The assertion that big W wilderness contains substantially anti-settler elements seems counter-intuitive given the contemporary conversation arguing the Act is instead an assertion of colonial oppression and erasure of Indigenous Peoples. While not letting the Act, elements of its subsequent use, or the broader wilderness movement from which it emerged off the hook, it is worth taking a look at the liberative elements of the document.

The Act's opening clauses frequently utilize power language contrasting the other-than-human world with expansive behavior of U.S. society including what is probably it's most well-known phrase: "a wilderness, in contrast with those areas where man and his own works dominate the landscape is… an area where the earth and its

Clayton Daughenbaugh *a member of the Sierra Club's Wildlands and Wilderness Team*

community of life are untrammeled by man…" (Section 2(c)). Here the Act is an effort to preserve the freedom of the natural world and resist the dominating tendencies of the settler colonial expansion oppressing other lifeforms. The Act seeks to restrain the Western presumption of a human "right" to economic and recreational exploitation of land and species, the spread of which across the continent is the recognized threat to wilderness. The word "untrammeled" reinforces this message, highlighting the lack of human control in wilderness as contrasted with areas where settlement and mechanization dominate.

As is often noted, "untrammeled" does not mean pristine and untouched. In fact, as used in the Act, it presumes some level of human presence—a restrained presence. Hence the phrases "where man himself is a visitor who does not remain" and "without permanent improvements or human habitation" (Section 2(c)), both of which presume an un-dominating degree of human presence on the land. This point deserves emphasis. These words and phrases do not mean no people, they mean a presence of people that is restrained and respectful of the land as home for the other-than-human. The specific target of these phrases is the impacts of settlement and mechanization brought to the continent by Western colonization and economic expansionism. Similarly, when thinking wholistically about the continent, the Act does not claim that wilderness places ever were, could, or should be everywhere. Rather, in the face of rapidly increasing human "works that dominate the landscape" driven by "increasing settlement and growing mechanization" it seeks to "secure… an enduring resource of wilderness" amidst the spectrum of human activity" (Section 2(a)).

Many see a denial of Indigenous presence and influence in those phrases. However, it is Western settler forces the Act is addressing. Such phrases are an affirmation of the value of creatures' natural place as the dominant lifeforms within substantial areas (not all areas) over the course of human existence. They are a call to respect the homes of plants and animals in the face of widespread intrusion and domination. Visitors acting respectfully come from their own place but they don't take over, they don't stay indefinitely.

To sum up, the Wilderness Act is an effort to blunt the impact of settlement and mechanization on the natural world as it was occurring in the mid-20th Century. Its language is explicit in trying to maintain the overriding role of nature in areas designated as Wilderness and is specific in the restraints it puts on that settler activity. Central threats were development and activities such as roads, vehicles, logging, and parking lots. The Act does not address Indigenous practices on the land that occurred prior to being overrun by settlement. Indeed, its language is largely ignorant of these practices. It thus serves as a Western mechanism to restrain and limit the extreme impacts of settlement and mechanization on the natural world.

This movement to free the natural world from the oppressive overreach of settler-colonialism also begs the question of the settler relationship with their fellow humans indigenous to the continent. Ironically, in recognizing the need to protect the natural world from settler society the Act is an implicit acknowledgement that pre-settlement Indigenous Nations were better at practicing restraint and respect. Its provisions offer a means of protecting the character of places important to Indigenous Peoples and Nations. The Act upholds as a model the "primeval character and influence" of wilderness, areas which were more widespread prior to the arrival of the colonial enterprise.

That such a backhanded compliment is the best the Act can do demonstrates the depth of the ethical pit in the society from which the Wilderness Act emerged. The Act values the results of the work of Indigenous Peoples while at the same time perpetrates a presumption of contemporary irrelevance of the pre-settlement people. *It hypocritically takes for granted Indigenous practices more in sync with natural ecosystems, which sustained the very wild places the Act seeks to protect, while presuming that the settler-colonial society will be able to right its course alone.* What are the odds of ultimate success with that plan, really, what are the odds?

Even the most cursory review of United States history will perceive that genocide and ecocide proceeded in tandem across the continent. It stands to reason, or should for friends and advocates of wilderness, that promoting justice in the face of the genocide is vital to attaining justice in the face of the ecocide, and vice versa. Restraining the blitzkrieg of settlement and mechanization requires a reassertion of Indigenous sovereignty alongside the corrective self-restraint manifest in the Wilderness Act. Genuine co-management is a means of healing the land and the people. This was a central theme of the work involved in promoting the Bears Ears National Monument, which modeled further monument designations in the Biden administration. Greater sovereignty also suggests the return of currently private lands owned by settler descendants and corporations into Indigenous stewardship as a helpful component restraining the domineering and ultimately suicidal trajectory on which the path of "expanding settlement and growing mechanization" has placed us. It is the hegemony of private ownership, completely supplanting Indigenous interests, which is the chief enforcer of marginalization.

We need more wilderness. But wilderness isn't sufficient alone, it can't be the only way forward for the other-than-human world. Additional legislation, with an organic act similar to the role of the Wilderness Act, establishing tribally led or co-managed cultural landscape protections for public lands would be a good complement. A means of returning Indigenous sovereignty to landscapes privately owned by the inheritors of settlement would be a blessing. A good start might target inholdings within reservation lands as well as adjoining lands such as the

checkerboards of ownership scattered across the landscape. Growth in contiguous tribal control is a plus. We need more of both Wilderness and indigenously managed spaces if we are to successfully address the apocalyptic crisis pair of climate change and mass extinction. In my view the wilderness movement and the movement to increase lands under tribal sovereignty are, or should be, natural allies.

Our planet and humanity are on a destructive course brought on by "expanding settlement and growing mechanization". We need the restraint Wilderness provides. We need greater recognition of inherent Indigenous sovereignty. We need both if we're to reverse the onslaught and preserve humanity's place on the planet.

References

Crist, E. 2019. Abundant Earth: Toward an ecological civilization. Chicago, IL : University of Chicago Press.

Enlightenment Traditions Meet Native Wisdom

BY CONNIE ZAREEN DELANEY

Who Are We?

Retelling our foundational stories can change our sense of who we are. Are we good? Or are we bad? Where do these ideas come from? Are there other possibilities?

Many of our foundational stories come from the predominant religions (Christianity, Islam, Hinduism, or Buddhism). These stories imply that humans are faulty by nature and need to be fixed. The conditioning from this goes deep. Some religions say that good people go to heaven, and bad people go to hell. Others assign an intrinsic faultiness to the regular guy but offer an escape from this faultiness into a nirvana or perfected enlightenment state.

As I look further, though, I find stories from Native and Indigenous speakers who speak from a worldview where everything fits and belongs the way it is… including humans. In this worldview, there is no need for labels like good and bad. Humans are simply one of many conscious beings. We have little peculiarities that can cause big problems, but we belong and fit in the grand scheme of things just the way we are.

Can these two stories meet?

Discovering Unity

I've been studying unity my whole life, sometimes without knowing it.

I started by dropping out. As a young hippy girl in the early 70s I felt something was wrong with society. I knew I had been conditioned, which meant that down under the conditionings there must be a point from before that happened—a point where the natural human abides. I had no idea how to find this true self. I put on a back-pack and walked into the mountains where I lived as naturally as I could muster for many years. Like peeling an onion, the trappings of civilization thinned and fell.

To make a long story short I found an Enlightenment teacher, did the studies, and learned how to drop the conditioned mind. It would take too much space to really explain this, but do know it was not what I expected. This thing they call Enlightenment is simply that natural state I was looking for to begin with. Yes. I was quite surprised.

During my time of studies, I was steeped in the philosophies and ideas of eastern religions. I had the same perspective that Buddha and thousands of masters before me had expressed. My experience was one of simplicity and total belonging, but something seemed wrong and missing.

A puzzle piece didn't fit.

Connie Zareen Delaney *is a Nonduality Teacher and Dances of Universal Peace Leader at Mystic Dance Caravan, 216 Stevens Ave, Salmon, ID 83467, USA. Tel: 208-756-3076. Email: mapremzareen@gmail.com.*

As time passed, things kept changing in our world. The 70s moved through and became the 90s, and then a new century rolled over. Previously hidden voices rose from the land's native people. Many had been captured by boarding schools and finally released. They returned to their reservations. In spite of the trauma of their immediate situation they found the wisdom of their elders still intact. Their voices started coming together and they began bringing out new stories of who we are.

I discovered these stories, first, as a tiny trickle in the popular book Braiding Sweetgrass by Robin Wall-Kimmerer (2013); and then like a river as I dived deeper, I found Tink Tinker (2020), Tyson Yunkaporta (2019), Ilarion Merculieff (2016), Wahinkpe Topa (Topa and Narvaez 2022), and Tiokosin Ghosthorse (https://www.firstvoicesindigenousradio.org/).

Science also started telling a new story about who we are. I found books from anthropologists like David Graeber and David Wengrow (2021), and research of the deeper nature of women and children presented by Darcia Narvaex (Narvaex and Bradshaw 2023) and Cat Bohannon (2023). Through these stories I recognized that the Native worldview was the same as the Enlightened state… but intricately tied to nature and landscape. The trickle grew into a stream, and then a river. As I listened to these voices all the pieces of my own experience came together. I discovered that going into deep time rewrites who we are. It's a gentle step beyond good and bad. With this new story, humans can be something we like and celebrate. Let's get a taste of that right now and retell the story of Enlightenment.

This story doesn't have to be true or false because it is simply retelling how we see the human of long ago. Take it in like a small child listening to a picture book. Snuggle up in your comfy chair so you can fill with the sounds and smells of a good story. It's the same story you've heard before but with a longer timeline and more vivid pictures.

Retelling Buddha

To begin we need to go way back in time… long long before Buddha was born.

Before Long Ago

In a faraway land, long long ago, there was a fertile valley with people who had lived in tribes for a hundred thousand years. These people left no trace on their landscape because they didn't build or write. They lived within their food system. Their inner experience was much like ours. They had big brains but education didn't come from books. It came from nature and the land itself. They used their wisdom to thrive within the living ecology; they were an integral part of the grand design that was always moving and interconnected.

At this time humans were not the dominant species. They lived in relation with the winged brothers, the crawling sisters, the fish, the trees, the plants. Their language was simple sounds that painted how reality moved and related. Each person knew who they were and how they fit in. They understood that they were not the most intelligent creatures around, even though they had such big brains. Those big brains saw relationships everywhere. Everything had spirit and spoke in its own way. Everything had wisdom in its own way. They believed birds could teach, so they would listen. They knew that plants and animals could teach, so they would listen.

They didn't own land. They didn't own plants or animals. They moved within their food system to feed the people. Everybody worked together to bring food, create togetherness and give thanks. They knew when things would

be ripe over here, and then they could go. They knew when the fish would be running fat and strong in the rivers, and then they could go. They knew where the animals would come and when.

They lived within their landscape with full consciousness. Every part of their mind was awake, engaged and alive with intelligence. They could see the connections that run through everything. They knew who they were—they were awakened, aware spiritual beings.

Conquering Hordes

Then, one day, a different kind of people swept into the land. These people had become caught up in hierarchy and the disease of "better than." They craved owning more and more. They conquered the open spaces with brutality. They took the land and turned it into property. They tied up the food system. Now everything was separate and owned: rice was grown over here, sweet potatoes over there, animals lived in pens. Everything was owned.

The conquering hordes turned the people into slaves, which made the conquerors rich. The divided minds of these conquerors saw everything in the world as things. These conquerors built and lived in beautiful, large, and luxury homes, and every little thing was taken care of. They lived in this luxury, while the people they had conquered were living in poverty and agony.

Over the centuries, the people forgot who they were. The old language was gone so thinking lost movement and connection. The new language was about nouns and things. The original people started believing in the gods of the conquerors. These gods told them who was who, who was important, and that they were not good enough.

Life was a struggle. Living lost its purpose and didn't make sense. Disease and death caught them by surprise now because the big picture was lost. In time all the people, conquerors and conquered alike, believed that the only way out of this suffering was to achieve a rarified Enlightenment, which promised an escape from the struggle. They prayed to outside gods and gave offerings.

In this society, where everyone had forgotten who they were, there was one young man who was born into a rich family. He belonged to the conquering class from so long ago that nobody remembered how it started. He lived in a big, beautiful house, and everything he could possibly want was taken care of for him. Everything was perfect. Then one day, he decided to go on a trip outside of his beautiful home. He went out and saw the incredible poverty and agony the people were living in. It shocked him because he was a sensitive and thoughtful man. He couldn't believe it; it was the first time in his life he had experienced this level of agony and horror at life itself. It broke him.

He was a Hindu, and Hinduism is about becoming enlightened. That seemed to be the only escape from this agony. He left his home and went into the forest to live with the ascetic meditators there. He was a bit competitive, so he became the best of them all. He did the most prayers and ate the least food until finally, he was eating one grain of rice a day and was on the verge of death. He went over and sat by the river, watching the river flow. He saw a boat come down the river; it avoided a rock, went around, and floated on down. Suddenly, he realized, "There is a middle way!" You can live *within* the river of life and go in this middle way. He was having a glimpse of the natural inner soul of his long-ago ancestors, the way of seeing the timelines that run through things.

So, he left his friends, started eating actual food, and searched for this middle way. Then one day, he sat down by a tree and decided, "This is it. I am not going to move until I figure this thing out." He sat there. The moon rose, the stars rose, and then he spontaneously relaxed into his being. In a flash, the noun language paused, and all the definitions in his mind fell away with a crack. He saw who he was—a natural being floating within the middle way. Specifically, he saw his conditioned mind as an illusion and its hold upon him lifted, revealing him as the natural true human being within. Boom! Enlightenment.

He was Siddhartha, the Buddha. He had discovered the inner, awake, nature that exists in the human heart when the language of division and duality stops. That quiet place where reality is within as well as without. For him it was complete silence because the language of his long-ago ancestors was gone, and he was by himself without elders and culture. The silence was beautiful and full.

He started gathering people around him and teaching them this middle way. He went back to his friends in the forest and said, "Dudes, look, this is really easy. Let me show you how to do it." He gave them instructions, and boom, it happened for them too. People around him were becoming enlightened and waking up to their true nature.

They had discovered a place of zero conditionings where a human being can find inner truth. What he didn't know was that this had been the natural state of people thousands of years ago. It was still available within the human heart because it is the place underneath language. It's the place of silence.

One thing Buddha didn't have, and couldn't imagine, was an awakened culture with threads of wisdom back to the beginnings of time. There were no elders to explain the full deepness of unity to him. He didn't know that plants and animals can talk to those who know how to listen. He only had his own experience so he had to piece it together from the things he could see and be.

He didn't have an ancient culture to welcome him home.

What is Ancient Culture?

Human knowledge thrives on the stories that tie us together. Before we started writing things down in books, knowledge and the people who held it were inseparable. It was held in a community that lived in harmony with a landscape.

Our deep ancestors were not savage brutes but were intricately wise storytellers. They held a thread we rarely understand these days. Unlike our books, elder wisdom passed on much more than words. It was also full of intuition and imbued with a deep understanding of connection.

These things were so intricately intertwined that through our entire prehistory there was only one thing happening: nature, humans, culture, food, people, wisdom, knowledge, intuition, babies, elders. It all happened in relation to the living world around us. From over a hundred thousand years ago to maybe five thousand years ago this is how people lived. It was a circle of connection between all things. It's an intricate balance. Break one part of the circle and you break the circle. People became orphans living only in the concepts of words.

The natural people who had lived in harmony with the land thousands of years ago lived within a context of unity. They knew that the ancestors who came before them, were them. They knew that the people around them were them. I am you, you are me. They had elders and families who knew how to speak in a language of inter-connection. All together the women, the elders, the supporters, the healers... everyone knew how to bring a child

naturally into this state. Humans together were a living breathing entity of unity. It was a system that sustained itself.

These ancients lived lives where time, location, and reality met because elders were always teaching the young, and the young brought life and joy. Culture comes from this great interweaving of human inner and outer elements.

Buddha in Silence

Buddha didn't have this. He had no idea that his Enlightenment was a natural state. His awakening felt natural, but he had no idea that for hundreds of thousands of years, humanity had lived in this natural state. He didn't know that his experience was the human reality before his conquering ancestors swept into the land with private property, philosophies, and gods. It felt like something new. He didn't know that when he broke with his conditioned mind, he was unraveling himself from the language of division, which had caused his mind to be stuck in loops of definition. The only thing he knew was how this state felt because that was the only perspective he had, and so Buddhism started. The experience was a beautiful silence.

This Enlightened state, instead of being seen as the natural birthright of every human being, was seen as a rare accomplishment for the select few. Instead of being anchored in the deep past it was assigned to a nebulous future.

All the people who wanted to become enlightened isolated themselves inside monasteries so they could be free from the divided world and come to this inner space. Buddhism grew as a philosophy that set Enlightenment as an accomplishment in the distant future rather than as roots of consciousness from the past. Meanwhile, the conquerors kept expanding around the planet until, a few hundred years ago; they came to what we call the Americas, Turtle Island.

When the conquerors arrived, they found human beings living within their ecosystem as fully awake, conscious beings. The conquerors grabbed the land, turned it into private property, and enslaved the people. They shoved them to the side, stuck them in poverty, and did everything in their power to wipe out the ancient teachings. Those conquerors are us, the White, non-Native people living here on Turtle Island.

Why This Matters

Now it's time to come back around to the present day and put Enlightenment and Native wisdom together as partners in the awakening of humanity. These are not two different philosophies but are two ways of finding the same field of unity that ties all life together. When we start looking at it this way it makes Native wisdom accessible to non-Native people, and opens up the possibility of true advocates of the natural world becoming allies.

Native wisdom can't effectively reach those of us who come from a broken culture. It is intricately united with a living landscape, elders and a clan-based sense of self. The Native unity is tied to living clans and tribes who still hold their elders and ancestors. Those of us descended from the conquerors of land can't tap into that sense of self without being untrue to who we actually are… No matter how hard we try, we can't find truth by living a lie.

Like Buddha, we don't have living elders. But each of us can still experience unity. When we understand the silent nature of Buddha's Enlightenment then each of us can find the zero point underneath the conditioned mind. We can take the idea of Enlightenment out of the future and anchor it into our living past. Techniques for reaching enlightenment become the roadmap for stepping into this field of unity. Suddenly the techniques will work.

When we change the story of "who we are" in this way, then awakening becomes accessible to those of us who are the descendants of the conquering hordes. We'll be able to rejoin nature as participants rather than owners.

If we change Enlightenment from a rarified experience to the easy natural state of humanity, then we can start to find elders to guide us. We have many elders from the Enlightenment traditions. The saints and prophets from all religions start to make sense. Our concepts of who we are grows into a deep goodness we never knew before. With this change of consciousness, we'll be able to truly hear Native voices.

This is the place where ecology starts.

Understanding Buddha in the Native context gives Enlightenment seekers a true path to unity and brings Native wisdom to the forefront. It brings the importance of language and culture back to the conversation. We can reveal what is naturally inside us. We can find ways to express it and be it.

This stops the struggle of good and bad. This story puts religious dogma into a new light. It gives us a ground to stand on while we learn how to remake ourselves back into the fully integrated conscious beings that is our nature. Anyone, from any faith or background can crack through the divided mind. As Buddha showed us, it can be done very quickly.

The world of nature stands ready to welcome all people home. Spread this natural being of Enlightenment and we will all find a way, together, to come back into harmony and balance.

References

Bohannon, C. 2023. Eve: How the female body drove 200 million years of human evolution. Random House Canada.

Graeber, D.; Wengrow, D. 2021. The dawn of everything: A new history of humanity. Penguin UK.

Kimmerer, R.W. 2013. Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants. Milkweed editions.

Merculieff, I. 2016. Wisdom keeper: One man's journey to honor the untold history of the Unangan People. North Atlantic Books.

Narvaez, D.; Bradshaw, G. A. 2023. The evolved nest: Nature's way of raising children and creating connected communities. North Atlantic Books.

Tinker, G.E. 2020. American Indian liberation: A theology of sovereignty. Orbis Books.

Topa, W.; Narvaez, D. 2022. Restoring the kinship worldview: Indigenous voices introduce 28 precepts for rebalancing life on planet earth. North Atlantic Books.

Yunkaporta, T. 2019. Sand talk: How Indigenous thinking can save the world. Text Publishing.

Toda Sacred Geography:
A Method of Wilderness Stewardship

BY TARUN CHHABRA

Abstract

A study of Toda sacred geography provides modern global society an Indigenous People's pathway towards stewardship of wilderness. It was Indigenous People's management practices that contributed towards the Toda landscape being declared as the core area of India's very first biosphere—the Nilgiri Biosphere Reserve (NBR) in 1986 under the UNESCO Man and Biosphere Programme. The Mukurti National Park, which lies at the heart of the NBR, houses over a dozen of the Toda deity hills, as well as their afterworld, with all the spectacular mythical landmarks to be crossed by a departing spirit, seen as actual physical landmarks along the way. Much of the flora and fauna in this landscape is endangered and endemic to just a small area but they are connected with Himalayan species, although a vast distance separates them. The Todas' generally vegetarian, non-martial, non-hunting, pacifist lifestyle, along with their intricate links with nature has undoubtedly played a role in preserving the sacred biocultural diversity of this area.

Introduction

The Indigenous Toda People of the Nilgiri Hills in South India who have lived there for millennia have sanctified numerous features of their homeland. Like many Indigenous cultures, Toda sacred geography is a result of the elaborate convergence between mythology and landscapes, and this confluence brings forth how the Toda People have mapped their homeland through precise toponyms. Following the norm, Toda cultural geography too has both sacred and secular aspects and these are clearly demarcated, especially around Toda hamlets where regulations are continually enforced.

Sanctified Toda Landscape

Modern geography is the description, study, and classification of the landscape and its features bereft of sanctity, although it does depend upon some nomenclature that could use traditional Indigenous knowledge and terminology. An alarming trend is the incorporation of non-Toda names for myriad aspects of the sacred geography. In my study of Toda sanctified hills (Chhabra 2015), just one name has entered into common and formal usage, i.e., Pehn-Mukurti and I have appealed to the Survey of India to rectify this error by incorporating the original Toda nomenclature in their next edition of Nilgiris maps. Similarly, the major rivers of the Nilgiris—the Kawllykeen and the Kinatthill(zh)y are commonly known by their non-Toda names, Pykara and Avalanche, respectively, although they represent major deities to these people, with formalised crossing points across their courses. Many of the Nilgiri river systems—the two most sacred and several others—along with their crossing points, as well as some other streams, pools, springs and waterfalls that are related to mythical events, feature in numerous clan and hamlet prayers. For example, the pool called Nerykaihhrr, where Goddess Taihhki(r)shy

Tarun Chhabra is a dentist and founder of the Edhkwehlynawd Botanical Refuge (EBR) Centre Trust; the Toda Nalavaazhvu Sangam (Welfare Society) and the Nilgiris Kuttawddy Centre, Ooty, Nilgiris, South India.
E-mail: kwattein1@gmail.com; tarunchhabra@ebrtrust.org

is believed to have created the buffaloes, is mentioned in the Nawsh hamlet prayer. Similarly, the stream called Naihrrot-kwehhdr, where God Kwattaihh is said to have tied down the reflection of the sun, thus turning daylight into momentary darkness, is mentioned in the Konawsh hamlet prayer.

It would not be an exaggeration to say that many locally sacred waters form an integral part of Todas' everyday lives; they constitute a vital component of their traditional culture. The sacred buffalo herds of different grades, along with their associated dairy-temples, constitute the mainstay of Toda religious activity. However, the sanctity of these two cornerstone elements is conserved primarily by the related sacred waters, together with the maintenance of ritual purity by all those in physical contact with these elements and by the use of certain plant species. For example, in the absence of locally sacred waters, no dairy-temple could ever be operated because: (a) the priest could not be ordained, (b) the focus of divinity, the sacred dairy items and vessels, could not be purified, (c) the sacred milk could not be churned, (d) the sacred food could not be cooked, and, finally, (e) the salt-giving rites for the sacred buffaloes could not be performed. As urban dwellers the world over become more and more accustomed to water flowing through pipes and out of faucets, they need to understand and learn from the sacrosanct relationship that Indigenous people have had—and still have—with their surrounding water bodies. They need also to be reminded that people like the Todas actually utilise only a minuscule portion of these waters that they have guarded for millennia.

Although many branches of geography are scientific in perspective and method, they are devoid of the meanings and emotions that myth, memory, and association bring forth to frame a unique human perception of Nature. Many sacred sites and landscape features are regularly consecrated by rituals and prayers—both by priests and laypeople. A typical Toda prayer consists of sacred chant words (*kwa(r)shm*) addressed to mountain gods, along with other natural landmarks, like nearby summits, varied slopes, valleys, ridges, shola thickets, swamps, specific sacred trees, rocks, swamps, meadows, pathways, grassy promontories, rivers (each section has a different name), pools, springs, and streams. There are sacred incantations also for the dairy-temple, buffalo pen, pen-posts, pen-post bars, and other dairy-temple items, including the foci of divinity, like ancient bells and earthen pots inside (there is no form of idolatry in their culture). Upon analysing Toda prayers, we find a corpus of sacred names for several hundred natural features; important aspects of Toda sacred geography have been mapped through our attempt to identify the named features that have survived the ravages of the recent march of civilisation. Of the natural landmarks, hills are the most sacred entities and represent a major and a local deity, along with a number of other nearby sacred peaks of varying levels of sanctity, mentioned in the prayer of each hamlet.

Consequently, any attempt to reconstruct traditional Toda cosmography must begin with the deities who dwell in revered mountains and created the sacred buffaloes whose milk is ritually processed in the dairy-temples, which results in the Toda ethos. Toda temples facilitate the concentration of energy centres in their surrounding sacred landscape, which is the real manifestation of divinity. Indeed, the foci of divinity like ancient bells within many temples are said to have emerged miraculously from sanctified sites, after which the sacred edifice was constructed. So, the sites of temples along with their surrounding hallowed zones also form an important part of Toda cultural geography. It is believed that the power of all these sacred sites along with that of the focus of divinity inside the temple, when consecrated by regular chanting of the dairy-temple prayer (which is directed to elements of the sanctified landscape), produces tremendous energy that a sensitive being can perceive. This prayer is chanted within the temple by performing the *koymukht* salute—raising the right forearm with palm outstretched and having the left hand touch the right elbow, while facing the sacred lamp, which itself is part of the landscape, since it is fuelled by clarified butter from sacred buffaloes grazing in the sanctified meadows. Fire for the temple

lamp is made by friction only using holy sticks of *Litsea wightiana*, which is sourced in the surrounding shola thicket. Only this flame can then be used to light the temple fireplaces, themselves using wood of specified species (varying according to the grade of dairy-temple—there are six extant grades of hierarchical sanctity, each having an associated lineage of buffalo), to be collected from the hallowed landscape. Even the shrubby species used to sweep these holy areas are specific and vary according to the temple-grade. In the evening, the dairyman pens in the buffaloes, shuts the stone gate-posts and once again adopting the *koymukht*, he loudly chants the prayer that can be heard reverberating across the sacred landscape from a distance.

I have felt these intense energy levels around many hamlets, especially those located in remote areas, where the surrounding ecosystem is treated as inviolate—where even leaves gathered from the forest and used as plates for eating should not be placed on the hallowed ground after the food has been consumed; in fact, such places are partially immune to climatic changes, as they generate their own micro-climate. Unsurprisingly, such sites are also the repositories of rich biodiversity. For instance, while in quest of a lost Nilgiri orchid, *Liparis biloba*, we finally came upon it at the seasonal hamlet, Kwehh(r)shy. I also vividly recall sitting around the outer courtyard of the hallowed conical temple at Konawsh (in the surrounding meadow, we chanced upon the endemic *Leucas rosmarinifolia*), where I closed my eyes to enter a deep state of contemplation. Upon coming out of this reverie, I was surprised to see a sambar deer stag gazing deeply into my eyes from nearby; this inter-species relationship continued for a while, whenever I resumed my meditation. This is precisely the power manifested by many revered sites, instances of which are often perceived by devout priests and related by elders (like how a Nilgiri langur, *Semnopithecus johnii*, had actually pulled the cloak off the back of an errant priest, because he had worn it incorrectly, or how the pied bush chat, *Saxicola caprata*, warns priests of transgressions committed). Three decades ago, while mapping the routes to the Toda afterworld, my mentor, Kwattawdr-kwehttnn was finding it difficult to find the mortar-like depression within a streambed, where departing female spirits are required to place the pestle that was used at their funeral rites to pound grain. This solitary site eluded us year after year. I clearly recall when Kwattawdr stopped at the area to attempt to locate the landmark once again. Introspection led me to a nearby stream where I urged Kwattawdr to dam the flow of water, which he did so with some clumps of grass. Lo and behold, the mortar-like pit appeared before our eyes.

Indeed, out of a herd of temple buffaloes, it is not uncommon for a buffalo to imbibe the surrounding transcendental energy and roam from one sacred site to another as if possessed by the energy—the Todas have a term for such a divinely-possessed buffalo: *kwehdr-ehtt-aan-muttcy*. We should be reminded that inter-species relationships—with all biota—are mundane occurrences in the lives of Indigenous folk. H.P. Blavatsky (1930) saw this for herself a century ago while approaching a sacred Toda area; the main sacred buffalo adorned with silver ornaments approached her party menacingly. After the priest whispered to the animal, the buffalo cast Blavatsky one final glance and moved back to rejoin the herd. I too have witnessed this interaction from the early days of my fieldwork: we were looking at a herd of buffalo grazing when I expressed a wish to photograph one with sweeping horns (*tezhk-ehr*). Kwattawdr-kwehttnn, who knew the animal's personal name, called it out, with the request to approach us slowly; it did so, and provided me with a great image, along with a glimpse into the way the Todas communicate not only with their buffaloes, but with all of Nature. Kwattawdr would also regularly communicate with intelligent birds and animals—I recall him telling a *kaarrpill(zh)c / kupeihh(r)shy* (male/female pied bush chat) that we were only walking past and would not disturb their nest; when the agitated birds flew away, he smiled. When we saw a *toorrunny* (Nilgiri langur) alpha-male, Kwattawdr implored it to bare its teeth, and himself followed suit after the primate had done so!

Deity Hills: the First Step of Sanctification

Toda sanctification of landscape features began when their gods—deified men and women who, after completing their lifecycles in human form—went on to occupy some prominent hilltops, where they are still believed to reside, ever afterwards furnishing Todas with potent reminders of the unity of nature and divinity. During those early times, it is said, gods and Todas lived side by side. Natural landmarks still exist that are associated with divine exploits, testimonies to their life stories that Todas remember even now. These summits are called *taihh-tehtt* or deity hills and there are over 30 of them. Their presence is so real and sacred that a Toda elder might not commit the sacrilege of using his finger to point out the location of a deity peak. Todas passing in the vicinity of a deity peak reverentially salute the summit by adopting the *koymukht* posture, as they softly chant the *kwa(r)shm* or sacred name of the deity.

Some of these deity hills are also sacred to other neighbouring Indigenous groups and are connected to ecological wellbeing of the landscape. For instance, Kaa(r)sh-gol (Nilgiri Peak; Figure 1) is one of the most important of the Todas' deity hills and is the abode of a god who is the presiding deity of the Kaa(r)sh patriclan, which shares his name. This hill is believed to be intimately related to the onset of the southwesterly monsoon, the great rejuvenator. Todas say the first mists of this monsoon swirl around this hill—like people circumambulating a temple building—before moving to another deity hill Kawnttaihh (Devar-Betta; Figure 2), where the mist similarly encircles the summit. Todas believe that, following the appearance of this phenomenon, the monsoon rains will begin. They say the mist will not leave these peaks until the southwesterly monsoon peters out; although in this age of climate change, this sometimes does not occur and is a potent indicator.

Figure 1 - First mists of the southwest monsoon circumambulate around the sacred Kaa(r)sh-gol peak. (Photos in all figures by Tarun Chhabra).

Figure 2 - Mount Kawnttaihh is the most pyramidical of all Toda sacred hills.

At Kawnttaihh hill, three conical projections may be seen on its rocky face. The Todas have a *kwa(r)shm* for each one—*Keezhkymehn*, *Kwaw(r)shy-vōh* and *Tee(r)shymudry*. They say these three conical projections store the mist, wind, and rain respectively. They believe that, while he was eating some *kaihh(r)sh* fruit (*Syzygium densiflorum*), Kawnttaihh spat out the chewed seeds, which became the mist. As he spat out the seeds, the air expelled from his mouth became the fierce monsoon wind that, ever since, has bombarded the western Nilgiris. Finally, they say, his spittle became the monsoon rain.

Although the Todas have no such beliefs, it is noteworthy that according to Indic epics, in the middle of our universe lies the lotus-shaped island called Jambudveepa, which means Rose-Apple Island. The *kaihh(r)sh* fruit eaten by Kawnttaihh is of the same genus as all Rose-apple fruits—*Syzygium*. And at the centre of this lotus-shaped continent is Mount Meru, a pyramidical peak that is said to be golden because the sun always shines upon it. The peak of God Kawnttaihh also happens to be the most pyramidical of all Toda sacred hills, and is often seen to have a golden hue, especially during winter. The cosmic mountain, Meru is imitated architecturally in Hindu temples—with their shikharas, and also in Buddhist stupas and pagodas. The Toda conical temples have been considered as primitive precursors of the South Indian temples' vimana—the conical or pyramidical tower built on Indian temples, just above the sanctum (Venkata Ramanayya 2007); their antiquity provides credence to inspiration from sacred summits.

In addition to the seasonal salt-giving rites, the pilgrimage to Kawnttaihh hill represents another way by which Todas attempt to maintain the sanctity of their environment. The priest from Kwehh(r)shy brings some milk in a narrow bamboo vessel and, at the summit of the hill, pours it onto a flat rock, while all pray. The pilgrims then dance and chant the *konn-ezht* composition in the traditional manner, prostrating themselves towards the distant hill where God Kwatteihhn resides. The pilgrims also execute the *koymukht* salutation and pray in the direction of all the major water, hill, and other sacred sites located in this area.

Toda prayer ceremonies and rituals that appeal for the perfect advent of each season, especially when performed with sacred milk as mentioned above, remind us of the Prithvi Sukta, the "Hymn to the Earth" of the Atharva Veda (second millennium BCE), verse 36:

Your circling seasons, nights succeeding days,
Your summer, O' Earth, your splashing rains, our autumn,
Your winter and frosty season, yielding to spring—
May each and all produce for us their milk!

In the traditional Toda mind, any alteration in the ecosystem around a deity hill indicates a profound sickness of the environment. Such alterations include the planting of exotic trees or tea, destruction of natural vegetation, and even when the natural or the ritualised burning of vegetation that is traditionally practised by the Todas (now proscribed) is missing.

The salt-giving rites, besides their utilitarian function of periodically providing salt to the buffaloes, are an indirect method of ecosystem management. Failure to perform them, especially at the onset of the winter and pre-monsoon seasons, is deemed an invitation for ecological ill health. This is because, Todas believe, failure to perform the *pony-up*, the winter time salt-giving rite, would result in an absence of frost and this, in turn, can mean a failure of the proper flowering cycle of some plants, thus making the impending honey and wild fruit seasons erratic. As for the *kōr-up* salt-giving, if it were omitted, Todas believe that the southwest monsoon would likely fail, thus causing a shortage of pasture and meagre milk yields, as well as a depletion of the water in the sacred brooks that is so necessary for the performance of many rituals.

The Sacred Landscape Takes Shape: Second Bond

The second irrevocable bond with wilderness was instituted by their pre-eminent deity, Goddess Taihhki(r)shy, when she miraculously created Toda buffaloes that were distinct for the dairy-temples—of different hierarchical grades—attached to each patriclan, and buffaloes for domestic purposes. She also gave sacred words to all the sanctified areas, sites and buffaloes as well as to numerous species of flora and fauna, thus ensuring their

sanctification and protection. These *kwa(r)shm* went on to constitute the core of Toda prayers and rituals (Emeneau 1974). All major hamlets within a single patriclan also have their sacred names and each has a prayer chanted by the priest that addresses myriad aspects of their sacred geography including sanctified areas and temples, since these were often *svayambhu* (self-originating in Sanskrit) sites where the focus of divinity emerged miraculously. Taihhki(r)shy was a divine but playful ruler—songs and myths mention that she created Toda customs and rituals in this spirit. This led to the second step in the creation of their sacred geography that began when their deities occupied many hilltops: hundreds of landscape features became sanctified, including over 150 other hills, numerous rocks, trees, slopes, valleys, and waterbodies. In addition, hundreds of plants, mammals, birds, reptiles, amphibians, insects, and others were given names; many were sanctified, since they needed to be used in rituals, while others were mentioned in myths or songs.

In the realm of Toda traditional architecture, not only did the goddess name the plants, but also understood which bamboo had the best tensile strength and which grass had the most efficient rain-proofing properties; she thus laid down that only particular species are to be used. As a consequence, the hamlets located in the western aspects of the upper Nilgiris are only allowed to use the endemic swamp grass, *avful* (*Eriochrysis rangacharii*), for thatching their dairy-temples.

I soon discovered that almost all Toda myths mention still-existing physical features of the Nilgiri landscape. This makes the Toda stories all the more interesting. Certainly, the most fascinating of all these sacred stories is that which describe the journey of the departing spirits to Amunawdr, the afterworld.

The Afterworld: Third Inextricable Link with Nature

The story goes that the god Aihhn, said to rule the afterworld from Taihhmushkullnn peak on the far southwestern edge of the Nilgiris, once summoned his daughter Taihhki(r)shy, who possessed divine powers, informing her that he had decided to establish an afterworld, where Todas would live after they had died. He asked Taihhki(r)shy to take charge of Imunawdr, the world of the living, since he would thereafter be in control of Amunawdr.

The god Aihhn then departed from this world to establish a new land for the dead. Men, buffaloes, and trees came to bid him farewell. On his way to locate this afterworld, Aihhn took a strange path. He climbed up a series of natural rock steps, cooked his food beside a stream inside a shola, rested on a grassy meadow, and touched his chest on a vertically-standing stone, which made him forget all worldly attachments. Finally, after a long trek across many natural obstacles, he reached the area where he would establish Amunawdr. Aihhn then decreed that all Todas who had properly observed the rites of passage would be eligible to enter his new realm by following the same route and passing the same natural landmarks as he had done. This edict established the third major connection with nature and geography in ancient times as it became mandatory to have performed all the rites of passage, which involve, inter alia, the use of scores of specified plant material.

For instance, just pregnancy and the associated paternity rites mandate the use of nine plant species, and since they occur in the night of the new moon, it is essential for every major hamlet to have them available in a nearby copse. At some higher-grade dairy-temples like at Konawsh, just priestly ordination requires the use of over 10 species. In a person's lifetime, there are over a hundred important plant species that are used in rites-of-passage, traditional architectural elements, and to gauge anxiety levels for different seasons, time of the day, and according to the person's age.

Secondly, since Aihhn proclaimed that all departing Toda spirits were to take the same route, crossing all the landmarks as he did enroute to the afterworld, all these formed a part of the sacred geography of the afterworld. Therefore, as long as Todas continue to believe in their afterworld—that remarkably does not lie in the heavens beyond, but right beyond the borders of their homeland—they will continue to perform all the rites of passage.

One of the first landmarks to be reached by a spirit travelling to the land of the dead is the sacred Kinat-thill(zh)y river, which spirits may cross only at specific points. Another landmark is Metthinny-ka(r)sh, with natural steps within a rocky dike running up its almost vertical face. The spirit must now climb these steps on its way to the afterworld.

I too have climbed these magnificent "god-made steps" (just as the spirit must do) and reached a massive charnockite rock with a natural band running across its width (like a tennis court boundary line). This rock is called Kocarr (Figure 3), after the ritual performed during a funeral ceremony in which every man who has married a woman from the deceased's patriclan, along with his wife, presents a *koc* (a kind of cloth) to the dead person. It is at this rock, Todas say, that the departing spirit hands over the *koc* to its relatives already in the afterworld, who are waiting on the other side of the natural band to receive it. Only after this presentation may the spirit cross the band and begin the second half of the journey to the afterworld. Again, it was amazing to see this rock, with the band running across it as a natural phenomenon.

Figure 3 - Kocarr: a charnockitic flat rock with a natural band across its width is encountered on the route to the Toda afterworld.

Towards the end of this fascinating journey, the spirit descends, shortly to reach a stream with a few sharp rocks standing on the slope above it. Behind one of these rocks lurks a large dog called *pehhreht-nawy* "the fighting dog". The *amutawll(zh)* "people-of-the-afterworld", are sitting and watching from the summit of a hillock just ahead. The spirit heads for Padrmakh-tehrr "the-swamp-below-the-slope-where-people-congregate", which is the next major landmark. When it arrives at this spot, the spirit must run rapidly across the stream ahead, lest the dog catch up with it. If the spirit, as a mortal, had committed incest by indulging in sexual relations within its own clan, Todas say the dog will catch and mount the spirit before it can reach the swamp. This is an unusual myth for a group whose deities, sacred names and toponyms are difficult to relate to broader themes, as Cerberus, the dog of Hades is a motif that recurs in many Indo-European cultures (Bloomfield 1905). The Rig Veda is no exception. In the tenth book, hymn 14 addresses the departing soul on its way to heaven: *Run past straightway the two four-eyed dogs, the spotted and the dark, the brood of Sarama; enter in among the propitious fathers who hold high feast with Yama*.

Geography in Song

The oldest category of Toda songs is called *pawtt*; to illustrate that many of these ancient compositions refer to their sacred geography, I present some translated couplets from *Kashwehh-vawtt*:

In the shola path called p-hill(zh)dz-vehll(zh)*, the sambhar deer has called / In the shola path called* seihhlly-vehll(zh)*, the Nilgiri langur has whooped //*

At the priest's path near the shola called pottawk-vehll(zh)*, the god* Aihhn's *Grey junglefowl has crowed. / At the hill* Awddokh *[above* Kashwehh *hamlet], the god* Aihhn's *birds have chirped //*

At the path called oof, the sacred calves are being allowed to suckle and are energetic /At the path called ne(r)shaadr *leading to the domestic stream at* Kashwehh*, the sacred buffalo calls out to its calf in the morning //*

How beautiful is the sacred lamp in the temple Aihhkyal(zh)f */ How beautiful are the sacred buffaloes within the pen* oofdwehh *//*

At the grassy slope pōlkabvem*, the men with beautiful voices are approaching this hamlet while chanting the* awsht *invocation / At the domestic stream* arrnel-gwehhdr*, the thumbs of the men approaching in procession are curved attractively //*

At the stream nel-gwehhdr*, the men have shaken off water from their beautiful crop of hair / At the brook* pottawk-kwehhdr*, the approaching men are shouting with joy //*

Blessed hamlet that has its feet in the lowlands / Sacred hamlet that has its hands in the hills //

Sacred place where leaves sprout from dry trees / Hallowed place where water springs forth from the rock [the sacred Ooneer spring] //

Sacred Geography of One Hamlet

I would like to present an example of the construct of the cultural landscape related to just one Toda hamlet, Nhyoollnn. If we want to obtain an idea of the aggregated sacred geography of the past, we need to amplify this example by around two-hundred-fold to cover extant and erstwhile hamlets, each having only a handful of inhabitants whose mundane lives were totally circumscribed by wild nature.

The panoramic view of Nhyoollnn (Figure 4) indicates the following landmarks (many of them chanted in the hamlet prayer) as follows:

1. Ordination waters (*neerkirsneer*) for priesthood
2. Dairy-temple stream (*kwehhdr-pupo(d)z*)
3. Route taken by approaching clansmen on migration day (they sprinkle water on themselves downstream of nos. 2 and 5)
4. Area where females wait at precincts on migration day
5. A sacred stream (*kwehhdr-vidhyof*)
6. Stone wall around the dairy-temple (*kattwehh*)
7. Temporary dairy-temple (*edhkonpoll(zh)y*) site
8. Dairy-temple of *poll(zh)y*-grade (*pōh-twarryall(zh)f*)
9. Buffalo pen (*twehh-mocod*)
10. Calf enclosure / shelter (*kadr-thill(zh)y-kadr*)
11. Milking ground
12. Buttermilk-pouring stone (*mo(d)zfattyp-ka(r)sh*)
13. Sacred stone (*eezh-ka(r)sh*)
14. Sacred stone (*ka(r)shy-keihhn*)
15. Sacred stone (*ka(r)sh-mocod*)
16. Sacred flat rocks (*teihhkh-arr, keihhn-arr, naa(r)sh-arrr*)
17. Buffalo pen gate-posts (*thill(zh)y-vidhyof*)
18. Sacred tree (*taihh-peh(r)shk*)
19. Sacred tree (*taihh-kwaddky*)
20. Sacred tree (*taihh-kehrrvizhky*)
21. Sacred tree (*paw(r)sh-pehzhky*)
22. Sacred pathway (*teih- kudd-dh*)
23. Ground and stream for saltwater-pouring rites (*arrkwehhdrkush-vall(zh)*); this site is located in the valley below the arrow mark
24. Sacred hill of ruling deity (*Kawnttaihh*)
25. Sacred hill (*P-hyooll(zh)dhy-kush*)
26. Sacred hillock (*Kodrawdhawll(zh)*)
27. Sacred hill (*Teihh-kwehhdrvem*)
28. Sacred hill (*Pōhkattaa(r)sh*)
29. Barrel-vaulted houses (*waadrthitty-aa(r)sh*)
30. Domestic stream (*aa(r)sh-neepahh*)
31. Site for churning secular milk (*paw(r)shkadrt-ehdrnn*).
32. Grassland (*yoorokh*)
33. Shola (*twaa(r)sh*)
34. Wetland (*tehrr*)
35. Acacia tree plantation

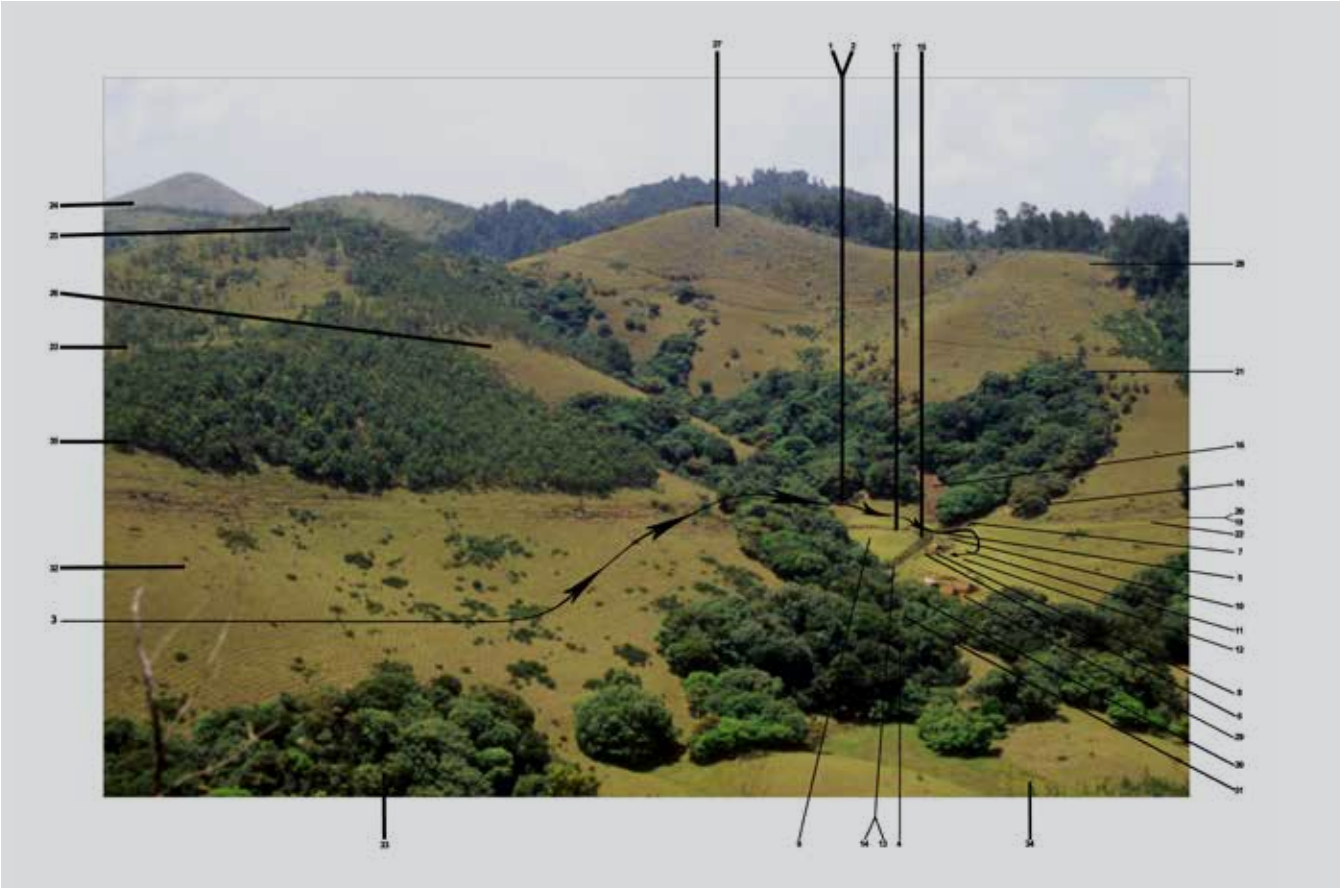


Figure 4 - Nhyooollnn hamlet panorama showing features of sacred geography (numbers correspond to details in the text).

Analysing the above panorama along with other sites that are not visible here, we can categorise the constituents of this hamlet's sacred geography into several sections:

Waters

1. Ordination waters for priesthood (*neer-kirs-neer*; mentioned in prayer: m.i.p.)
2. Dairy-temple stream (*kwehhdr-pupo(d)z*; m.i.p.)
3. Sacred stream and wetland (*kwehhdr-vidhyof*; m.i.p.)
4. Sacred stream for saltwater-pouring rites (*arr-kwehhdr-kush*)
5. Domestic stream (*aa(r)sh-neepahh*)
6. Sacred stream flowing down from Mount *Kudd.meihhn* (*taihh-neerodd.y*; m.i.p.)
7. Sacred deity river (*Kinatt-hill(zh)y*)
8. Sacred river (*Kwehll-kal-pahh*)
9. Pool nearby (*keeny-kaihhrr*)
10. Wetland nearby (*no(d)z-tehrr*)
11. Pool nearby (*kaihhrr-thill(zh)y*)
12. Stream in the vicinity (*kawn-kwehhdr*)

Pathways

1. Migratory route (♂)
2. Migratory route (♀)
3. Migratory route (priest-designate)
4. Sacred priestly pathway (*teihh-kudd-dh*; m.i.p.)
5. Route to saltwater-pouring site
6. Route to site for churning secular milk
7. Priestly pathway to buffalo pen (*kawllvōl*)
8. Priestly pathway to dairy-temple stream
9. Priestly route to milking ground
10. Priestly shola forest pathway (*teihhkh-vehll(zh)*; m.i.p.)

Stones

1. Sacred piled stone wall around temple (*kattwehh*)
2. Sacred piled stone wall around buffalo pen (*twehh-mocod*; m.i.p.)
3. Buttermilk-pouring stone (*mo(d)z-fattyp-ka(r)sh*)
4. Sacred stone calf pen (*kadr-thill(zh)y-kadr*; m.i.p.)
5. Sacred buffalo pen's stone gate-posts (*thill(zh)y-vidhyof*; m.i.p.)
6. Sacred rock on which priest ritually pours freshly-drawn milk (*ka(r)sh-eezh*; m.i.p.)
7. Sacred rock (small) located in buffalo pen (*ka(r)shy-keihhn*; m.i.p.)
8. Sacred rock lying in buffalo pen (*ka(r)sh-mocod*; m.i.p.)
9. Sacred flat rock (at ground level) behind buffalo pen (*teihhkh-arr*; m.i.p.)
10. Sacred vertical flat rock near the previous (*keihhn-arr*; m.i.p.)
11. Sacred vertical flat rock near the previous (*naa(r)sh-arr*; m.i.p.)
12. Sacred rock inside buffalo pen (*mawkhzh*; m.i.p.)
13. Rocky projections on Kawnttaihh hill that store: the mist (*keezhky-mehn*; m.i.p.)
14. Wind (*kwaw(r)shy-vōh*; m.i.p.)
15. Rain (*tee(r)shy-mudry*; m.i.p.)
16. Large, oval stone in temple courtyard that is lifted onto left shoulder as demonstration of strength by males (*tookit-ka(r)sh*)
17. "Head portion" of mythical snake-stone (*pōb-ka(r)sh*) seen nearby
18. Sacred stone walls of the temple dairy, especially the central stone slabs (*thill(zh)-cōh*)
19. A rock in the vicinity that is so sacred—it is listed as a deity hill (*Tehhkaihhny*)

Trees (various species)

1. Sacred rhododendron tree near temple (*taihh-peh(r)shk*; m.i.p.)
2. Sacred tree (*Syzygium caryophyllatum*) at hamlet precincts (*taihh-kwaddky*; m.i.p.)
3. Sacred tree (*Elaeocarpus glandulosus*) on a slope facing the dairy-temple entrance (*paw(r)sh-pehzhky*; m.i.p.)
4. Sacred tree (*Photinia integrifolia* var. *sublanceolata*) located near no.2 above (*taihh-kehrrvizhky*; m.i.p.)
5. Sacred tree (*Mahonia leschenaultii*) near temple (*twarry*; m.i.p.)
6. Sacred tree (*Michelia nilagirica*) near buffalo pen (*maw(r)sh*; m.i.p.)

Hills

1. Ruling deity hill (*Kawnttaihh*; m.i.p.);
2. Deity hill (*Kwatteihhn*)
3. Deity hill (*Teihhkosh*)
4. Deity hill (*Aihhzaihh*)
5. Deity hill (*Mōzaihh*)
6. Locally very sacred hill (*Kudd.meihhn*; m.i.p.)
7. Locally sacred hillock (*Kodrawdhawll(zh)*; m.i.p.)
8. Locally sacred hill (*Teihh-kwehhdrvem*; m.i.p.)
9. Locally sacred hill (*Pōh-kattaa(r)sh*; m.i.p.)
10. Nearby sacred hill (*P-hyooll(zh)dhy-kush*;)
11. Nearby sacred hill (*Taihhvōh*)
12. Nearby hill and slope (*Awrr-dhawll(zh)*)
13. Sacred hill in the vicinity (*Peihh(d)z-kawdr*)
14. Sacred hill (*Mudryn*)
15. Nearby hill nearby (*Ka(r)shnall(zh)f-tehtt.*)
16. Hill in the vicinity (*Teihh(d)z-kawdr*)
17. Nearby steep hillside (*kij-wehhry*)

Sholas (thickets)

1. *Kee(r)shy-twaa(r)sh*
2. *Paw(r)sh-vehzhky-kwarr*
3. *Weh(r)sh-eihhn-kwarr*

Open grounds

1. Open level ground nearby (*tehh-kawn-awdd*)
2. Site for churning secular milk (*paw(r)sh-kadrt-ehdrnn*)
3. Ground for saltwater-pouring rites (*arr-kwehhdr-kush-vall(zh)*)
4. Milking ground
5. Secular zone

At the outset, this hamlet's prayer couplet refers to the sacred landscape of the ruling deity as: *Kawneh(r)sh / Paangub //* mentioning the hallowed place of God Kawn who dwells in the nearby Kawnttaihh hill and whose influence extends all around, including this hamlet Nhyoollnn. As stated, even the temple lamp (*kwehhtyehd-pell(zh)k*; m.i.p.) is included in the sacred geography of the hamlet, being fuelled by clarified butter from buffaloes that graze in its domain. As an example of how Todas have traditionally managed their wilderness, I have dwelt on just one small hamlet, Nhyoollnn, where the sacred geography had been sanctified in ancient times by the deities, and consequently accorded protection by mortals.

A study of over 70 consecrated physical sites (of which 30 are m.i.p.) around this hamlet shows that a dozen of the sites are associated with water sources, many of which are mentioned in the prayer. Of these, there are locally sacred streams whose specified waters are required for temple, ritual, and utilitarian purposes. Since

this hamlet is occupied only during the drier summer months, it is imperative that water is available for sacred dairy churning, cooking, saltwater-pouring rites (Figure 5), etc. Thus, the Todas of yore used their ecological knowledge to ensure that vital hydrology conserving flora like the bladderworts (*Utricularia* spp.), the *poll(zh)-awll(zh)-e(r)sh* (*Pleiocraterium verticillaris*), an endemic herb that holds "jugs" of water in the midst of a rosette of large vertical leaves (Figure 6), along with other species that have complex subterranean sponge-like effect are protected and allowed to flourish around water sources. It is due to such plants that the western Upper Nilgiris has the distinction of being a rare ecosystem where precipitation and groundwater runoff levels are similar. These waters are also used at the seasonal saltwater-pouring ceremonies—the one in summer is an indirect method of wilderness management that appeals and prays for bountiful rains during the impending southwest monsoon as well as for general and ecological benediction (Figure 7).

Figure 5 - Saltwater pouring rites are a seasonal prayer for ecological wellbeing.

Figure 6 - *Pleiocraterium verticillaris*, a sacred endemic hydrology conserving herb that holds water within its rosette of vertical leaves.

Figure 7 - Praying for ecological and general benediction at the saltwater pouring rites.

During their annual sojourn at Nhyoollnn, the residents rely on specified plants for their mundane and sanctified existence, all of which are sourced from the surrounding wilderness that is central to the sacred geography of this tiny hamlet. I have enumerated around 23 species that were used in 2012, including those specified species permitted to be used as firewood, and separate shrubs utilised for sacred and secular sweeping, firesticks, and as architectural elements. Some of these species, like the bark of the *tehhdr* tree used to purify the temple and sacred streams, are so sacred that they can only be handled by the priest, and no layperson may do so. Since this hamlet was once the site of the most sacred *tee*-dairy, regular rites of passage entailing the use of several specific plants are disallowed along with the prohibition of the occurrence of childbirth and death (i.e., if these ceremonies had been permitted, numerous other plants would have been used). In addition, there are six holy trees within the hamlet that are mentioned in the hamlet prayer by the priest and thus revered. Such plants are often sanctified, since they are not only growing in the hallowed landscape, but sometimes not to be used for mundane purposes, thus being integral components of their cultural geography.

This listing mentions 17 hills of varying sanctity grades in the vicinity—from the ruling deity, other deity hills, locally very sacred hills, to those of restricted importance; many are mentioned in the hamlet prayer. The Toda lexicon has a number of commonly used terminology for hills, slopes, summits that may be suffixed to actual prayer names of hills e.g., *aatott., artawll(zh), edhkwehll(zh)ynawdr, eetott., kadrta(r)sh-voy, kavfy, kep, kofoy, koott., kotvoy, kōyvoy, kuddy, kush* (*P-hyooll(zh)dhy-kush*; no. 25 in fig. 4)*, kwehhtt, maa(r)sh, ma(r)shawdr, magehl, makh, mehn, mudry, muknawdr, nodrdawll(zh), odd., ott., paihhrr, p/vall(zh)* (*arrkwehhdrkush-vall(zh)* no. 23 in Figure 4)*, pann, pehn, pem/bem/vem* (*Teihh-kwehhdrvem*; no. 27 in Figure 4)*, pett.-tehtt., ta(rsh-aarr, tawll(zh)/dawll(zh)* (*Kodrawdhawll(zh)*; no. 26 in Figure 4)*, tehnnp, tehtt., tōhvoy-nawdr, wehhry* (*kij-wehhry*; no. 17 in Figure 4 indicative of their inextricable link with sacred geographical features. It is noteworthy that the sanctity and protection accorded to Toda mountains also extend to myriad other ecotypes, being constituents of that hilly landscape.

Also, while Todas regard their deity Kwatteihhn as residing in his pinnacle, that same peak is worshipped by another Indigenous People, the Kurumbas (who reside at the foothill) as the abode of Lord Shiva, thus known as Malleswaran Mala. Therefore, when Todas pilgrimage to either Kwatteihhn or Kawnttaihh summits they are also inadvertently contacting a larger Indic context that has its own sacred geography (Eck 2012). It is mentioned by tribes across India that Lord Shiva and Goddess Parvati once took on a tribal incarnation of Kirata and Vanadevi, whose son is identified as a god by some tribes. This son was known for playing pranks that disturbed all the gods, but was finally accepted by them as one with divine powers. It is remarkable that another Toda deity, Kwattaihh, also disturbed the gods with his antics, and when challenged to turn daylight into temporary darkness and to make a stream flow backwards, he achieved both tasks—the physical landmarks can still be seen—and thus was finally accepted as one among them.

It is believed that Kwattaihh disappeared in the Mitoor area and although he resides at many places, his main dwelling site is said to be at Pettkon, commonly known as Vettaikorumagan ("hunter's son") temple on the outskirts of Gudalur. This deity is also known as Kirata-Sunu ("son of hunter Kirata"), who is none other than the tribal son of Lord Shiva. Although the Todas do not make this connection, it is pertinent to note these similarities indicating the possibility of an ancient link with a wider, sacred geography that became dimmed by residing at the Nilgiris highlands for millennia.

A Live Landscape

There are several stories, both from ancient and recent times, concerning the power of a specific hill god. One well-known recent story, relates to the construction of the hydroelectric dam at Upper Bhavani near Nhyoolln hamlet. During the building process, workers started digging earth to be used for the construction work from the nearby deity hills of Aihhzaihh and Mōzaihh. Some Toda elders, committed to their sacred hills, protested at this sacrilege, but their words went unheeded. After a while, news came that, during the digging work, the earth had caved in and killed some of the labourers. Subsequently these hills were left untouched.

Emphasising the belief that the gods reside *inside* the hills, Todas relate stories of how they have heard sounds of the resident god entering his or her hill and closing the entrance behind. At Kawllvoy, one can see a door-like entrance on the cliff-face of this hill (Figure 8). Similarly, at Awllvoy, a door-like feature can be seen in the rocks. Kawllvoy and Awllvoy, are siblings—elder sister and younger brother, respectively. Awllvoy uses a subterranean passage to reach his sister's abode and interestingly, although these sites are far apart, they lie on a straight northeast–southwest axis, attesting to instinctive geographical acumen of Todas.

Figure 8 - Door-like feature on cliff-face of deity hill Kawllvoy.

Indian epics often mention the seven sacred rivers; the seven cities of liberation; seven sacred mountains, and the seven seers. Although the Todas have no such parallel, it might be worth investigating why the number seven too recurs in Toda localised contexts—indeed, this number is often used to indicate the term "many", thus seven sacred lamps mentioned in a song indicates manifold sources of divine light.

Every Toda prayer mentions specific rocks by their sacred names, and some have rituals performed on them, or are related to mythic events. So, we have "snake stones" representing the three portions of the reptiles' anatomy—incidentally, the "head" portion of this is found in the vicinity of Nhyoollnn hamlet. There is a "robber stone" that is believed to turn over in the darkness of new moon nights—a belief that is held by even modern settlers living nearby. Then there is a corpse rock resembling a female body, believed to be the petrified body of a woman who died in a hamlet where death is forbidden. There is a barrel-vaulted rock known as the "dairy-temple stone" (Figure 9), so hallowed that one has to walk barefoot towards it. The list of such natural phenomena with an associated mythology is numerous. Another example is the adjacently-located stones at Nehdry clan's male funeral site, Aaki(r)shykawdry, which, when hit, progressively ring to the classical Indian musical scale.

Figure 9 - Barrel-vaulted "dairy-temple stone".

Every occupied hamlet has distinct domestic and sacred areas, with a special stone demarcating the two. From such examples, we see that seemingly inanimate objects like rocks that dot the Toda landscape are endowed with sanctity, anthropomorphism, mythology, and even the magical ability to shift their positions, thus providing a different facet of sacred geography. In the list above, we see that 19 rocks are considered important for just one hamlet, of which, 13 are mentioned in its prayer.

Conclusions

Todas learn several regulations related to their sacred environment from an early age. For instance, there may be a sacred flat rock at ground level along the regular path to the hamlet that people must scrupulously avoid treading upon daily. There are other pathways they know that only a priest may traverse. They come to understand that some waters are reserved for dairy-temple related use only by the officiating dairyman priest, others for the ordination rites of a priest-elect, some for collecting water specifically for the salt-pouring rites that occur periodically for the buffaloes, and yet others for cooking festive food during temple related ceremonies. They discover that some plant species can only be handled by a dairyman-priest associated with a corresponding temple grade, while others are meant only for certain sacred rituals. They know that after incurring the polluting effects associated with a funeral, they must not venture towards any sacred area in that landscape. They are told that some peaks are the abodes of gods who are the deities of their clan and that they must adopt the unique *koymukht* posture and salute them with reverence. They realise that the sacred rivers must be treated with respect and should only be crossed in a state of ritual purity.

Figure 10 - Dairyman-priest sprinkling milk on the eezh-ka(r)sh rock at Nhyoollnn.

Even before becoming a dairyman-priest, a person is informed of the rules and regulations associated with that particular grade of temple. He knows the specified thorny species that an ordinand must collect on the day he becomes a priest, along with the bark of an exceptionally sacred tree that no lay Toda is allowed to handle. He has observed that fire is to be made only by friction, using the sticks of another sacred tree (*keihh(d)z*), and this is used to light the temple lamp. When he partakes of his sacred fare around the temple complex, specific leaf plates and a bamboo vessel are to be used. There might be a specific sacred rock in the vicinity on which the dairyman has to pour freshly-drawn sacred milk (Figure 10). The list goes on. At every level, the connection and identification with sacred geography is inseparable for a Toda, and from such examples, we understand that both secular and sacred Toda lives are circumscribed by Nature on a daily basis and not the other way around as we are trained to believe.

This model of using their sanctified cultural landscape as a method of stewarding the surrounding wilderness needs to be emulated globally. It is no coincidence that the Nilgiri Biosphere Reserve, of which the Toda heartland forms the core area, was selected in 1986 to be the first such reserve in all of India, under UNESCO's Man and Biosphere programme. This is a fine testimony to the management policies followed by all the Indigenous groups dwelling here since millennia, each contributing to its rich bio-cultural diversity.

The Todas' pastoral way of life, combined with their non-martial, non-hunting, pacifist and vegetarian lifestyle has surely played a significant role in ensuring the survival and prospering of the biodiversity surrounding their settlements. Even today, Todas meet with introspection, rather than a desire for revenge, the loss of a buffalo to a predatory resident tiger. Extraordinarily, they are able to accept their loss as a benediction.

When a Toda looks at certain hills, he sees them as the abodes of deities whose names he has chanted while serving as a dairyman-priest. Indeed, when he looks at many a rock, or rock formation, tree or body of water, he sees them as emanations of divinity, integral parts of the sacred geography of his hamlet, clan and community (Figure 11).

Figure 11 - Sacred flat rock edhkwehly-ka(r)sh.

Values embedded in the Toda psyche ensure that some waters are so sacred that a priest alone may touch them; certain rocks so hallowed that even the most modern of Todas would never dream of treading upon them; and some plants so holy that only an ordained priest may handle them. A low population structure (1,500 people) has enabled the Toda People to be just one simple link in the web of life. As I have mentioned in the WILD12, Hé Sapa Declaration on Sovereignty and Wilderness: Deepening the Wilderness Concept Through Indigenous Knowledge and Wisdom (2024)—"Yes, there are specific Sacred Areas, and they exist within a [Toda] Sacred Geography".

The aim here is not only to use the Toda model of true stewardship of wilderness (rather than a sterile concept that excludes humans) for use in modern global settings, but also an appeal to the Indian Government to once again make the Todas partners in managing this pristine area. After all, if the Indigenous People of the Nilgiris had not managed this area in an exemplary manner, the many National Parks, Tiger Reserves or indeed, even the Nilgiri Biosphere Reserve would not exist.

References

Blavatsky, H.P. 1930. The people of the Blue Mountains. Wheaton, IL: Theosophical Press.

Bloomfield, M. 1905. Cerberus, the dog of Hades. Chicago, IL: Open Court Publishing Co.

Chhabra, T. 2015. The Toda landscape: Explorations in cultural ecology. Harvard Oriental Series vol.79. Harvard, MA: Harvard University Press.

Eck D.L. 2012. India: A sacred geography. New York: Three Rivers Press.

Emeneau, M.B. 1974. Ritual structure and language structure of the Todas. Philadelphia , PA: American Philosophical Society.

Hé Sapa Declaration 1. 2024. The 12th World Wilderness Congress. https://wild.org/wild12/resolutions/on-sovereignty-and-wilderness-deepening-the-wilderness-concept-through-indigenous-knowedge-and-wisdom/ [Accessed September 1 2025].

Venkata Ramanayya, N. 2007 (1930). An essay on the origin of the South Indian temple. New Delhi: Asian Educational Services.

Section 2

Rewilding, Values, Meanings, and Relevance of Wilderness

From Wilderness to Rewilding:
Defending the "Will-of-the-land" in the 21st Century

BY LINDE DE VROEY and ARTHUR OBST

Introduction: Four Decades of Wilderness

In October 1983, the 3rd World Wilderness Congress took place in Findhorn, a small eco-village surrounded by pine woods, white sandy beaches, and wind-swept dunes on the northeastern coast of Scotland. Here, for an audience of Scottish and international conservationists, scholars and activists, the Indigenous American philosopher Jay Hansford C. Vest introduced an idea that would rapidly captivate environmentalists' imaginations on both sides of the Atlantic. In his presentation, Vest (re)defined wilderness as "self-willed-land"— an idea he traced back to the "indigenous" European cultures of pre-Roman times. He would later publish this idea as an academic article (Vest 1985). This modest, little-known text would become one of the foundational philosophical pieces for 20th century wilderness conservation and its new offspring, *rewilding:* "the scientific argument for restoring large wilderness" based on "self-sustaining natural processes" and a new recognition of nature's autonomy (Soulé and Noss 1998; Foreman 2004; Carver et al. 2021).

Wilderness, according to Vest, means "will-of-the-land" or "self-willed-land" "with an emphasis upon its own intrinsic volition". The "will" in this description, he argues, opposes the controlled and ordered environments characteristic of modern civilization. In Vest's words, "while control, order, domination and management are true of civilization and domestication, they are not essentials of primal culture. The primal peoples of northern Europe were not bent upon dominating and controlling all environments" (Vest 1985: 324). Up until today, this description offers one of the most poignant pictures of wilderness, captivating the spirit of the wilderness movement. Critically, however, this definition does *not* exclude human presence from the wilderness, nor does it negate human–nature relationships. On the contrary, wilderness or "will-of-the-land", for Vest, expresses a *particular* type of human–nature relationship, in sharp contrast to the modern Western conception of land as a recourse or a commodity: "a recognition of land in and for itself." This is an essential point, to which we will return in the section *Rewilding: from wilderness to wildness*.

We, the authors of this piece—an American working on wilderness philosophy in the United States, and a Belgian working on rewilding philosophy in Europe—were not yet born when Vest presented his idea that autumn day in the Findhorn community. We accidentally stumbled across this story and its enduring influence some forty years later, driving through the vast, otherworldly landscapes of Utah. In Vest, we suddenly saw a clear connection between threads of *wild* thought on both our home continents, and we were captivated by the idea of self-

***Linde De Vroey** is a Senior Researcher at the Department of Philosophy, University of Antwerp. ORCID: 0000-0001-9192-7730. Email: linde.devroey@uantwerpen.be. Arthur Obst is a Postdoctoral Associate at the Climate Systems Engineering initiative at the University of Chicago. ORCID: 0000-0002-0616-4132. Email: arthurobst03@gmail.com*

willed land, by the lasting influence in wilderness and rewilding thinking today, and by Vest's connection to the World Wilderness Congresses and to the small village of Findhorn that later would inspire rewilding in Scotland. Most of all, we encountered a profound message of transatlantic entanglement and cross-cultural meaning, which strikes us as still acutely relevant today.

Like everyone in our generation, we were born in an increasingly wounded world, a world every day more depleted of intact natural communities, diverse living environments, and sovereign wilderness. Today, the tangible, living wilderness and *wildness* of the world—the web of life that, allowed to thrive freely, sustains our planet as we know it—is under attack. But so is the *idea* of wild(er)ness itself. This concerns us deeply. We do recognize the great importance of revisiting certain histories and interpretations of wilderness and wildness, particularly from decolonial and Indigenous perspectives, as has been done recently in and outside academics. In history, the idea of wilderness has been weaponized to seize land from people, and so it might again. Yet, we are also worried about a current tendency—especially in some academic fields—to univocally reject concepts that have been, and still may be, uniquely valuable in many contexts. We are concerned that, in discarding wild(er) ness altogether, something unique and valuable will get lost—perhaps irreversibly.

At stake is an idea with a strong motivational and imaginative power that stands as one of the last bulwarks against the growing lure of imagining the whole earth to be controlled, dominated or "managed" by humans. This last idea strikes us as profoundly arrogant. The true meaning of wilderness, we think, can be found in an ethos that radically opposes such human exceptionalism by drawing attention back from the will of humans to the "will-of-the-land". This is a meaning with a critical capacity and a *liberatory* ethos. It is capable of dismantling not only mainstream systems of endless economic growth, but also stands opposed in principle to the chauvinism of the colonial mind, which seeks domination by devaluing that which is different. In what follows, we dwell on this historical meaning of wilderness, what it has meant for the movement, and its enduring value today.

Self-Willed Land: the Meaning(s) of Wilderness

Vest's account provides a valuable starting point for retracing and retrieving this liberatory meaning of wilderness in a new and contemporary practice like rewilding. To make our argument, we should therefore return to the 3rd World Wilderness Congress. Among the members of Vest's audience in Findhorn was Dave Foreman, an environmental activist from New Mexico and founder of the radical environmental activist group *Earth First!* A life-long defender of wilderness, Foreman would make his significant mark on wilderness conservation and the later rewilding movement. One day, in the fall of 1992, while driving through the extensively plowed and poisoned expanse of land in North Dakota known as the Great Plains, Foreman noticed a profound world of wounds all around him. Yet, that same evening while camping in Theodore Roosevelt National Park, he was struck by the resurgence of wildness around him. The bison, elk, and pronghorn, extirpated at the park's formation, had now returned. Knowing that he had his quarterly *Around the Campfire* address due to the readers of *Wild Earth*—the journal of the newly formed Wildlands Project—he jotted down a phrase that would come to enliven and enrapture the conservation movement: "It is time to rewild North America; it is past time to reweave the full fabric of life on our continent" (Foreman 1992).

Foreman is often accredited with "coining" the term rewilding in this column, though in reality he probably borrowed the word from environmental activist circles, where the term has been part of the discourse since the early 1980s (Pike 2019; Fisher and Carver 2023). But Foreman endowed the concept of rewilding with a particular *wilderness* vision, aligned with the conservation efforts of the Wildlands Project. Referring to the inspirational moment of Vest's presentation in Findhorn, Foreman wrote in 2000 that the "self-willed land meaning of wilderness overshadows all others", adding that wilderness essentially denotes a place "beyond human control" (Foreman 2000: 33).

Foreman's vision was introduced into the scientific academy in 1998 by his colleagues Michael Soulé and Reed Noss, in a now iconic paper where they define rewilding as "the scientific argument for restoring big *wilderness* based on the regulatory role of large predators" (Soulé and Noss 1998). They also provided the scientific translation for the philosophical concept of "self-willed land," in stating rewilding's central goal as "restoring self-regulating land communities". Then, in 2021, a group of 33 rewilding scientists and practitioners from around the world (Foreman, Soulé, and Noss amongst them) commissioned by the IUCN recovered this original meaning in their statement that "(r)ewilded ecosystems should—where possible—be self-sustaining" (Carver et al. 2021: 1888). In contrast to Soulé and Noss's original paper, however, the word "wilderness" was banished from rewilding's definition. On the surface, then, it may seem that rewilding has rejected wilderness.

Rewilding: from Wilderness to Wildness

Let's take a step back to see how this happened, returning to rewilding's near-mythical origins in a *Wild Earth* column, penned by a man who above all defended *wilderness*. Even as it provided the movement's original momentum, rewilding's close association with wilderness—and with its infamous "warrior" Dave Foreman—could be seen as a curse when, in the decades to follow, both wilderness and Foreman became the target of several (not always unjustified) philosophical attacks. Foreman received severe pushback for his increasingly social-conservative positions. Foreshadowing such controversies, prominent critiques of the wilderness conservation movement and the concept of wilderness itself significantly gained traction in the 1990s by calling attention to the wilderness movement's limited concern for social and environmental justice. Initiated by Indian decolonial scholar Ramachandra Guha (1989) and lifted into the philosophical canon by Baird Callicott (1991) two years later, the attack on the wilderness idea hit a crescendo in 1995 with the environmental historian William Cronon's famous *New York Times'* piece *The Trouble with Wilderness*. Cronon's point was mercilessly clear: as a colonial, ahistorical and dualistic concept, wilderness is not just fraught but is also dangerous, posing "a serious threat to responsible environmentalism at the end of the twentieth century" (Cronon 1995). Despite severe pushback at first, the "problems with wilderness" have since become ubiquitously accepted in environmental thought.

And yet, William Cronon, as well as many other wilderness critics who would follow, leaves the door open for wilderness' little cousin: *wildness*. For wildness—the kind we find in our backyards, in our homes, and even in the midst of our own domesticated lives—can teach us to think about nature in a non-dualistic way. Through wildness, we can perceive that wild nature is not just "out there", in an unpeopled wilderness, but also "in here", as the "autonomy of the other" that is not ourselves (Cronon 1995). Cronon makes a strong case for a non-dualistic wildness, which can be cherished in the heart of domesticated life. In the new millennium, environmental thinkers increasingly argued that it is important to recognize that there is "wildness" everywhere. This was even true of human artifacts, because nature—whether a mountain or a mall—will always exceed our attempts to

control it (Vogel 2003; 2015). In this way, wildness will manifest at the margins of even the most human-dominated environments. This possibility would later be embraced by rewilding advocates, for their new movement—which took flight in Europe in the new millennium—could not escape the critiques that eroded the legitimacy of the wilderness movement from which it was born. Therefore, the trajectory of the rewilding movement (at least up until now) was shaped by a sensitivity to these criticisms, carefully avoiding the wilderness discourse.

The British journalist George Monbiot, a passionate rewilding advocate and arguably one of the most influential voices in inciting enthusiasm for rewilding in the UK and the rest of Europe, inadvertently provides a perfect case-in-point. In his bestseller *Feral*, Monbiot describes rewilding's main goals as follows: "the ecosystems that result [from rewilding] are best described *not as wilderness*, but as *self-willed*: governed not by human management but by their own processes. Rewilding has no end points, no view about what a 'right' ecosystem or a 'right' assemblage of species looks like. (...) It lets nature decide." (Monbiot 2013: 10). This should sound familiar. Ironically, the "self-willed" that Monbiot invokes to redeem and define rewilding is none other than the idea Vest used to redeem and define *wilderness* and adapted for rewilding by Dave Foreman.

Why Monbiot's bizarre move? Because one suggested and tested way to escape the dichotomies levelled by the wilderness critiques has simply been to follow Cronon, and replace the concept of wilderness altogether by the less ideologically charged concept of "wildness". *Wildness*, in this view, primarily stresses nature's self-governance and evades the old nature–culture dualism, for it doesn't require an "unpeopled wilderness". Notably, prominent rewilding organizations in Europe readily adopted this approach—perhaps not as much in response to the colonial critiques as to the dualistic critiques and local stakeholder's negative associations with wilderness as an unproductive, unpeopled place—to the extent that European rewilding is now considered by some as a totally distinct approach (Corlett 2016; Ward 2019). Like Monbiot, European rewilding has distanced itself at least formally from rewilding's North American origins.

But all this has resulted in a strange paradox. Wilderness was replaced by a concept of wildness that means *exactly the same thing* as the "wilderness" idea that gave birth to the rewilding movement in North America: an idea that stressed the "self-willed" character of nature, *free from human domination and control*— nature's autonomy, as it was articulated by Vest. Thus, Cronon's and others' "solution" to move away from the dualistic and colonial aspects of the wilderness idea appears to be merely rhetorical: the language (just slightly) changes, but in effect, the conceptual content remains the same.

Defending the Wild: the Liberatory Meaning of Wilderness

In our view, there are two reasonable paths to take from here on. The first is to endorse the dualistic, colonial and anti-humanist critiques on wilderness, and move on from *all* "wild concepts", including wildness and rewilding. The second is to explore the conditions and possibilities to transfer a *liberatory* meaning to rewilding that has long existed in the wilderness tradition even while keeping the importance of such criticisms in mind. We choose the second route, but we will first acknowledge the validity of the first stance before explaining our reasons for rejecting it.

The Indigenous philosopher Kyle Whyte (2024) emphasizes the entanglement of *all* "wild concepts"—*wilderness*, *wildness*, *the wild*, and one could add *rewilding*—with a colonial history of dispossession. Wild concepts, he argues, historically played a role in colonization in the US and elsewhere, and have been used as a

rhetorical tool to "denigrate indigenous peoples' land management practices, land tenure systems, science and knowledge systems, and political sovereignty and self-government" (p.74). This critique, grounded in Indigenous worldviews and historical realities, points towards the important fact that one cannot just separate "wilderness" from other wild concepts—and thus cannot brand one side of the division "colonial" or "dualist" and the other not. We grant the importance of this point. The historical injustices to Indigenous people, carried out under the cover of wilderness *or* wildness, should be kept in mind for *all* wild concepts. But while we fully agree on Whyte's points that all wild concepts are related, and have historically played a role in oppression, we do not agree with his central claim that wildness therefore entirely "should be *discarded* as a term or concept" (p. 82, emphasis added).

Whyte's argument overlooks the heterogeneity and ambiguity in wild concepts. It reduces these concepts to just *one* set of meanings—and, to our understanding, not its (historically) most prominent and certainly not its most influential today. The history of the worldwide wild(er)ness protection and later rewilding movements does not only present us with a narrative of colonial abuse, but also with a story of the successful protection of wild nature against industrial development. This is a story of preventing the destruction of forests, avoiding the death of thousands of animals, or even halting the extinction of species. Wild(er)ness, then, does not only represent a history of colonialism, but also tells a story of the love, care and courage of millions of people who defended their land, environment and culture against the destructive forces of extractivism. Whyte's argument that wild concepts do not add anything to the conversation, overlooks this particular side of the story: the *liberatory* meaning long attached to wild(er)ness, which protects the wildness of nature just as it protects the freedom of humans, and ultimately opposes *all* forms of domination—including colonialism. In this narrative, wild concepts, stressing the self-willed character of land "in and for itself", provided and continue to provide a powerful motivational force for the protection of nature in (Western) history and culture. While it is true that many Indigenous Peoples express(ed) these sort of relations with the land in different terms (Whyte 2024); especially within Western culture, wild(er)ness and rewilding have become important ideas that help people value nature and reconnect with their environment through stressing the fullness, autonomy, and *meaning* of the world beyond anthropocentric (human-centered) values.

In this way, wildness need not be opposed to people if people do not fundamentally oppose—suppress, exploit or destroy—wildness. To put this idea more precisely: the antonym of the wild—the artificial—involves impeding the self-expression of the natural world by making nature conform to one's own will. When humans artificialize at scale, bulldozing entire ecosystems and erecting their own environments designed by themselves, they dominate and disvalue nature. This is a refusal to "let be" in near entirety. Regrettably, the pursuit of such total human mastery over nature still seems to be status quo today, particularly in the West. In this hegemonic culture, the recognition of the "will-of-the-land" acts as a reminder that not the whole Earth belongs to us (a thought that is common sense in most Indigenous and non-Western cultures). It is in this last sense that wilderness acquires an explicitly *liberatory* meaning: a chance to act against the hegemonic forces of a worldview and a civilization which ultimately does not shy away from exploiting or even annihilating both other cultures and wilderness.

Recognizing the self-willed character of all (non-)human beings and places, however, does not exclude human presence, intervention or relationships. But it consecrates certain places as land where humans should step especially lightly, where intervention should be minimal, and where "the will of the land" is allowed full expression. Therefore, we need wilderness as much as wildness, because wildness is not just a place-less, abstract concept. Wildness needs *space*, and a *place* to thrive. Such places have historically existed for, and such relationships have been practiced by, countless individuals and traditions—including many Indigenous cultures. Humans may well live in the wilderness, if they let the wilderness live.

This is perhaps the most important reason why we need wilderness: as a place—both real and as an imaginary horizon—from which to question and criticize the assumptions, forces and relationships that shape our everyday lives. The wilderness has long been a place where the imagination has thrived, for better or worse (for who can put limits to the imagination?)—the colonial imagination, the aristocratic imagination, but equally the artistic imagination, the refugee's imagination, the imaginations of the outlawed, the banished and the oppressed, the enchanted imagination, and perhaps most of all the critical, liberatory imagination. Wild places have provided humans with a chance to rethink our societies and our relationships with the natural world, with the gods, and with each other. Meanwhile, they have been a sanctuary for numerous other beings who were no longer part of the imaginaries humans created for other places. Wildernesses protect us from the creeping memory-loss that comes with the loss of healthy ecosystems and the cultures dependent on those ecosystems—among scientists better known as the *shifting baseline syndrome*—and which affects the collective imagination. They are places where not only species, but also memories, can be preserved and where new relationships can be forged.

Perhaps most of all, wilderness today can be a counter-image of the idea that *humans* control, manage and dominate the entire world. It stands in sharp contrast with the idea of the Anthropocene— a geological epoch defined by human domination—where one is invited to see a world created by and comprised of human actions. The existence of wilderness shows us that such a world is as much a fiction as the most "pristine", untouched wilderness that the critics attack. The moral ideal of the "self-willed land", however, testifies to its very right to exist— puncturing arrogant illusions and replacing dreams of domination with attitudes of healthy humility and co-existence.

Upshot: A Way Forward for Wilderness

It has been 42 years since the 3rd Wilderness Congress, but the success of nine subsequent conferences, the steady growth of the Wild Foundation, and the rapid expansion of the newly formed rewilding movement all over the world testify to the continued appeal of wilderness and its related "wild concepts". Efforts to preserve and restore the wild are far from perfect, and there is still much work to be done to decolonize and democratize the movement. But abandoning wild concepts and changing the words for newer terms will not do the work. In the end, this linguistic move might turn out to be counter-productive and perhaps even dangerous, obscuring ongoing injustices towards people and environment that survive shifting semantics. Rather, we propose aiming for a continued expansion and revision of our understanding of the liberatory meaning and potential of wild ideas. The "self-willed land" meaning, which emphasizes the wild as a place of freedom and self-expression for both humans and nonhuman nature, is one interpretation that may remind us of the critical value of wilderness in confusing times.

In the summer of 2024, we were honored to make the case for wilderness to the audience of the 12th World Wilderness Congress in *He Sápa*, the Black Hills, the sacred territory of the Oceti Sakowin or Lakota People. Despite all gathering under a banner of wilderness, the concept was open for critique and redefinition, sparking passionate discussions in both the sessions and hallways. Clearly, wilderness still has its fierce defenders in some circles. In our philosophical academic environment, however, the overwhelming consensus seems to be that wilderness is a thoroughly debunked idea. Perhaps these different contexts make a big difference in the way wilderness and wild concepts should be approached.

In some contexts, the default inclination may have been an excessive attachment to an outdated wilderness idea. In our present context, however, we identify the default as an equally dangerous attack on wilderness and wild concepts, in which wilderness has no place in conservation—or the world. Our aim is to defend wilderness against this last sort of overblown attacks, to balance out some of the (what we see as) exaggerations by well-meaning colleagues. A metaphor by Aristotle may be helpful here. The Ancient Greek philosopher once compared virtuous human behavior to the physics of bent sticks: a stick must bend all the way in the opposite direction before it will straighten out. Likewise, if one is trying to hit the "virtuous middle" between extremes, it is often appropriate to *lean against* the default inclination. In our defense of wilderness, we aim to straighten out the stick once again.

We affirm then that context matters. "Wilderness" and "wild", we grant, are Western concepts, forged within a Northwestern European framework and exported to the rest of the world through the English language. We are not suggesting forcibly imposing these concepts on other cultures and peoples; least of which Indigenous Peoples. However, *within* Western societies (and perhaps even for Indigenous cultures situated within economic, political and legal structures shaped by the West), wilderness can be a valuable alternative for the hegemonic ideologies of industrial capitalism and neoliberalism. In addition—as examples such as the Mission Mountains Tribal Wilderness in Montana indicates—wilderness can provide for all people a powerful legal tool for stopping environmental and socio-cultural destruction.

Ultimately, our most substantive claim is that conservation, and rewilding, still have room for wilderness. The conservation biologists Michael Soulé and Reed Noss once wrote that "(t)he greatest impediment to rewilding is an unwillingness to imagine it" (Soulé and Noss 1998: 247). The same can be said about wilderness—what we call the places where wildness can freely thrive. We worry that entirely discarding wilderness, or rewilding, will severely cripple the imagination. This would perhaps be the greatest threat to responsible environmentalism in the 21st century.

References

Callicott, J.B. 1991. The wilderness idea revisited: the sustainable development alternative. In: Callicott; J.B.; Nelson, M.P., eds. The great new wilderness debate. Athens, GA: University of Georgia Press.

Carver, S.; Convery, I.; Hawkins, S. [et al.]. 2021. Guiding principles for rewilding. Conservation Biology. 35(6): 1882–1893. https://doi.org/10.1111/cobi.13730

Corlett, R.T. 2016. Restoration, reintroduction, and rewilding in a changing world. Trends in Ecology & Evolution. 31(6): 453–462. doi:10.1016/j.tree.2016.02.017

Cronon, W. 1995. The trouble with wilderness. New York Times. 13 August. https://www.nytimes.com/1995/08/13/magazine/the-trouble-with-wilderness.html.

De Vroey, L.; Obst, A. 2025. Wilderness values in rewilding: transatlantic perspectives. Environmental Values. 34(3). doi:10.1177/09632719241305719

Fisher, M.; Carver, S. 2023. The emergence of rewilding in North America. In: Hawkins, S.; Convery, I.; Carver, S.; [et al.], eds. Routledge handbook of rewilding. London: Routledge.

Foreman, D. 1992. Around the campfire. Wild Earth. 2(3). http://www.environmentandsociety.org/node/5682

Foreman, D. 2000. The real wilderness idea. In: Cole, D.N.; McCool, S.F.; Freimund, W.A.; O'Loughlin, J., comps. 2000. Wilderness science in a time of change conference-Volume 1: Changing perspectives and future directions; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 32–38. https://www.fs.usda.gov/research/treesearch/21894

Foreman, D. 2004. Rewilding North America: a vision for conservation in the 21st century. Washington, D.C.: Island Press.

Foreman, D.; Carroll, L. 2014. Man swarm: how overpopulation is killing the wild world. Live True Books.

Guha, R. 1989. Radical American environmentalism and wilderness preservation: A third world critique. Environmental Ethics. 11(1): 71–83. https://doi.org/10.5840/enviroethics198911123

Jørgensen, D. 2015. Rethinking rewilding. Geoforum. 65: 482–488.

Marris, E. 2013. Rambunctious garden: Saving nature in a post-wild world. London: Bloomsbury Press.

Monbiot, G. 2013. Feral: Rewilding the land, the sea, and human life. Chicago, IL: University of Chicago Press.

Oelschlaeger, M. 1993. The idea of wilderness: From prehistory to the age of ecology. New Haven, CT: Yale University Press.

Pauly, D. 1995. Anecdotes and the shifting baseline syndrome of fisheries. Trends in Ecology & Evolution. 10.

Pike, S.M. 2019. "Wild nature" and the lure of the past: the legacy of romanticism among young pagan environmentalists. In: Feraro, S.; White, E.D., eds. Magic and witchery in the Modern West: Celebrating the twentieth anniversary of "Triumph of the Moon". New York: Springer International Publishing: 131–52.

Soulé, M.; Noss, R. 1998. Rewilding and biodiversity: complementary goals for continental conservation. Wild Earth. 8(3): 19–28.

Vest, J.H.C. 1985. Will-of-the-land: wilderness among primal Indo-European peoples. Environmental History. 9(4): 323–329. doi:10.2307/3984462

Vogel, S. 2003. The nature of artifacts. Environmental Ethics. 25(2): 149–168. doi:10.5840/enviroethics200325230

Vogel, S. 2015. Thinking like a mall. Cambridge, MA: MIT Press.

Ward, K. 2019. For wilderness or wildness? Decolonising rewilding. In: Pettorelli, N.; Durant, S.M.; du Toit, J.T., eds. Rewilding. Cambridge: Cambridge University Press: 34–54. doi:10.1017/9781108560962.003v

Whyte, K.P. 2024. Why does anything need to be called wild? In: Minteer B.A.; Losos, J.B., eds. The heart of the wild: essays on nature, conservation, and the human future. Princeton, NJ: Princeton University Press.

Nature as Landowner:
Reimagining Property Doctrines to Incorporate the Interests of the More-than-human World

BY JESSICA OWLEY and KAREN BRADSHAW

Abstract

American law, particularly property law, traditionally places humans at the center of legal considerations. This human-centric approach values individuals over communities and prioritizes fixed rules over flexibility. Such an anthropocentric perspective, however, is at odds with a healthily functioning socio-ecological system. To address this imbalance, we suggest reimagining our property doctrines to incorporate nature. In this Commentary, we give three examples of classic property law doctrines taught in many first-year property classes: adverse possession, the doctrine of waste, and customary rights. We explore what it would mean for legal thinkers to reconceptualize nature and the more-than-human world to be actors on the property law stage rather than just the backdrop and the props.

Background

Historically, American property law has been rooted in individualism; conventional Western property law prioritizes the interests of individual owners over other human and nonhuman communities who are affected by the land and ecosystem in question. A quickly growing body of legal scholarship questions the human-centric approach (e.g., Bradshaw 2020; Fensterseifer and Leite 2024; Preston 2014). The approach's combination of inflexible rules and a focus on the short term has often led to the exploitation of natural resources and disregard for the intrinsic value of ecosystems. Some scholars suggest that many property issues are a product of the worldview of land as a thing to be owned by humans exclusively, instead of as an ecosystem with resources to be shared by a rich and varied community of humans and the plants, animals, water systems, climatic, and geographic features of the area (e.g., Hoops 2022). One response is to dispense of property as a frame in favor of Wild Law (Cullinan, 2011). This ambitious reframing is deemed appropriate based on a belief that many false premises on which jurisprudence is based, namely human superiority, human separation from nature, and humans as the sole subjects in a world of objects, along with the resulting materialistic and mechanistic system of governance, cannot otherwise be overcome. We take a different perspective, showing how existing systems of property and government can be adjusted to reflect the more expansive worldview that nature matters. In this Commentary, we illustrate how conventional property doctrines can be applied to address these ecological and social harms that can emerge when nature remains solely a backdrop to human activities.

Jessica Owley *a Professor at the University of Miami School of Law and Rosenstiel School for Marine, Earth and Atmospheric Sciences.* ***Karen Bradshaw*** *a Professor at the Sandra Day O'Connor College of Law and Senior Global Futures Scientist at Arizona State University.*

The individualistic nature of contemporary U.S. property law is evident in Supreme Court decisions that have favored the rights of individual landowners over collective environmental interests. In *Sackett v. EPA* (2023), for instance, the Court prioritized an individual's right to build a home on a lake over the community's right to clean water and an ecosystem's right to thrive. This case reflects a broader bias towards valuing individual rights over collective well-being; this individualistic view is at odds with the interconnectedness of nature and the importance of preserving ecosystems for future generations. It reflects a fundamental tension in American property law, rooted in English Common Law systems.

This human-centric focus on individual rights has often led to the exploitation of natural resources and the disregard of non-human interests. This focus is easily seen in our approaches to legal education. When addressing issues related to animals or wildlife, property law courses focus on determining human ownership rather than acknowledging the intrinsic rights of the animal beings. For example, the paradigmatic first-year case of *Pierson v. Post* (1805) considers which of two hunters owns the dead body of a fox that one killed. It does not engage questions of the fox's bodily autonomy or whether wildlife is reducible to private property. Similarly, contemporary Western property law envisions natural resources as commodities to be exploited for human benefit, rather than as integral parts of a complex ecosystem.

The inflexibility of property law further compounds these issues. With its emphasis on fixed rules, property law can hinder adaptation to changing environmental conditions and limit the ability of communities to address emerging ecological challenges (Ehrman 2025). For example, the rule of capture in water law, which grants ownership rights to the first person to capture and use a water resource, has led to the overexploitation of groundwater and surface water resources in many areas. This can result in the depletion of aquifers, the drying up of streams and rivers, and other ecological damage. The rule of capture prioritizes individual ownership rights over the sustainable management of shared water resources, making it difficult for communities to address water scarcity or implement conservation measures (Hirokawa 2010/2011). Emphasis on fixed rules can hinder adaptation to changing environmental conditions and limit the ability of communities to address emerging challenges.

Finally, the short-term focus of property law often fails to account for the long-term consequences of resource use and environmental degradation. Although ecosystems theoretically exist in perpetuity, law has a short time horizon. Legal doctrines such as adverse possession, which allows individuals to gain ownership of property through continuous use over a specified period, prioritize immediate use over long-term stewardship. This narrow temporal perspective hinders the development of sustainable property practices that consider the needs of both present and future generations. In other conceptions of property, encapsulated in other worldviews, humans have responsibilities both to ecosystems and to future human generations.

Rethinking Fundamental Property Doctrines

Our inherited system of property should be critically analyzed. To what extent does it reflect our worldviews about the human relationship with land and with one another? Contemporary Western property law focuses heavily on rights of property owners but neglects many of the responsibilities, particularly to future land users. By recognizing the limitations of individualism, human-centrism, inflexibility, and short-term thinking, we can begin to develop a more holistic and adaptive approach to property that better aligns with the realities of our interconnected world. This Commentary gives three examples from American property law (similar doctrines are found in many countries) and illustrates how we could reimagine these doctrines to be more nature-centered.

Adverse Possession

The doctrine of adverse possession creates a mechanism for a nontitle holder who occupies land to become the acknowledged landowner. A person who possesses another's land for a statutory period, under certain conditions, can acquire legal title to the land. It is often justified by the principle of "use it or lose it," which prioritizes active land use over seemingly passive ownership.

To reimagine adverse possession, we go beyond a battle between a present possessor and an absent title holder to consider the needs of the broader community—a community that includes nature. One approach is to envision a legal system that acknowledges nature itself as a title holder, with inherent rights that underlie and dominate the rights of human occupants. Under the doctrine of adverse possession, nature has always—and will always have rights to land. These rights need not exclude human uses, but they can exist as an overlay on the landscape—creating a theoretical, conceptual understanding that every notion of property necessarily includes nature as a land and resource user, with rights that must be respected. This perspective recognizes the intrinsic value of ecosystems and challenges the anthropocentric view of landownership.

To demonstrate adverse possession, a claimant must show that they have actively used the land in an open, notorious, and hostile manner. A key element that is at odds with a nature-forward approach is the condition of active land use. The standard is usually described as requiring the adverse possessor to use the land in the way that a normal landowner would (e.g., *Roche v. Town of Fairfield* (Conn. 1982); *Burkhardt v. Smith* (Wis. 1962)). This human-centric definition of "use" often focuses on extractive activities that degrade the ecological health of the land, such as mining, logging, or construction (Sprankling 1994). While some cases acknowledge that recreational uses may be sufficient (*Klingel v. Kehrer* (Illinois 1980)), the emphasis remains on human activity.

Instead of focusing on human use, a more holistic approach would consider the ecological functions of the land and the impact of human activities on those functions. What role is nature playing in this landscape? How do wildlife, trees, and fungi occupy and use this land? How does this parcel interact with or impact the surrounding ecosystem, such as a larger forested area, waterbody, or riparian zone? How do wildlife, trees, and fungi occupy and use this land? Why shouldn't their use be legitimate enough to supersede human use?

Adverse possession cases like other property law doctrines, result in all-or-nothing determinations by courts. One entity is acknowledged as the landowner, with their rights being the only ones that can be legally recognized. We never share the land. This binary approach fails to account for the possibility of shared land use and the interests of parties not before the court. It also fails to accommodate the many ways in which law flexibly accommodates multiple competing ownership interests, such as tenants-in common, the split estate, and pueblo (communal) water rights.

How might we instead think of multiple interests in the land and seeking solutions that help humans and non-humans thrive? The doctrine of adverse possession could be modified to require that claims be balanced against the interests of the broader socio-ecological community, including the preservation of natural resources and ecosystems. In successful adverse possession claims concerning land with special ecological or social value, such as supporting ecologically significant habitats or species, or promoting human connection with nature, ownership could carry additional responsibilities or be conditioned on the continued protection of ecological rights on the land; alternatively, the landowner's rights to develop or depose the land could be restricted when conflicting with these interests. These are concepts similar to those suggested in Wild Law (Cullinan 2011). State adverse possession statutes could be modified relatively easily to include ecological considerations in the balancing process and a process for imposing ecological conditions, restrictions, or responsibilities to titles awarded by adverse

possession. By reconceptualizing adverse possession through an ecocentric lens, we can develop a more inclusive and sustainable approach to landownership—one that recognizes the inherent rights of nature and the importance of preserving ecological integrity for the benefit of all community members, both present and future.

Doctrine of Waste

The doctrine of waste, a longstanding principle in property law, imposes obligations on life tenants and other temporary possessors of land to maintain the property in a reasonable state of repair and prevent "waste" (Restatement 4th). In the context of property law, waste refers to any act or omission by a temporary possessor of land, such as a life tenant or lessee, that causes unreasonable damage to the property or diminishes its value, thereby harming the interests of future owners or reversioners. This doctrine is designed to protect the interests of future owners who have a right to receive the property in a reasonably intact condition (*Melms v. Pabst Brewing Co*. (Wis. 1899)).

What would it mean to reimagine this doctrine in a way that puts nature first? The traditional application of the doctrine of waste focuses on the rights of human owners, both present and future. To reimagine this doctrine in a way that puts nature first, we must expand our understanding of ownership and consider the ecological implications of land use. It would be plausible to read the doctrine of preventing waste into a responsibility of a landowner. To waste land—or damage it irrevocably—is to steal from future generations, just as a life estate holder burning down a home is to steal it from the future estate holder.

Currently, the doctrine is only triggered when there is a future landowner. Outside of landlord–tenant relationships, this is not a frequent occurrence. A groundbreaking approach would be to recognize nature itself as a perpetual owner, with inherent rights that exist alongside those of human occupiers. By acknowledging that nature has a stake in the land, past, present, and future, we can reframe the doctrine of waste to limit the ability of current human occupiers to exploit the land in ways that harm the broader ecological system. Under this ecocentric interpretation, the doctrine of waste would be triggered not only when there is a human future landowner but also in recognition of nature's ever-present ownership interest. This approach would impose a duty on current possessors to maintain the ecological integrity of the land and prevent activities that degrade natural resources or disrupt ecosystem functions.

This approach to waste would require a reevaluation of what constitutes "waste" in the context of land use. Instead of focusing solely on physical damage to human-built structures or economic loss, the doctrine would need to consider the ecological impact of land-use practices. Activities that degrade soil health, pollute water resources, or destroy wildlife habitat would be seen as forms of waste, even if they do not directly harm human-made improvements on the land. For example, unremediated pit mining might create waste. As the specifics of what constitutes waste is generally based on common law, such a shift in legal doctrine would likely occur slowly over time, as cases are repeatedly interpreted in this manner by additional and appellate courts.

Reimagining the doctrine of waste with nature at the center challenges us to rethink landownership. By recognizing nature as a perpetual owner with inherent rights, we can develop a legal framework that prioritizes the long-term health and resilience of ecological systems. This reimagining of the doctrine of waste aligns with recent judicial efforts, such as atmospheric trust litigation, that seek to recognize the rights of future generations to inherit a healthy and functioning environment (*Juliana v. United States* (Oregon 2016)). By extending this principle to the doctrine of waste, we can ensure that the interests of both future human generations and the natural world are protected.

Customary Use Rights and Easements

Customary use rights are rights that have been exercised for a long period and are recognized as part of the law. In the context of property law, customary rights often involve the use of common resources or access to private property by members of the public. They can protect access to and use of recreational areas, such as beaches or trails.

In many jurisdictions, the doctrine of customary use has been applied to establish public access easements. For example, in *City of Daytona Beach v. Tona-Rama, Inc.* (Fla. 1974), the Florida Supreme Court recognized a customary right of the public to access and use the dry sand area of the beach for recreational purposes. The court held that this right had been exercised for so long that it had become a part of the law of the state, effectively creating a public easement. Similarly, in *State ex rel. Thornton v. Hay* 462 P.2d 671 (Or. 1969), the Oregon Supreme Court upheld a customary right of the public to access the dry sand areas of the state's beaches. The court noted that this right had existed since "time immemorial" and was not subject to individual property rights.

The recognition of customary rights of access has significant implications for the balance between private property rights and public use. By establishing public easements based on long-standing customary use, courts can ensure that the public retains access to important recreational and cultural resources, even when those resources are located on private property. Yet, the application of customary rights focuses on human uses. What if we extended this concept to recognize the customary rights of nature itself?

How can the courts ensure that nature retains access to important resources? Animals and ecosystems will easily be able to establish long-standing use of the physical land. Can law ensure that they retain access to needed areas? Reimagining the doctrine could involve a shift in our understanding of property boundaries and easements. Instead of focusing solely on human use and access, we consider the needs of nonhuman species and ecosystems that have used the land since time immemorial.

One potential application of this approach could be the establishment of "ecological easements" based on the customary rights of nature. These easements could protect critical wildlife corridors, ensure access to water resources, and maintain the connectivity of habitats across property boundaries. By recognizing the customary rights of nature to access these areas, we could create a legal framework that promotes biodiversity and ecosystem health. Importantly, it is not necessary to proactively define all customary rights. They lay dormant until a conflict emerges; thus they need not be identified in advance of their need.

Akin to conservation easements, ecological easements could recognize protection of nature as a valid constraint under the law, and similarly be statutorily implemented, but differ from traditional conservation easements in a few key ways. Importantly, they are not driven by landowner choice. Conservation easements are voluntary legal agreements between a landowner and a government agency or land trust that permanently limit the use of the land to protect its conservation values. Conservation easements are typically driven by human conservation goals and are subject to negotiation between the landowner and the conservation easement holder (Owley 2006).

In contrast, ecological easements based on customary rights would arise from the long-standing access needs of nonhuman species and ecosystems, rather than human conservation priorities. These easements would be recognized as a matter of law, based on the principle that nature has a customary right to access areas that have been essential to its functioning since time immemorial (Stone 1972).

Moreover, while conservation easements are typically static and focused on preserving the current state of the land, ecological easements based on customary rights would be more dynamic and adaptive. They would recognize that ecological systems are constantly evolving and that access needs may change over time in response to factors such as climate change or habitat fragmentation.

Another key difference is that conservation easements are often focused on protecting specific conservation values, (such as scenic views or recreational opportunities) or securing favorable tax status for working landscapes (such as farms and forests) while ecological easements based on customary rights would prioritize the needs of nonhuman species and ecosystems. This could lead to the protection of areas that may not be considered "pristine" or aesthetically valuable from a human perspective but are essential for the survival and resilience of ecological communities.

These ideas are just a starting point. Customary rights could also be extended to recognize the rights of nature to exist and flourish. For example, Indigenous communities could assert customary rights to protect sacred sites or ecosystems. Customary rights could be framed as a means of ensuring intergenerational justice, recognizing the rights of future generations to access and benefit from natural resources. Ultimately, ecological easements based on the customary rights of nature would represent a paradigm shift in our approach to land conservation. By recognizing the inherent rights of nature to access and prioritizing the needs of nonhuman species and ecosystems, we could develop a legal framework that promotes biodiversity, connectivity, and resilience in our rapidly changing world (Takacs 2008). As Cullinan (2011) notes, we can repudiate human superiority and separation from nature to recognize that humans are part of a bustling natural world, on which we depend for countless resources and must protect for the benefit of all who live in it. We maintain, however, that it is possible to do this within the bounds of the law.

Conclusion

In a moment where the public is seeking to reconceptualize the human relationship with nature, lawyers must think creatively about how to wield the traditional tools of our craft to meet modern challenges. In this Commentary, we identify specific harms that accrue from the limitations of the worldview underlying contemporary systems of property. Then, we show how, by reimagining property doctrines to put nature first, we can create a legal framework that better reflects the interconnectedness of all living beings and promotes the long-term sustainability of our planet. This will require a significant shift in our understanding of property rights and a commitment to protecting the interests of both humans and nonhumans. But, it is within our reach—the existing tools can be wielded in such a way as to reshape conceptions of ownership in ways that meet emerging perspectives of the validity and importance of the more-than-human world.

References

Bradshaw K. 2020. Wildlife as property owners: A new conception of animal rights. Chicago, IL: University of Chicago Press.

Cullinan, C. 2011. Wild Law: A manifesto for Earth Justice. 2nd ed. White River Junction, VT: Chelsea Green Publishing.

Ehrman, M.U. 2025. Gravitational property theory. Georgia Law Review. 59 (forthcoming).

Fensterseifer T.; Leite J.R.M. 2024. Towards ecological law? Environmental law on the threshold of a new ecocentric legal paradigm in the Anthropocene. DPCE Online. 64(2): 912–930.

Hirokawa, K.H. 2010/2011. Property as capture and care. Albany Law Review. 74: 176–239.

Hoops, B. 2022. Of forests and rivers owning themselves: Looking for a place for Te Urewera and Te Awa Tupua in constitutional property law and theory. Journal of Law, Property, & Society. 7(3): 126–159.

Owley, J. 2006. The emergence of exacted conservation easements. Nebraska Law Review. 84: 1043–1112.

Preston, B.J. 2014. Internalizing ecocentrism in environmental law. In: Maloney, M.; Burdon, P., eds. Wild law—in practice. London: Routledge: 75–95.

Restatement (4th) of Property. Tentative Draft No. 3. 2022. American Law Institute. Chapter 5.

Sprankling, J.G. 1994. Environmental critique of adverse possession. Cornell Law Review. 79(4): 816–884.

Stone, C. 1972. Should trees have standing?—toward legal rights for natural objects. Southern California Law Review 45(2): 450–501.

Takacs, D. 2008. The public trust doctrine, environmental human rights, and the future of private property. New York University Environmental Law Journal. 16: 711–765.

Cases

Burkhardt v. Smith, 115 N.W.2d 540 (Wis. 1962).

City of Daytona Beach v. Tona-Rama, Inc. 294 So. 2d 73 (Fla. 1974).

Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016).

Klingel v. Kehrer, 401 N.E.2d 560 (Ill. App. Ct. 1980).

Melms v. Pabst Brewing Co., 79 N.W. 738 (Wis. 1899).

Pierson v. Post, 3 Car. R. 175 (Sup. Ct. NY 1805).

Roche v. Town of Fairfield, 442 A.2d 911 (Conn. 1982).

Sackett v. Environmental Protection Agency, 598 U.S. 651 (2023).

State ex rel. Thornton v. Hay, 462 P.2d 671 (Or. 1969).

Untrammeled, Not Untraveled:
Toward a Human Ecology of Wilderness

BY ERIC G. KEELING

Introduction

The human dimension in ecology is getting increasing attention from ecologists. But incorporating human–nature interactions into ecological thinking and teaching can be perplexing. Pervasive human environmental impacts create a sense of a "used planet" (Ellis et al. 2013) while immersive interactions with and within built and screen-based environments play into broader skepticism with the very idea of nature (Morton 2009; Vogel 2015). Curiously, wilderness, as a locus of impactful human–nature relationship, is generally overlooked or misunderstood in these discussions.

In this essay, I look at wilderness through the disciplinary lens of ecology. Ecology, at its simplest, is the study of relationships between organisms and their environment. But to see wilderness through the lens of ecology, we will need a *human* ecology, which adds layers of complexity. Human ecology considers relationships between people and their biophysical–social–cultural–technological–virtual environments. A human ecology of wilderness would study the effects of human–wilderness relationships across the range of those environments, both inside and outside designated wilderness. I believe this approach can clear up certain misconceptions about wilderness and contribute new ideas to human ecology as a developing field.

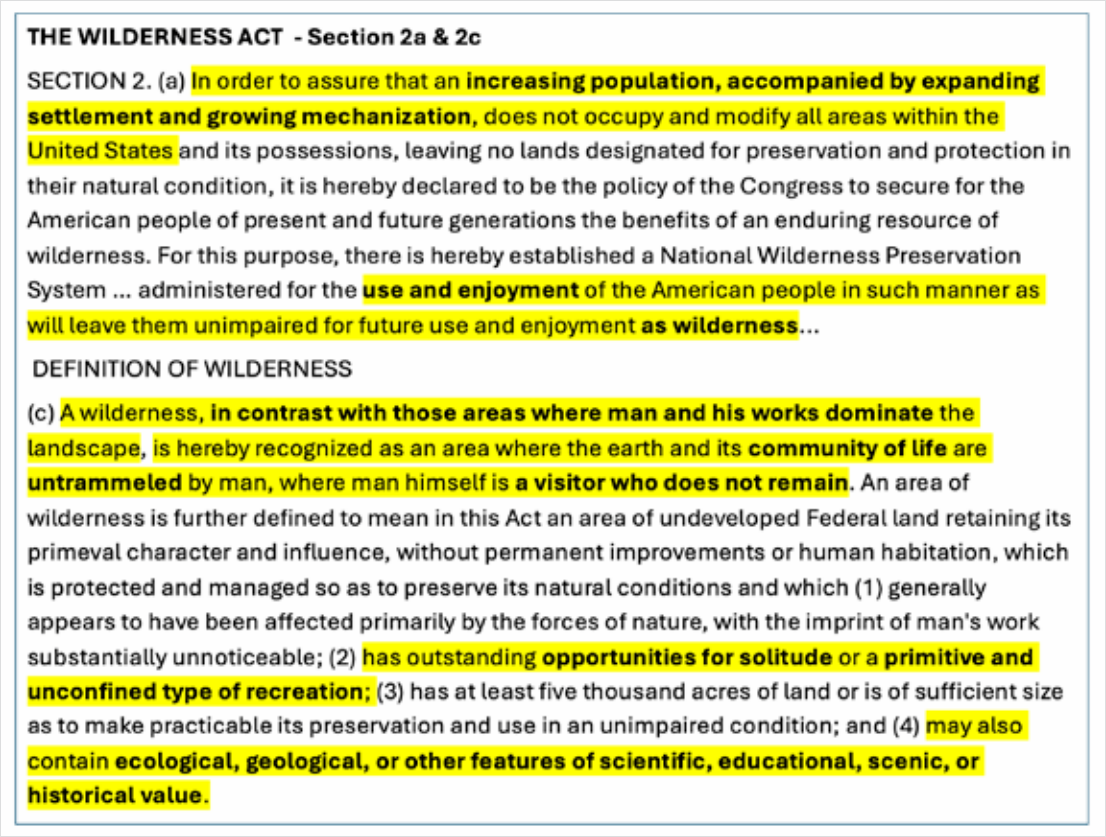
Of course, any conceptualization of human ecology must recognize cultural differences. The 12th World Wilderness Congress was noteworthy for highlighting the cultural diversity of wilderness ideas, with special attention to Indigenous views. A stated goal in the WILD12 Hé Sapa Declaration 1 (2024) is reconciliation between Western and Indigenous views, and a deeper, broader, expanded wilderness idea. The perspective in this essay is that of a typical American backcountry hiker and camper. While my focus is the wilderness idea as expressed in the US Wilderness Act, I am hopeful that seeing wilderness through the lens of modern ecology can help move us toward a multi-cultural, shared understanding of wilderness.

Human–Nature Relationship in the U.S. Wilderness Act

The opening phrase of the US Wilderness Act declares that wilderness is needed "In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States*"* (Figure 1). This shows that the central concern is the expansionist, mechanized land use of modern industrial Euro–American people. In "Definition of Wilderness" (Sec. 2c), we see that the specific concern is *domination* of land by those same people. *Untrammeled,* the key word in the subsequent clause, contrasts with *domination*. There is ample guidance interpreting the meaning and implications of "untrammeled" land (e.g., Kaye 2018; Kammer 2013; Keeling 2007; Kelly and Landres 2023; Zahniser 1959). Untrammeled does not mean untrampled, pristine, or untouched. A trammel is a physical object, a shackle

Eric Keeling *is Associate Professor of Biology at the State University of New York at New Paltz, 1 Hawk Drive, New Paltz NY, 12561. Phone: 845-257-3745. Email: keelinge@newpaltz.edu*

or a hobble that restricts the freedom of movement of an animal, usually a horse; or it is a net for ensnaring and confining fish. In the plain language of the Wilderness Act, untrammeled land is land where we strive to keep the community of life *free from domination* by human works, especially works involving mechanization .



THE WILDERNESS ACT - Section 2a & 2c

SECTION 2. (a) In order to assure that an **increasing population, accompanied by expanding settlement and growing mechanization,** does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose, there is hereby established a National Wilderness Preservation System ... administered for the **use and enjoyment** of the American people in such manner as will leave them unimpaired for future use and enjoyment **as wilderness**...

DEFINITION OF WILDERNESS

(c) A wilderness, **in contrast with those areas where man and his works dominate** the landscape, is hereby recognized as an area where the earth and its **community of life** are **untrammeled** by man, where man himself is **a visitor who does not remain**. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding **opportunities for solitude** or a **primitive and unconfined type of recreation;** (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain **ecological, geological, or other features of scientific, educational, scenic, or historical value.**

Figure 1 - Excerpts from the US Wilderness Act of 1964, with passages referenced in the text highlighted and key phrases in bold.

The phrase "visitor who does not remain" is frequently interpreted as reflecting a dualistic, Western-biased notion of separation between humans and nature (Cronon 1995) that excludes the possibility of meaningful relationships for people with and within wilderness (Chan et al. 2016). But the Act explicitly states that wilderness is for "the *use and enjoyment* of the American people and should provide "outstanding opportunities for solitude or a primitive and unconfined type of recreation" (Sec. 2a, 2c; emphasis added). It may also "contain features of ecological or geological value", and serves the broader "public purposes of scenic, scientific, educational, conservation, or historical use" (Sec. 2c, 4b). These purposes certainly leave open rich possibilities for both personal and societal relationships with wilderness. Moreover, Howard Zahniser, the Act's principal author, penned a slightly different version of this definition which didn't make it into the final wording of the Act. It read "… where man is himself *a member of the natural community*, a transient whose travels leave only trails" (Zahniser 1963, emphasis added). The assertion that humans are members of the natural community, and that wilderness plays a vital role by providing a setting for this realization, is reinforced in many other writings from wilderness commentators past and present (e.g., Fincher 2012; Friskics 2008; Havlick 2006; Keeling 2008; Leopold 1935; Marshall 1954; Woods 2017; Zahniser 1956).

Wildness and the Broader Ecological Context of Wilderness

Even so, "use and enjoyment" or "primitive recreation" may seem like superficial values for building a human ecology of wilderness. We are indeed only temporary visitors in wilderness areas. Our lives and livelihoods are rooted in the places where we live and work. Following the lead of urban ecologists who expanded the domain of ecology to include the study of cities (Pickett et al. 2014; Marzluff et al. 2008), a human ecology of wilderness should connect wilderness experience to the broader context of modern life.

I offer a personal example to explore this connection. When I step outside my door each morning for my walk to campus, I am hit by wild air – air that has not been controlled by humans for my personal comfort. On my skin, I feel the touch of wild wind. And simultaneously I am hit by wild and ancient light – the light of the sun. Passing through a patch of remnant forest along a small creek, I might hear songbirds or insects, see a squirrel or hawk, or a turtle in the creek. These encounters are reminders of a world in our midst that moves to its own rhythms.

This walk is not in wilderness. I'm in town near a busy road. The nearest legally designated wilderness area is 50 miles away. But some of what we may call *wilderness character* or *wildness* exists in these instances of wild nature that grace our farms, towns, and cities. "Wild" is common shorthand for "untrammeled", "self-willed" or "free from (intentional) human control", even in a time of global anthropogenic change (Cole et al. 2016, Kammer 2013, Kaye et al. 2014, Kaye 2018, Keeling 2007, Kelly & Landres, 2013; For important nuances see Kaye 2018 and Woods 2014 p 262–267). "Wildness is the essence of wilderness", said Zahniser, "… yet it characterizes also that which is not wilderness". Wildness is "close at hand" in any area that is "more or less free from the trammels of man's domesticating genius" (Zahniser 1963).

Our awareness of wildness in our environments can deepen through contemplative practices, nature study, or outdoor recreation. But because these activities are not driven by direct material needs (food, building materials, fuel) they fall outside the scope of conventional ecology. Even on a typical wilderness trip, our material needs are met mostly via items brought from outside wilderness. Except for fetching water, we are generally not "living off the land". Can the mere experience and appreciation of wildness also be ecological?

Wildness and Human Sensory Ecology

Ecological relationships are grounded in organismal "informational interactions" via sensory experience (vision, hearing, touch, smell, taste) (Dusenberry 1992). *Sensory ecology* is the study of how organisms process and respond to external stimuli in their environment (Dangles et al. 2009; Burnett 2011). The discovery that artificial light affects sea turtle reproduction is an example of applied sensory ecology. *Human* sensory ecology suggests a methodology for studying non-material (informational) human–environment interactions by connecting objective characteristics of environments to the subjective experiences they induce. Current examples include the NPS Dark Sky Program, protection of "soundscapes", and the USFS and NPS Wilderness Character Monitoring programs (Landres et al. 2015). These programs explicitly recognize a conservation value for a broad range of sensory experiences.

In my classes, I assign a "Human Sensory Ecology" field activity. I give my students a data sheet and send them out for one hour to record their sensations, reflections, and insights. The assignment elicits a diverse range of fascinating student responses, most resoundingly positive. Sensory awareness that lies fallow can be reawakened. But in the big picture, these experiences are fleeting and scattered. Social obligations and the distractions of technology persistently draw our attention away from the wildness around us. Just as I can tune into my surroundings on my walk, I can also be lost in mental activity, planning my day, or staring at my phone. In the modern setting, isolated experiences may not have the power to sustain our appreciation for wildness.

The Significance of Wilderness Experience

As noted, most of us do not rely on our immediate ecosystem to meet our material needs when we are in wilderness. Ironically, this is also true *outside* of wilderness. Wherever we are, as typical Americans, we are "biosphere people" not "ecosystem people" (Dasmann 1988). As biosphere people, we won't be living off the land in wilderness, but we will be living – for a time – *with* the land. We may be cooking food we brought with us (grown who knows where) using a propane-burning stove from REI, but we do so coping with wind, on a patch of level ground we had to scout or scrape for, with water carried from a nearby stream. When we finish, we hang our remaining food in a tree. Wilderness is more than just mere sensations. It is a place for extended bodily and mindful engagement within an environment that is more visceral and consequential because it lacks the main trappings and conveniences of modern civilization. What is the significance of these experiences?

The US wilderness movement, culminating in the passage of the Wilderness Act, is a rare example of anti-hubris by a people coming to terms with their increasing technological control of nature. To withhold our domination over land is to foster "an intelligent humility" toward our place in the natural world (Leopold 1935). From that position of humility, wilderness beckons us to the mountains, deserts, forests, or canyonlands and awakens us to our raw evolutionary context and to the possibility of self-realization as individuals and as a species. Albert Borgmann, who is interested in what philosophers call "the good life", says "…our significance comes fully to life only in the engagement with things that we recognize and respect in their own right" (Borgmann 1984, p 193). And he highlights wilderness as a place where we can begin to understand this, where we can "recognize something that is other and greater than ourselves" (p 190; See also Kaye et al. 2014).

Wilderness and Human–Technology Relationship

But Borgmann is really interested in what wilderness can teach us about technology. He points out that "when we bring technology into the wilderness, our relations to technology become clarified and well-defined" (Borgmann 1984, p 197; See also Havlick 2006). To be comfortable and safe in wilderness we bring technology with us. But we also leave our most powerful technologies behind, providing an opportunity for critical reflection. A revelation is that what we seek in wilderness cannot be procured by technology. Technology converts things into resources and devices. But the bear or the hawk we see in wilderness exist "in their own splendor... profoundly alive and eloquent" (p 192). Technology can be used to kill the bear, or make a video of the hawk, but it won't produce the "experience of seeing the expanse and fertility of the land focused in such a creature" (p. 190). It cannot replace their autonomy or the mystery of our common origin and kinship with them.

Using tools in wilderness involves what Borgmann calls focal practices – hiking, route finding, cutting wood, building fires, cooking, tying knots, hanging food, treating wounds, finding water. These are practices that require skill, patience, and attentiveness. Engaged in focal practices, our technology is not simply a means of

obtaining a commodity. As Borgmann says, with focal practices "effort and joy are one", the "split between labor and leisure" is healed, and there is a "unity of achievement and enjoyment, of competence and consummation" (Borgmann 1984, p 202–203). We bring this perspective back from wilderness and we find resonance with focal practices at home such as running, walking, knitting a sweater, playing a musical instrument, preparing a home-cooked meal, making home repairs, drawing and making crafts. Focal practices remind us that there is more to life than just getting everything we need instantly, with no need for personal skills or effort. Through engagement with focal practices, wilderness teaches us that we could be happy with less—less stuff, less consumption, less distraction.

Wilderness in a Socio–Ecological Systems Model

But as geographer David Havlick puts it, "There is no single lesson that wilderness teaches, and that is part of its promise" (Havlick 2006, p. 56). Certainly, wilderness was never envisioned as a solution to the host of modern-day challenges we call "environmental problems" (cf. Cronon 1995). Even so, it is not far-fetched to ask whether wilderness can shape our values, change our behaviors, or contribute to broader environmental sustainability. Accordingly, I present a hypothetical socio–ecological systems model as a tool for exploring some of the dynamics of a human ecology of wilderness (Figure 2). The model shows a causal loop where wilderness protection is reinforced by wilderness experience, and links that loop to a similar set of relationships outside of wilderness. Possible broader societal effects of these two feedback loops are also shown (Borgmann 2017; Fincher 2012; Havlick 2006; Leopold 1949; Keeling 2024).

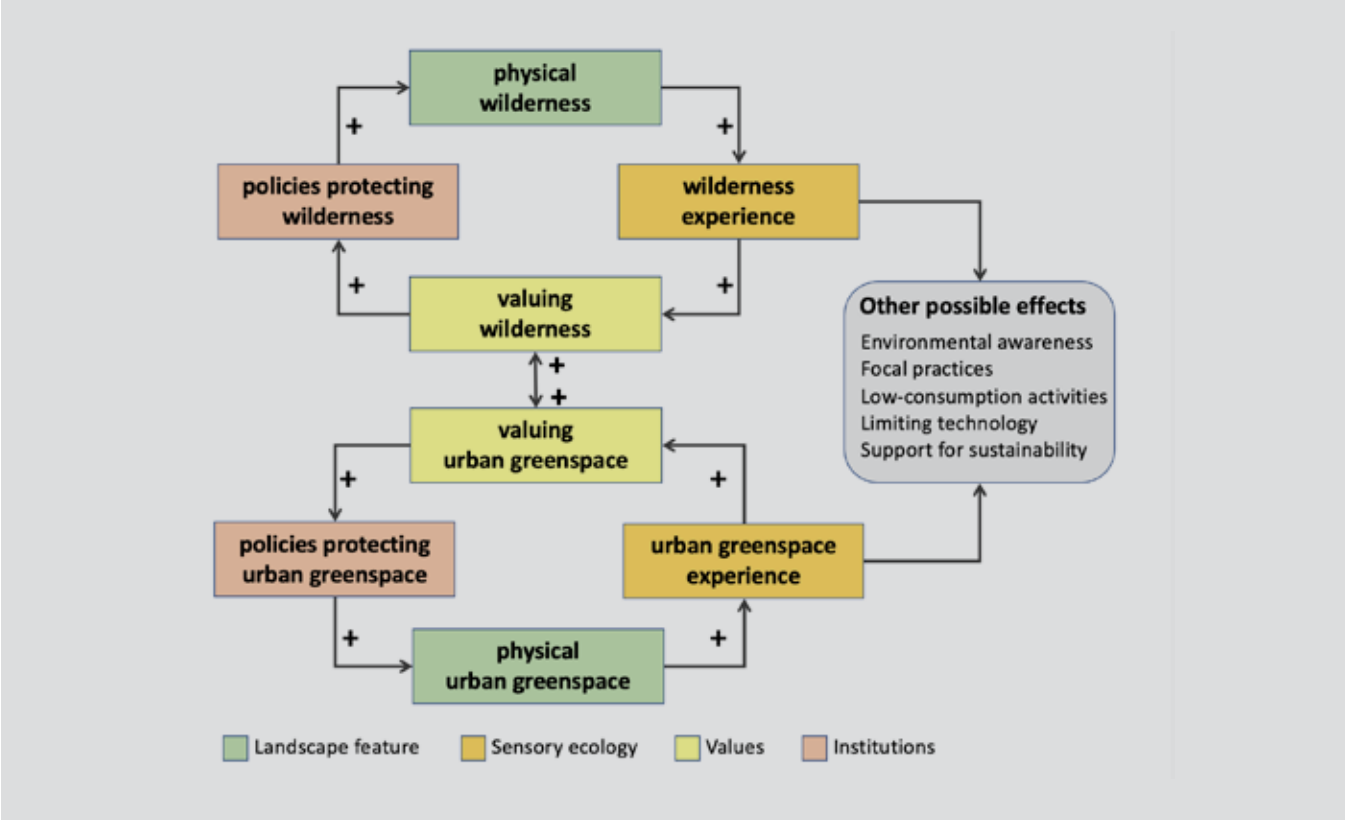


Figure 2 - Hypothetical socio–ecological systems model positing causal relationships between landscape features, sensory experiences, values, and institutions (which includes policies and laws) in two interconnected feedback loops, with possible broader societal effects. The model is based on Machlis et al.'s "Human Ecosystem" model (1997), as presented in Grove et al. (2012). Not all possible causal factors affecting system components are depicted.

The model implies a balance of possibility for wonder and connection to wild nature across the urban–rural–wild landscape continuum. If these connections are plausible, wilderness allows, and perhaps even encourages "recognizing and taking responsibility for the sacred in our everyday lives and landscapes" (Cronon 1996, p 55). Of course, I am only providing personal evidence for this claim in this essay. But I have also not seen or heard convincing evidence for the opposing conjecture, Cronon's "principal objection" that wilderness "…may teach us to be dismissive, or even contemptuous" of "the wildness in our backyards" and the "nature that is all round us" (Cronon 1995, p 22). Reciprocally, the model also suggests that fostering awareness of wildness in our humanized landscapes nurtures an appreciation for the value of protecting large areas of untrammeled wilderness (see also Plumwood 1998).

But the presence of wildness inside and outside of wilderness should not lead to complacency about wilderness protection. If we were to withdraw US Wilderness Act status and protection from a local wilderness area, we could gradually fill in the land with incremental developments—a road here, an outpost there, some farms here and there, a small hamlet or two with more connecting roads, eventually perhaps an expanding urban center. We might then decide to carve out from our "working landscape" a few small preserves or urban parks, each bordered by agricultural fields or busy boulevards. Formerly designated wilderness could easily be converted to other uses, including urban greenspaces. But the reverse process is harder to imagine under any relevant timeframe. While remnant pockets of wildness would still survive in the margins of the developed landscape, the opportunity for immersive wilderness experience would be diminished. Moreover, non-experiential values of wilderness also depend on the existence of designated wilderness (Schuster et al. 2005). For these reasons, I believe physical wilderness anchors and sustains the two feedback loops in Figure 2.

Summary

The US Wilderness Act describes a non-dualistic, humility-based human–nature relationship with land that we do not dominate. The integrated, focal experience of being in wilderness awakens us to our deepest evolutionary and ecological contexts and to our kinship in the community of life—a relationship with something immediate and present that is other and greater than ourselves. Beyond providing habitat for wild species and ecosystems, wilderness can reorient human ecology to the immanence of wild nature and provide a balancing counterforce to a world of increasing material consumption and immersive technology. From a socio–ecological systems perspective, physical wilderness is a likely anchor for a multi-scale connection to wild nature that may have broader ecological significance. Protected from expanding settlement and increasing mechanization, wilderness will endure and can be used and enjoyed… *as wilderness*, by future human travelers, for generations to come.

Acknowledgements

The author would like to thank Paul Keeling and an anonymous reviewer for providing helpful comments and suggestions on this paper.

References

Borgmann, A. 1984. Technology and the character of contemporary life: A philosophical inquiry. University of Chicago Press.

Borgmann, A. 2017. The force of wilderness within the ubiquity of cyberspace. AI & society. 32, 261-265.

Burnett, S. 2011. Perceptual worlds and sensory ecology. Nature Education Knowledge. 3(10): 75.

Chan, K.M.A., Balvanera, P.; Benessaiah, K. [et al.]. 2016. Why protect nature? Rethinking values and the environment. Proceedings of the National Academy of Sciences. 113(6): 1462–1465.

Cole, D.; Scott, D.; Zahniser, E. [et al.]. 2016. The definition of wilderness character in "keeping it wild" jeopardizes the wildness of wilderness. Wilderness Watch. 1(1): 1–12.

Cronon, W. 1995. The trouble with wilderness: Or, getting back to the wrong nature. Environmental History. 1(1): 7–28.

Cronon, W. 1996. The trouble with wilderness: A response. Environmental History. 1(1): 47–55.

Dangles, O.; Irschic, D.; Chittka, L.; [et al.]. 2009. Variability in sensory ecology: Expanding the bridge between physiology and evolutionary biology. Quarterly Review of Biology. 84: 51–74.

Dasmann, R.F. 1988. Toward a biosphere consciousness. In: Worster, D., ed. The ends of the Earth: Perspectives on modern environmental history. Cambridge University Press: 277–288.

Dusenberry, D. 1992. Sensory ecology: How organisms acquire and respond to information. New York: W.H. Freeman Co. 558 p.

Ellis, E.C.; Kaplan, J.O.; Fuller, D.Q. [et al.]. 2013. Used planet: A global history. Proceedings of the National Academy of Sciences. 110.20: 7978–7985.

Fincher, M. 2012. Humans apart from nature? Wilderness experience and the Wilderness Act. In: Cole, D.N., comp. Wilderness visitor experiences: progress in research and management; 2011 April 4–7; Missoula, MT. Proc. RMRS-P-66. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 152–157.

Friskics, S. 2008. The twofold myth of pristine wilderness: Misreading the Wilderness Act in terms of purity. Environmental Ethics. 30(4): 381–399.

Grove, J.M.; Cadenasso, M.L.; Pickett, S.T.A. [et al.]. 2015. The Baltimore school of urban ecology: Space, scale, and time for the study of cities. Yale University Press.

Havlick, D. 2006. Reconsidering wilderness: Prospective ethics for nature, technology, and Society. Ethics, Place & Environment. 9(1): 47–62.

Hé Sapa Declaration 1. 2024. The 12th World Wilderness Congress. https://wild.org/wild12/resolutions/on-sovereignty-and-wilderness-deepening-the-wilderness-concept-through-indigenous-knowledge-and-wisdom/ [Accessed September 1 2025].

Kammer, S. 2013. Coming to terms with wilderness: The Wilderness Act and the problem of wildlife restoration. Environmental Law (2013): 83–124.

Kaye, R.; Persha, E.; Mucklow, D.; [et al.]. 2014. From the Neolithic to the Anthropocene: A short history and speculative future of wilderness as Human–Earth relationship. In: Fox, S.; Phillippe, C.; Hoover, V.; Lambert, L., eds. Celebrating the 50th Anniversary of the Wilderness Act. October 15–19, 2014. Albuquerque NM. Proceedings of the National Wilderness Conference Proceedings.

Kaye, R. 2018. The untrammeled wild and wilderness character in the Anthropocene. International Journal of Wilderness. 24(1): 8–16.

Keeling, P.M. 2007. Beyond symbolic value of wildness. International Journal of Wilderness. 13(1): 19–23.
Keeling, P. 2008. Does the idea of wilderness need a defence? Environmental Values. 17(4): 505–519.
Keeling, Paul. 2024. The trouble with virtual wilderness. International Journal of Wilderness, 30:1
Kelly, P; Landres, P. 2023. Does wilderness matter in the Anthropocene? Resolving a fundamental dilemma about the role of wilderness in 21st century conservation. Ethics, Policy & Environment. 26(3): 422–437.
Landres, P.; Barns, C.; Boutcher, S. [et al.]. 2015. Keeping it wild 2: An updated interagency strategy to monitor trends in wilderness character across the National Wilderness Preservation System. Gen. Tech. Rep. RMRS-GTR-340. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station. 114 p., 340.
Leopold, A. 1935. Why the Wilderness Society? Living Wilderness. 1: 6.
Leopold, A. 1949. A sand county almanac. New York: Ballantine.
Machlis, G.E.; Force, J.E.; Burch, W.R. Jr. 1997. The human ecosystem part I: The human ecosystem as an organizing concept in ecosystem management. Society & Natural Resources. 10(4): 347–367.
Marshall, R. 1954. As cited in Zahniser, H. 1956. The need for wilderness areas. Living Wilderness. 59: 37–43.
Marzluff, J.M.; Shulenberger, E.; Endlicher, W. [et al.]. 2008. An international perspective on the interaction between humans and nature. New York: Springer Books Ltd.
Morton, T. 2009. Ecology without nature: Rethinking environmental aesthetics. Harvard University Press.
Pickett, S.T.; Cadenasso, M.L.; Childers, D.L. [et al.]. 2016. Evolution and future of urban ecological science: Ecology in, of, and for the city. Ecosystem health and Sustainability. 2(7): p.e01229.
Plumwood, V. 1998. Wilderness skepticism and wilderness dualism. In: Callicott, J.B.; Nelson, M.P., eds. The great new wilderness debate. University of Georgia Press: 655.
Schuster, R.M.; Cordell, H.K.; Phillips, B. 2005. Understanding the cultural, existence, and bequest value of wilderness. International Journal of Wilderness. 11(3): 22–25.
Vogel, S. 2015. Thinking like a mall: Environmental philosophy after the end of nature. MIT Press.
Woods, M. 2017. Rethinking wilderness. Broadview Press.
Zahniser, H. 1956. The need for wilderness areas. In: Harvey, M. ed. The wilderness writings of Howard Zahniser. University of Washington Press: 127–137.
Zahniser, H. 1959. Letter to Edward Graves, April 25. In: Harvey, M. ed. The wilderness writings of Howard Zahniser. University of Washington Press: 160–161.
Zahniser, Howard. 1963. Wildlands, a part of man's environment. In: Harvey, M. ed. The wilderness writings of Howard Zahniser. University of Washington Press: 181.

Encountering Antarctic Wilderness:
Rethinking Relationships, Values, and Rights (Panel Summary)

BY YU-FAI LEUNG, COURTNEY HOTCHKISS, CORMAC CULLINAN, LINDA SHEEHAN, DANIELLE (DANII) KEHLER, and ROBERTA BOSU

Abstract

Wilderness values and the Rights of Nature are two concepts commonly used in conservation and environmental law that are in the process of being defined and operationalized. In a panel entitled Encountering Antarctic Wilderness: Rethinking Relationship, Values, and Rights, Antarctica was discussed as a unique opportunity to develop new and evolved approaches to protection and legal rights. This commentary provides a brief overview of the panel presentations, audience feedback, and recommendations for future research.

Background

Billed as the Last Frontier, the Antarctic continent is commonly described as a gigantic wilderness in early explorers' journals and popular writings since then. Antarctic wilderness is often assumed to be understood, appreciated, and valued. Indeed, the 1991 Environmental Protocol to the Antarctic Treaty (i.e., Madrid Protocol) emphasizes the need to protect the continent's wilderness values and wilderness significance. Surprisingly, the values and significance of Antarctic wilderness have been mentioned but not been clearly defined in the official meetings and other guidance documents within the Antarctic Treaty System (ATS), which was formed in 1959 to promote peace and science on the white continent.

In the past few decades, scholars have explored Antarctica's wilderness values from different perspectives and they seem to agree that as tourism, scientific activity, and climate change impacts increase there is an urgency to better identify and monitor wilderness values in order to protect and preserve critical geophysical processes, biodiversity, and landscapes contained within the last wild frontier on Earth (Hogg et al. 2020; Tin et al. 2008; Summerson 2012). Western scientific research in Antarctica has been taking place for decades and ongoing research related to governance, climate change, and tourism has been prioritized in recent years (Orheim 2013). As efforts to build a framework for the Rights of Antarctica continue, protective policies need to be enacted as soon

Yu-Fai Leung *is professor at North Carolina State University. He specializes in monitoring and management solutions for sustainable recreation and tourism in protected and natural areas. Email: leung@ncsu.edu* ***Courtney Hotchkiss*** *is at North Carolina State University. Email: chotchk@ncsu.edu.* ***Cormac Cullinan*** *is Executive Director of the Wild Law Institute. Email: Cormac@greencounsel.co.za.* ***Linda Sheehan*** *is at Environment Now. Email: lsheehan@environmentnow.org.* ***Danielle (Danii) Kehler*** *is Plains Cree from the Kawacatoose First Nation on Treaty 4 territory in Canada, and is an Indigenous Artist & a Consultant for The Office of the Treaty Commissioner. Email: daniikehler@gmail.com.* ***Roberta Bosu*** *is at Antarctic Rights and Global Alliance for the Rights of Nature. Email: antarcticrights@garn.org*

as possible with the best available science and knowledge. Coalescing information from multiple disciplines takes a lot of time, effort, funding and dedication from researchers and other stakeholders, but Antarctica and its oceans need protection now. However, there is an abundance of valuable knowledge and wisdom that can be used to guide protective measures immediately; these include the precautionary principle (Bastmeijier and Gilbert 2019), Indigenous knowledges (IPBES 2022), and respect for nature (McCormack et al. 2021).

The Panel

To stimulate dialogue on Antarctic wilderness, we organized a panel entitled *Encountering Antarctic Wilderness: Rethinking Relationship, Values, and Rights* at the 12th World Wilderness Congress (WILD12). The goals of the panel were to provide background on Antarctica as a unique opportunity to develop new and evolved approaches to protection and Rights of Nature, as well as to broaden the conversation on the concept of wilderness from different perspectives. The panelists–Danii Kehler, Cormac Cullinan, and Yu-Fai Leung–brought together their own knowledge and backgrounds to begin a conversation on wilderness values and the rights of Antarctica. The panel was moderated by Linda Sheehan and Courtney Hotchkiss. To encourage participation, we distributed a promotional postcard (Figure 1) at the WILD12 venue prior to the event. There were a total of 20 participants, including researchers (early career and established academics), practitioners, and Indigenous community members and leaders.

Figure 1a-b - Promotional postcard for the panel (a) front and (b) back (photo: Roberta Bosu).

Yu-Fai Leung is a professor at North Carolina State University who specializes in monitoring and management solutions for sustainable recreation and tourism in protected and natural areas (Figure 2). He is a co-principal investigator of ANT-MICI, which is an ongoing international collaborative project on Antarctic tourism (University of Groningen 2024). As part of ANT-MICI, his team examines diverse concepts and perspectives of Antarctic wilderness values, as well as translates this knowledge into measurable and mappable indicators to inform future monitoring efforts and policy discourse. In his talk, he articulated the need for better characterizations and tracking of Antarctic wilderness values, which are under increasing threats by climate change and expanding human activities. He briefly reviewed wilderness value concepts from the Antarctic and global literature and shared preliminary results from a systematic literature review as part of the research process.

Danii Kehler is Plains Cree from the Kawacatoose First Nation on Treaty 4 territory in Canada, and is an Indigenous artist and a consultant for The Office of the Treaty Commissioner. Danii was the "first" First Nations person from Canada to join the 2041 ClimateForce Antarctic Expedition in March 2022, becoming an Ambassador for the Antarctic and taking up the fight against climate change there. Prior to her current position, she was Manager of SevenGen, an Indigenous youth-led organization aimed at creating space for mobilizing Indigenous youth. During the panel, Danii described her connection with and journey to Antarctica, emphasizing how the continent is the "keystone" of the entire world. However, Antarctica does not need human help; "Mother Earth is saying we need to save ourselves, not save her. We need to change ourselves."

Figure 2 - Panelists (left to right) Yu-Fai Leung, Danii Kehler, and Cormac Cullinan (photo: Courtney Hotchkiss).

Cormac Cullinan, Executive Director of the Cape Town, South Africa-based Wild Law Institute, gave a presentation on the Rights of Antarctica. He explained that because Antarctica is not a State, it does not have a voice in the decision-making processes that affect it; the ATS cannot address threats like climate change, which is mainly caused by human activities that take place outside the treaty area; the repeated failures of ATS States to reach consensus prevents adoption of important measures. An Antarctic Alliance was launched to finalize and adopt a Declaration that recognizes Antarctica as a unique legal entity under international law with inherent rights and to develop practical means of representing and advancing Antarctica's best interests.

Discussion

Towards the beginning of the panel presentations, members of the audience were asked the question: "What comes to mind when you think of the wilderness values of Antarctica?" Their responses were used to generate a word cloud for Antarctica Wilderness Values (Figure 3). The question was intentionally asked towards the beginning of the presentations to allow the audience to be less influenced by research findings and other perspectives presented later. However, themes of responses that emerged after the panel and during the open-ended questions session were similar to those that emerged earlier. More than three-quarters of the responses about wilderness values in Antarctica centered on the importance of protecting the environment (e.g. ecological functions, wilderness, biodiversity) and the absence of humans (e.g. remote, pristine, undeveloped). Few responses were considered to be anthropocentric, but the responses tended to reference coexistence (holistic protection, love and spiritual connection, sacred south). Two specific species were mentioned: penguins and krill.

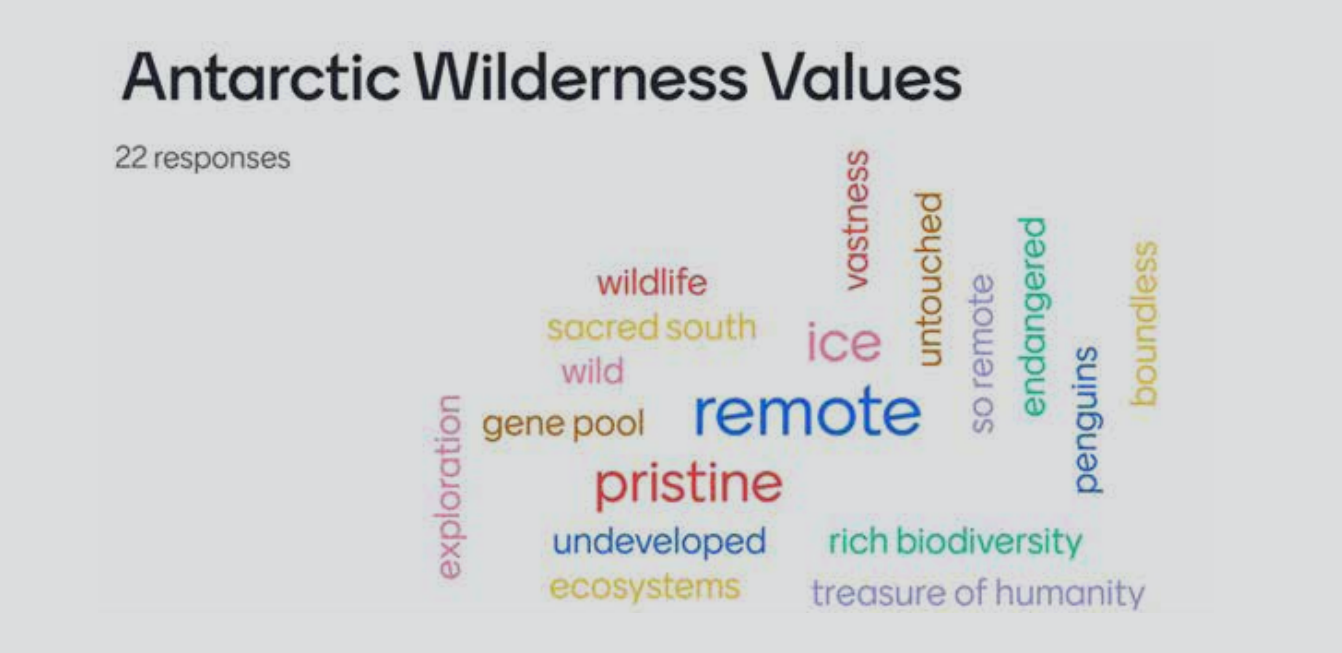


Figure 3 - Towards the beginning of the panel presentations, a live word cloud was created using a QR code generated in the program Mentimeter where members of the audience entered responses to the question "What comes to mind when you think of the wilderness values of Antarctica?"

Participants in the audience expressed concerns about terminology. Hesitancy with using existing language was raised, potentially perpetuating assumptions of power embedded in language. For example, the term "state" could have unintended consequences, empowering the wrong people or providing a basis for justifying behavior. Furthermore, a participant mentioned that some terms have evolved and are no longer sufficient or accurate. For example, wilderness and wilderness areas do not encompass intrinsic and spiritual values; this participant suggested replacing them with the phrase "sacred places" to honor and elevate respect for the place and for the environment. One participant mentioned that Indigenous perspectives emphasize interconnectedness and systems thinking, stating that "the Arctic is the head, and Antarctica is the feet; it is the foundation of the body", and "reciprocity, respect, responsibility; these are ecological values".

Referring to the feasibility of introducing a framework of the Rights of Nature, one participant suggested starting on a smaller scale, such as focusing on the rights of a certain species. At the same time, Indigenous perspectives brought clear messages about the Earth as one system and the need for more holistic management. Several participants mentioned that nature has inherent rights, and that Antarctica is the foundation of every life on Earth.

Reflections

Feedback for the rights of Antarctica centered on two main topics: attention to terminology and respect for the environment. Conversations about the term "wilderness" and its various management approaches have been argued to be inadequate in addressing climate change impacts and resource demands (McCormack et al. 2021). A paradigm shift in theory and practice related to conservation in Antarctica and around the world means acknowledging the inherent value of nature and understanding that humans are a part of the environment. Using the same systems and approaches isn't enough; learning from Indigenous communities will help Western scientists expand their perspective and realize the knowledge and wisdom that is already there.

The Antarctic Rights initiative falls under a broader movement for Earth Jurisprudence (Cullinan 2011) and the Rights of Nature (Global Alliance for the Rights for Nature, n.d.). One approach for the Rights of Antarctica would be that voting members at the annual Antarctic Treaty Consultative Meeting approve a working group or create an organization that could serve as a consultative party representing the legal rights of Antarctica, but it will be a long road to reach consensus among the existing consultative parties. For now, we hope that the new working group focused on the development of a management framework for Antarctic tourism will take action to monitor and regulate tourism activities, part of which will be to describe and protect wilderness values and significance.

Resolution 3 *Advancing the Rights of Antarctica* was amended and approved during WILD 12, indicating broader Antarctic support from the participants at the WILD12 conference. The Resolution will be presented at the 2025 IUCN World Conservation Congress in Abu Dhabi, United Arab Emirates in October 2025. In the meantime, Indigenous-led approaches to conservation, as well as implementing the precautionary principle with existing knowledge and wisdom, will pave a new way of protecting, valuing, and respecting the white continent.

References

Bastmeijer, K.; Gilbert, N. 2019. Discussion document for the International Workshop on Antarctic Tourism Rotterdam, 3-5 April 2019. Antarctica Treaty Consultative Meeting XLL, Czech Republic, IP26.

Cullinan, C. 2011. Wild Law: A manifesto for Earth Justice. 2nd ed. Devon, UK: Green Books.

Global Alliance for the Rights for Nature [N.d.] What are the Rights of Nature? https://www.garn.org/rights-of-nature/ [Accessed 2025 July 15]

Hogg, C.J.; Lea, M.-A.; Gual Soler, M. [et al.] 2020. Protect the Antarctic Peninsula—before it's too late. Nature. 586 (7830).

IPBES. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. 2022. Summary for policymakers of the methodological assessment regarding the diverse conceptualization of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services (assessment of the diverse values and valuation of nature). Pascual, U.; Balvanera, P.; Christie, M. [et al.], eds. IPBES secretariat, Bonn, Germany. Doi:10.5281/zenodo.6522392

McCormack, P.C.; Richardson, B.J.; Takacs, D. [et al.]. 2021. Wilderness law in the Anthropocene: Pragmatism and purism. Environmental Law. 51(2): 383–435. https://www.jstor.org/stable/27027145

Orheim, O. 2013. Managing the frozen commons. In: Walton, D.W.H. ed. Antarctica: Global science from a frozen continent. 1st ed. Cambridge University Press.

Summerson, R. 2012. Protection of wilderness and aesthetic values in Antarctica. In: Huettmann, F. ed. Protection of the Three Poles. Springer, Tokyo. doi:10.1007/978-4-431-54006-9_4

Tin, T.; Hemmings, A.D.; Roura, R. (2008). Pressures on the wilderness values of the Antarctic continent. International Journal of Wilderness. 14 (3). https://wild.org/wp-content/uploads/2009/04/ijwdec08_tin.pdf

University of Groningen. 2024. ANTI-MICI. https://www.rug.nl/research/arctisch-centrum/projects/pt-repair/ant-mici/?lang=en. [Accessed 2025 July 15].

The Universal Values of Wilderness? (Panel Summary)

BY CHRIS DUNN, ARTHUR OBST, and LINDE De VROEY

Abstract

This panel discussion considered whether and in what ways wilderness values might be shared across culture and geography. Wilderness protection in the American setting is specifically contextualized by increasing human population, settlement, and mechanization. Since the passage of the U.S. Wilderness Act, these same trends have accelerated across the globe thus perhaps simultaneously globalizing the need and desire for wildlands protection. This discussion centered on the prospect that there is a deep-seated human need for wild places that transcends time and culture, interrogated as a question: Is there a common conscious, universal need for wild places? Panelists and participants brought North and South American, European, and African perspectives to the discussions.

Background

The following is a summation of the themes of a panel presentation and discussion held at WILD 12 on August 29, 2024, in Rapid City, South Dakota, though enriched and expanded for the purposes of this paper. This panel discussion considered whether and in what ways wilderness values might be shared across culture and geography. Wilderness protection in the American setting is specifically contextualized by increasing human population, settlement, and mechanization. Since the passage of the U.S. Wilderness Act in 1964, these same trends have accelerated across the globe thus perhaps simultaneously globalizing the need and desire for wildlands protection. This discussion centered on the prospect that there is a deep-seated human need for wild places that transcends time and culture, interrogated as a question: Is there a common conscious, universal need for wild places?

To begin, it is important to recognize the obvious: wilderness is a word—an English word. But it has an underlying meaning. And though this word was not historically shared, perhaps aspects of this meaning were. This word brought attendees together at WILD12, so in that sense it has now become a shared term. Beginning with

Dr. Chris Dunn *is the lead author of the article and the panel moderator. He is a researcher, writer, photographer, adventurer, and instructor of Environmental Studies at the University of California-San Diego. ORCID: 0000-0003-3553-3977. Email: christopher.dunn@fulbrightmail.org* ***Dr. Arthur Obst,*** *Postdoctoral Associate at the Climate Systems Engineering initiative at the University of Chicago. ORCID: 0000-0002-0616-4132. Email: arthurobst03@gmail.com* ***Linde De Vroey,*** *Senior Researcher at the University of Antwerp. ORCID: 0000-0001-9192-7730. Email: linde.devroey@uantwerpen.be With additional contributions from:* ***Jo Roberts,*** *CEO of the UK Wilderness Foundation. Email: jo.roberts@wildernessfoundation.org.uk* ***Yose Cormier,*** *Communications Specialist at Parks Canada. Email: yose.cormier@canada.ca* ***Dan Abbe,*** *retired Wilderness Specialist at the Arthur Carhart National Wilderness Training Center.*

this basic acknowledgement, key questions uniting this panel were: Why does wilderness matter to us and does it matter to everyone? In what widely shared ways does it matter? If there is a universal dimension of wilderness, what is it about us that underlies this?

One plausible answer to the latter, assuming—for now—that there may be such a shared value, comes from evolutionary psychology: wilderness is the sort of ancestral environment in which we (all humans) evolved (e.g., Sampson 2012). Agrarian settlements, much less industrial modernity, are a temporal afterthought in our evolutionary history. We have been shaped by and are adapted to such undeveloped, unconfined environments even if many may now be alienated from, forgetful, or even fearful of wilderness. This thesis is reflected in E.O. Wilson's biophilia (1986).

And if there are universally shared wilderness values, what sorts of values are these? These could include healthy environments with clean air and water that are conducive to the health of our bodies, silence and solitude and space for undistracted reflection on ourselves and our place in the world, beauty and adventure, freedom from everyday social constraint, challenge and discipline, and companionship with our fellows—both human and non-human. This panel, in conversation with attendees, considered these and others. The intent of the session was to create dialogue, broaden understanding, and gauge interest in further exploration, research, and publication on this topic.

The Panel

The session began with a series of short presentations by six panelists—Esteban Barriga, Linde De Vroey, Jo Roberts, Dr. Arthur Obst, Yose Cormier, and Dr. Chris Dunn (see Author Notes at the end). Chris Dunn moderated the panel and discussion. This was an eclectic panel and a wide range of topics and questions were explored in conversation with attendees, centering around the question: "Is there a common conscious, universal need for wild places?"

This proceedings summation includes a series of arguments and reflections that generally affirm the universality of wilderness, while acknowledging the pitfalls and risks that such an idea presents. It begins with an argument by Chris Dunn that engages with the longstanding Great Wilderness Debate (see e.g., Callicott and Nelson 1991; Nelson and Callicott 2008) but singling out and refuting an argument against wilderness that is often repeated but often neglected in its own right, namely that there is an insurmountable chasm between so-called Indigenous and Western perspectives on land and nature. This assessment continues with Arthur Obst who affirms the universality of wilderness by grounding wilderness values in humility, asserting that wilderness, properly understood and implemented as a practical conservation project, is inherently liberatory and respects local socio-cultural lifeways. Linde De Vroey offers an exploration of wilderness values in the context of differing conceptions of rewilding between Europe and North America, centering on a wildness vs wilderness approach. However, it is not clear that this commonly repeated bifurcation truly captures a break in ideas of wilderness and rewilding. Finally, Esteban Barriga offers insights on Ecuador's ancestral knowledge and the power of youth in territorial resistance; Yose Cormier briefly offers the possibility that love of nature is a fundamental universal value of wilderness, while Jo Roberts briefly offers her experiences between the UK and South Africa in the context of wilderness therapy highlighting the healing dimension of wild nature as a basis for shared values between these regions and perhaps beyond.

Philosophical Considerations

Chris Dunn opened the session with an examination of the compatibility between Indigenous and nonindigenous conceptions of wilderness. This argument forms the core of a forthcoming paper. One challenge to the idea of any universal value(s) of wilderness comes from the longstanding wilderness debate (see e.g., Callicott and Nelson 1991; Nelson and Callicott 2008; Sutter 2009; Woods 2017). Wilderness has received a variety of critiques over the last several decades. One in particular is often nested within others and so has escaped substantial treatment on its own terms. This is the *Incompatibility Critique of Wilderness*. The discrepancy in question is between Indigenous and "western"—though by the latter in this case, this refers specifically to the (mainly) American wilderness philosophy underlying wilderness protection—understandings of wild or undeveloped nature. *Western* is here placed in quotation marks as this is how it is commonly labeled, but there is in fact no homogenous "western" view. Wilderness philosophy is a subversive tradition in that it pushes against dominant tendencies in the west (though by no means exclusively here) of dominating and exploiting nature.

This critique is often alluded to in the supposition that "Indigenous people had no word for wilderness", implying that wilderness is a culturally limited, foreign imposition. This specific phrasing was, for instance repeated throughout WILD12 in various capacities, heard by the lead author at multiple presentations by Indigenous speakers or on Indigenous topics, and further professed by a confused and disheartened retired wilderness manager who approached the lead author seeking clarity on this line that he too claimed to have heard repeatedly. Now former director of the U.S. National Park Service, Chuck Sams, who spoke at WILD12 while still in this role, has formerly stated that Indigenous people had no word for "wild" and called wilderness a "fallacy" (Oaster 2022). Perhaps the original statement of such a rift comes from this famous and oft reproduced quote by Chief Luther Standing Bear (1933: 38):

We did not think of the great open plains, the beautiful rolling hills, and winding streams with tangled growth, as 'wild'. Only to the white man was nature a 'wilderness' and only to him was the land 'infested' with 'wild' animals and 'savage' people. To us it was tame.

At first blush, this seems like a damning indictment. However, philosopher Mark Woods (2017: 199) affirms the assessment of Jay Hansford Vest, a Monacan Indian, "that Standing Bear has been misinterpreted":

For Standing Bear, the terms 'wild' and 'wilderness' are pejorative terms from
Euro-Americans that were applied to American Indian lands and American Indians themselves. These pejorative terms deny 'the intrinsic value accorded [to] nature in his Native worldview'. Vest (2010: 83) goes on to discuss the fact that many Native Peoples in North America did have an understanding of what we today call wilderness in terms of self-willed land and regarded such land in terms that we would call intrinsic value today.

Philosopher Levi Tenen (2025) likewise argues that:

Elsewhere in the same essay, Standing Bear notes that 'The Indian and the white man sense things differently because the white man has put distance between himself and nature'…He then describes the level of awareness that Lakota boys had: 'Sometimes we boys would sit motionless and watch the swallow, the tiny ants, or perhaps some small animal at its work…or we lay on our backs and looked long at the sky and when the stars came out made shapes from the various groups.' In his view, such experiences led to a special, ecological awareness. The Lakota held that 'animals had rights', that there was 'kinship with all creatures' and that 'everything"—'the flowers, winds, rocks, trees, birds, and animals'—had the same 'great unifying life force'. By contrast, the 'white man' did not seek 'harmony' with nature but rather 'sought the dominance of surroundings'.

This sounds like a description of the wilderness experience, what Tenen calls a wilderness aesthetic, at a time when Euro-Americans had not yet learned to appreciate it. Tenen thus concludes that "while anti-wilderness writers often use Standing Bear's claims to criticize wilderness, his statements may actually lend some support for wilderness. For, the designation is designed to allow visitors to appreciate and connect with landscapes in a manner reminiscent of traditional forms of engagement" (and—it should be added—in a nondominating way).

Further, this quite shallow observation (that Indigenous people had no word for wilderness) is first, arguably untrue. For instance, one clear counterexample (that is, an example of an Indigenous conception that clearly resembles wilderness—at least certain conceptualizations of wilderness) is from the Mayan (K'iche) *Popul Vuh*:

The [*Popol Vuh*] asserts that the animals are the 'guardians of the forest, and all that populate the mountains', protectors of the wildness of the natural world in opposition to human attempts to cultivate the land on behalf of maize. The present age is seen as an endless struggle between the denizens of the forest as guardians of wild plants that grow spontaneously, and the tamed fields of humans that require their constant attention to produce a harvest (Christensen 2016: 98).

And second, this observation (that Indigenous people had no word for wilderness) ignores the specific contextualization out of which wilderness—as a form of formal protection and in its contemporary meaning—emerged. This context, never before seen on earth prior to the rise of the wilderness movement, was one of widespread and increasing mechanization, population, and domination—resolving into the foreground that which had always been a taken-for-granted background: large, intact ecosystems and landscapes that often accommodated pre-industrial levels of human use and population. Such places began to be recognized as increasingly rare—shining forth as the exception rather than the rule—thereby calling for deliberate policy action and a way of speaking about what was being lost. Wilderness is in this sense a new–old idea. In this contemporary meaning of deliberate protection within a context of potential total loss, wilderness was arguably a word which even western people lacked. This observation that indigenous people had no word for wilderness, even if true, thus does nothing to undermine the validity and efficacy of wilderness. New words, new uses of words, and new ethical realizations (including "ecosystem" and "biodiversity" and "human rights"—it is noteworthy, for instance, that Indigenous people had no word for "Indigenous rights") emerge all the time, rightfully.

This overarching incompatibility critique is further rebutted by examining the charges leveled by critics in comparison to what precisely wilderness advocates such as Bob Marshall, Olaus Murie, and Edward Abbey, and proto-wilderness thinkers such as H.D. Thoreau and John Muir actually wrote, showing that critics misunderstand and so misrepresent wilderness thought and that the *Incompatibility Critique* is therefore largely mistaken. This does not however imply equivalency between Indigenous and nonindigenous conceptions of nonhuman nature, though there is marked and substantial overlap (Dunn 2024). It is important to note that this argument focuses on conceptualizations and relations, rather than on issues of sovereignty and land rights.

As interpreted by some, there is an insurmountable conflict between Indigenous ideas of nature and non-, including wilderness, which these critics interpret as a paradigmatic example of nature apart from culture. It is commonly stated that there are various conceptual schisms between Indigenous and Western conceptions of nature and the human place in it. Three main cleavages are most often mentioned: 1) Dual vs Nondual Incompatibility, 2) Ontological Incompatibility, and 3) Sacral Incompatibility. Each is refuted through close textual analysis of the original statements by various relevant authors.

1) Dual vs Nondual Incompatibility—This sub-argument maintains that western wilderness conceptualizations are dualistic while Indigenous conceptions are not. Historian William Cronon is perhaps the most famous to offer such a critique when he writes in *The Trouble with Wilderness; or, Getting Back to the Wrong Nature* that "wilderness embodies a dualistic vision in which the human is entirely outside the natural" (Cronon 1996). Many others have offered similar points. These critiques are however not supported by the literature, the writings of wilderness (and proto-wilderness) thinkers and writers, that is. From Henry David Thoreau to John Muir to Aldo Leopold to Bob Marshal to Howard Zahniser, we find an overriding common theme: a belief of, and an aspiration to experience, a sense of unity between nature and ourselves. The important point is that wilderness, like many Indigenous cultures, represents a non-dominating, non-human-exceptionalist (in the sense that humans are entirely unique from the rest of nature in such a way as to justify domination of nonhuman nature) view of the relationship of humans and nature.

2) Ontological Incompatibility—This sub-argument maintains that the ultimate conceptual underpinnings of wilderness are inherently incompatible with Indigenous conceptions. It maintains that wilderness is founded upon western scientific materialism, whereas Indigenous conceptions are animistic or relational. This however confuses wilderness thought and the intentions of the framers of the Wilderness Act with agency implementation and scientific management.

3) Sacral Incompatibility, which maintains that conceptualizations of the sacred, specifically in relation to substantially undeveloped land or water, are misaligned. Close textual analysis reveals however that each of these is based on a distortion of the wilderness idea and wilderness movement; in fact, there are ample shared conceptualizations of the nonhuman world between Indigenous and nonindigenous peoples concerned with the flourishing of the world's least developed regions.

In sum, the claim that Indigenous conceptions of place and ideas of wilderness are conceptually at odds is unsubstantiated. While this analysis (a punctuated summary of a longer argument) presented here is primarily focused on the U.S., it could and should be broadened to a global context. A revealing, concluding thought comes from Chief Dan-na-wuk, a Chilkat (Tlingit) elder, as recounted by John Muir. Muir—as flawed as he may have been—in including this in his writing, seemed to conceive of his own ecstatic, animistic view of mountains, glacier, forests, and rivers, as kin to those of at least some of the Native Peoples he encountered, and—if faithfully recounted—at least one such individual reciprocated:

It has always seemed to me that while trying to speak to traders and those seeking gold mines that it was like speaking to a person across a broad stream that was running over fast stones and making so loud a noise that scarce a single word could be heard. But now, for the first time, the Indian and the white man are on the same side of the river (Muir 2015 [1915]; Cruikshank 2007).

Arthur Obst, postdoctoral associate at the University of Chicago, continued with the thread of philosophically affirming the possibility of the universality of wilderness value(s). One powerful argument supporting this possibility is ethical in kind (Obst 2023). Just as human rights are understood to be universal and have been institutionalized as such through the United Nations (1949) Universal Declaration of Human Rights, so perhaps wilderness might also be universal. One way of making this case is by appealing to humility. Insofar as humility

is a grounding principle of ethical pluralism, universal wilderness preservation—when construed and executed properly—need not conflict with respect for the wide range of international cultures or their self-determination. On the contrary, respecting wilderness and respecting global human diversity should be seen as two rivers flowing from the same source. Therefore, one cannot plug or poison the headwaters of wilderness without cutting off the flow of universal tolerance. In this sense, wilderness *has* universal value.

There are two especially relevant types of humility, each of which in different ways justifies wilderness preservation and human diversity alike. Practical humility is based on the realization of the world's uncontrollable vitality— its wildness or freedom—and the limits of our powers of prediction and control. Recent history provides countless examples of human attempts to control ecological outcomes resulting in harmful unintended effects, whether the extirpation of predators devastating ecosystems, straightening waterways triggering flooding and erosion, or the wide use of pesticides poisoning human and non-human communities alike. Wilderness preservation, understood as the protection of relatively self-regulated land and waters, might be seen as a bulwark against such adverse consequences of human intervention—a hedge and a precaution taken by the humble (Obst 2023).

Importantly, however, this very same attitude should require taking a pause before dictating the conduct, character, or cultures of another. This holds double for one person or place controlling whole communities or cultures that are not their own. The "father of Wilderness", Aldo Leopold, certainly believed so. In his famous "Land Ethic", Leopold (1986) wrote:

In human history, we have learned (I hope) that the conqueror role is eventually self-defeating. Why? Because it is implicit in such a role that the conqueror knows, ex cathedra, just what makes the community clock tick, and just what and who is valuable, and what and who is worthless, in community life. It always turns out that he knows neither, and this is why his conquests eventually defeat themselves. In the biotic community, a parallel situation exists.

This beautiful articulation of what Arthur calls practical humility has an explicit moral lesson: that *homo sapiens* should reimagine their role from *conquerors* of the land community to plain members and citizens of it. This wisdom demands the emancipation of humans and wilderness alike. It applies as much to one human as another and dispels the conqueror role in *all* domains: ecological and social, wild and cultural. In this way, it is universal.

A second type of humility is moral in kind, and it can come in different forms: first, based on a recognition that the wild world improves our character and well-being; second, based on a recognition that we are only one of a multitude of species that ought also to be allowed to flourish; and finally, the recognition that sometimes we are wrong about what is truly good and thus ought to be open to being shaped by that which exceeds our known preferences and desires (Obst 2023). The resonance of moral humility in the human sphere should, hopefully, be clear. Even if a single human— the conqueror— could *succeed* in determining the affairs of the rest, they *shouldn't* because a world forged by the mind of one would be impoverished. Lacking in this (dystopic) world would be a vast range of eclectic and effervescent values that the conqueror cannot imagine or appreciate. Likewise for wilderness, as a synthetic world built by one conquering species would be profoundly impoverished in just the same way. Hence, the attitude of moral humility that justifies us embracing value pluralism and intercultural learning also recommends wilderness preservation.

Hence, wilderness preservation need not expunge cultural diversity and local eco-social relationships. On the contrary, a wilderness ethic— when construed and executed properly in accordance with its *liberatory* meaning— should enshrine human diversity and place-based cultures as much as biological diversity and community ecology. This, of course, is not to suppose that wilderness always has or always will be implemented in this way. On the contrary, wilderness preservation has at times resulted in various injustices, creating an open, unhealed wound. And it is precisely this history of "wild concepts" used as instruments of dispossession and domination that has led some Indigenous thinkers to reject their desirability or relevance to contemporary conservation (Whyte 2024). However, this history also teaches why rooting the value of the wild in humility— an outlook with a long history in the American wilderness movement— is so important.

Yose Cormier, Communications Specialist at Parks Canada, also affirmed the prospects of the universality of wilderness, by presenting on a shared movement—an IUCN global initiative, #NatureForAll. Core to this initiative is the universality of love of nature. #NatureForAll is based on the recognition that humans *are* nature, not separate from it. It recognizes that all humans have a deep-seated connection to nature. Though for many people, this connection has been broken, it can be repaired by falling in love with nature because love leads us to care and take positive action. #NatureForAll was formally launched in 2016 at the IUCN World Conservation Congress. Over 600 partners from more than 80 countries drive the #NatureForAll movement every day. These organizations are extremely diverse in terms of size, geography, and also what they do. Some are focused on a specific conservation effort, others are focused on giving youth a voice, while others are focused on health, on education, or even sustainable development. Some are large, global initiatives while others are simply one person trying to do their part locally. But they all share a common value—connection with nature leads to action for nature.

Perspectives Across Culture and Geography

#NatureForAll incorporates a presumption of universality through the integration of love of nature and biophilia—the human tendency to interact or be closely associated with other forms of life in nature (Wilson 2017). At the same time, the panel highlighted that biophilia manifests with many geographical–cultural variations. From Ecuador, Esteban Barriga, a young environmental leader and a contributor to #NatureForAll (2024) shared with the audience his engagement with nature—in urban areas and in the Amazon—and with people—young and old. For Esteban, ancestral knowledge and the power of youth in territorial resistance are central to his engagements in rewilding nature and ourselves.

Linde De Vroey, a Ph.D. researcher at the Center for European Philosophy of the University of Antwerp in Belgium, continued this comparative discussion, addressing the universality of wilderness by considering transatlantic approaches to rewilding, outlining the history of the rewilding concept from its emergence in North America in the 1990s to its heterogeneity of approaches in the present international context. Shifting the focus to European rewilding, Linde notes the acclaimed difference between European and North American rewilding: many European rewilders have taken their distance–at least in theory–from rewilding's North American origins in wilderness conservation. Linde's presentation stressed some of the European interpretations of rewilding, which in Europe is (at least in discourse) mostly centered around wildness instead of wilderness.

European rewilding generally claims to take a "historical" approach, following a "pastoral" or "peopled" baseline, and centering "wildness" as its central value. This approach is often pitched in sharp contrast to the North American approach of rewilding, which is closely associated with wilderness conservation; it emerged in the 1990s and is allegedly still chasing "primitive", "unpeopled" and "a-historical" wilderness (De Vroey and

Obst 2025). A perceived benefit to focusing on wildness instead of wilderness (at least in discourse) is that rewilding may be more positively perceived, evading critiques of wilderness as a dualistic and colonial concept. This, however, does not mean wilderness values are not prevalent as an undercurrent in European rewilding—making European rewilding vulnerable to wilderness critiques, but also proving its potential to carry on the positive value of wilderness (De Vroey and Obst, this proceedings). Linde's presentation raised the question of whether there is in fact a substantial geographical–cultural foundation to conceptualize rewilding differently between the continents—a conceptualization which challenges the universal value of rewilding.

From rewilding nature to ourselves, Jo Roberts, the CEO of the UK Wilderness Foundation, shared with the audience her experience of engaging with groups and individuals therapeutically in wildland settings and the positive human developmental and therapeutic outcomes from engaging with the wild. South African by birth, Jo has enjoyed a rich life of wild places in many parts of Africa as she grew up. From this early formative and experiential engagement of wilderness immersion and therapy in Africa, she developed a "wilderness framework", which she has been using to help young people and other clients engage with (closely) true wilderness experience in the UK (Roberts et al. 2016); this is not without challenges not least because of the absence of designated wilderness areas in the UK. Similar to #NatureForAll, wilderness therapy incorporates a presumption of universality through guiding participants to discover a wilderness mindset in which nature and humanity are interrelated and connected and not separate. Wilderness experiences often have positive effects on participants, improving mental wellbeing, including self-image, self-esteem, depression, anxiety, and related issues (see e.g., Barton et al. 2016, Tucker et al. 2022). The quest for attachment and the discovery of the attachment to wild nature leads to demonstrable human wellbeing improvements, galvanizing support for the protection of the last wild spaces on a crowded planet.

Discussion

Why is wilderness sometimes considered a harmful or disputed term, often especially by Indigenous Peoples? Why also, if wilderness embodies humility and can be justified ethically, has wilderness preservation at times resulted in various injustices, creating an open, unhealed wound? Given the homogeneous representation of rewilding across Europe, what exactly are rewilders trying to achieve or restore in each specific place and situation? These are only a few of the questions that could be addressed during the session due to time limitations. Many more pertaining to the question of the universality of the values of wilderness remain to be engaged with. Building upon Chris' observation of the absence of an irreconcilable division between Indigenous and nonindigenous conceptions of the nonhuman in the U.S., Arthur's take on humility as a universal wilderness values was considered to be a potential cornerstone for responding to some of these questions.

If wilderness represents and embodies humility, including humility of management and of restraining ourselves from dominating and developing certain areas, then what is needed is also humility of implementation. In this way, historical examples of colonial wilderness are not only unethical on independent humanitarian grounds but also stand antithetical to the moral heart of wilderness itself. Similarly, this humility—in management, in self-restraint, and in implementation—could also be applied to rewilding, whether in Europe or across the Atlantic, or beyond, addressing Linde's concerns of the risks of unilaterally imposing universal values on local situations. Rewilding should ideally be informed by a mixture of specific local and place-based ideas of the landscape on the one hand, and by the positive universal values of wild(er)ness (that Chris and Arthur stressed in their

presentations) on the other. Linde also argued for a biocultural approach; this can help rewilders to integrate some of the universal wilderness values in specific local contexts, without totally supplanting the specific local cultural relationships to the landscape and place, thereby reconciling global wilderness values with local perspectives. Ultimately, no matter whether rewilders value wildness or wilderness more, the basic question comes down to this: what exactly is rewilding trying to achieve or restore in this specific place and situation?

Further Questions

The intent of this session was to create dialogue and gauge interest in further research around the universal values of wilderness. During the session, many questions were raised but very few could be addressed due to time constraints. In addition to the rich exchanges and connections that were made during the session, the following questions—many multi-layered and interdisciplinary—form an important part of the session outcome. They serve as beacons pointing the way forward to inform further research and dialogue:

- Does wilderness have universal value?
- What specific values associated with wilderness are universal? E.g., clean air, silence?
- When should wilderness preservation outweigh other land-use demands, if ever? Can the two co-exist if we assert that humans are indeed "part of nature" and not separate from nature?
- Does wilderness as a word have too much political baggage to make it universally useful?
- Many have pointed out that many languages have no word for 'wild'? Is this a problem for the thesis that wilderness has universal value and (hence) meaning?
- Can one achieve the same levels of attachment and connectivity to nature in a park in a town as in a designated wilderness. What is different or the same? And why?
- More than half of the world's population live in urban areas now. What impact does this have on wilderness values?
- Probably everyone who attended and participated in this panel are wilderness advocates. What limitations does this create for this discussion?
- If wilderness has universal value(s), how do we account for those who seem indifferent to wilderness?
- Epistemological question: how do we know if wilderness has universal values? This raises philosophical-anthropological issues of cultural relativism and historicism or conversely of biologism or ontologizing.
- Ethical/pragmatic question: What dangers might we fall into in assuming or discounting potential universal values?
- In some countries and cultures, the idea of wilderness evokes fear and danger, not peace and tranquility. As conservationists and environmentalists, are we doing a good enough job to acknowledge that and to work towards changing that?
- Are universal concepts and meanings of "wilderness" and "wildness" reconcilable with more local, place-based relationships to place and meanings of land? If so, how can wilderness concepts be adapted locally to include these place-based meanings and relationships?
- In spite of the critiques of wilderness as an "ahistorical" concept (Cronon, 1996), can we think of a wilderness concept that is historically grounded? And if so, can this concept still be universal or have universal value?
- How can conservationists emphasize wild(er)ness' critical and liberatory value more often (and is this necessary)?

Appendix: Presenter Notes

In order of presentation, this panel included:

- Dr. Chris Dunn, a researcher, writer, photographer, adventurer, and instructor of Environmental Studies at the University of California-San Diego, who discussed the compatibility between Indigenous and nonindigenous conceptions of wilderness.
- Esteban Barriga who offered insights on Ecuador's ancestral knowledge and the power of youth in territorial resistance to rewild ourselves. Esteban is an Ecuadorian environmental engineer with a master's in Social Innovation. He leads an urban reforestation project, coordinates the Quito Sin Minería youth movement, and advocates against mining in Indigenous Amazon territories, earning international recognition from the Food and Agriculture Organization and IUCN for his efforts.
- Linde De Vroey, PhD candidate at the University of Antwerp, who offered insights on shared and divergent values in the context of transatlantic rewilding.
- Jo Roberts, CEO of the UK Wilderness Foundation, who discussed the challenges of adapting lessons learned from wilderness immersion and therapy in South Africa to the UK.
- Dr. Arthur Obst Postdoctoral Associate at the Climate Systems Engineering initiative at the University of Chicago, who offered a moral case for universal wilderness value grounded in humility.
- Yose Cormier, Communications Specialist at Parks Canada, who discussed the IUCN's #NatureForAll initiative focusing on the theme of love for nature.

References

#NatureForAll. N.d. Home. https://natureforall.global/home/ [Accessed 2025 September 1].

#NatureForAll. 2024. Esteban Barriga, an environmental engineer with a master's degree in social innovation from Ecuador, and Nadine Spence, Parks Canada's Vice President of Indigenous Affairs and Cultural Heritage, take part in a "couch chat" in the #natureforall Youth Oasis at the World Wilderness Congress (Wild12). https://www.instagram.com/reel/C_QgvcAqmE-/ [Accessed 2025 September 1]

Barton, J.; Bragg, R.; Pretty, J.; [et al.]. 2016. The wilderness expedition: An effective life course intervention to improve young people's well-being and connectedness to nature. Journal of Experiential Education. 39(1): 59–72.

Callicott; J.B.; Nelson, M.P. 1991. The great new wilderness debate. Athens, GA: University of Georgia Press.

Christenson, A. 2016. "Who shall be a sustainer?': Maize and human mediation in the Maya Popol Vuh. In: Parham, J.; Westling, L., eds. A global history of literature and the environment. Cambridge University Press: 93–106.

Cronon, W. 1996. The trouble with wilderness: Or, getting back to the wrong nature. Environmental History. 1(1): 7–28.

Cruikshank, J., 2007. Do glaciers listen?: Local knowledge, colonial encounters, and social imagination. Vancouver, Canada: UBC Press.

De Vroey, L.; Obst, A. 2026. From wilderness to rewilding: Defending the "will-of-the-land" in the 21st century. In: Dvorak, R.; Tin, T.; Armatas, C.; Carver, S., comps. Global Gathering on Knowledge, Wisdom, and Ways of Knowing: Twelfth World Wilderness Congress symposium; 2024 25–31 August, Rapid City, South Dakota, USA. Proceedings RMRS-P-000. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain.

De Vroey, L.; Obst, A. 2025. Wilderness values in rewilding: Transatlantic perspectives. Environmental Values. 34(3). doi:10.1177/09632719241305719

Dunn, C. 2024. The unappreciated significance and source of meaning in wild landscapes: An Arctic case. Environmental Values. 33(6): 626–647.

Leopold, A., 1986. A sand county almanac: With essays on conservation from Round River. Ballantine Books.

Muir, J. 2015 [1915]. Travels in Alaska. Houghton Mifflin Harcourt.

Nelson, M.P.; Callicott, J.B. 2008. The wilderness debate rages on: Continuing the great new wilderness debate. Athens, GA: University of Georgia Press.

Oaster, B. Page last modified: 2022 November 1. From dominance to stewardship: Chuck Sams' Indigenous approach to the NPS. High Country News. 54:11. Paonia, CO. https://www.hcn.org/issues/54-11/indigenous-affairs-national-park-service-from-dominance-to-stewardship-chuck-sams-indigenous-approach-to-the-nps/. [Accessed 2025 September 15].

Obst, A.R. 2023. Wilderness for wildness: Saving the wild in a post-natural world. Seattle, WA: University of Washington. Ph.D. dissertation.

Obst, A.R. 2024. Moral reasoning in the climate crisis: A personal guide. Moral philosophy and politics. 11(2): 371–395.

Roberts, J.; Barton, J.; Wood, C. 2016. Wilderness and youth at risk: Approaches for positive behaviour change through the outdoors. In: Bragg, R.; Wood, C.; Pretty, J., eds. Green exercise: Linking nature, health and well-being. London: Routledge: 125–138.

Sampson, S.D., 2012. The topophilia hypothesis: Ecopsychology meets evolutionary psychology. In: Kahn Jr, P.H.; Hasbach, P. H., eds. Ecopsychology: Science, totems, and the technological species. Cambridge, MA: MIT Press: 23–53.

Standing Bear, Chief Luther. 1933. Land of the Spotted Eagle. Boston, MA: Houghton-Mifflin.

Sutter, P.S. 2009. Driven wild: How the fight against automobiles launched the modern wilderness movement. Seattle, WA: University of Washington Press.

Tenen, L. 2025. Justice and the wilderness aesthetic. In: Parsons, G.: Hettinger, N.; Shapshay, S., eds. Routledge handbook of nature and environmental aesthetics. Taylor and Francis.

Tucker, A.R.; Norton, C.L.; DeMille, S.; [et al.]. 2022. Wilderness therapy. In: Leffler, J.M.; Frazier, E.A., eds. Handbook of evidence-based day treatment programs for children and adolescents. Cham: Springer International Publishing: 375–393.

United Nations. General Assembly. 1949. Universal declaration of human rights. Vol. 3381. Department of State, USA.

Vest, J.H.C. 2010. Will-of-the-land: A philosophy of wilderness praxis and environmental ethics. Saarbrücken, Germany: VDM Verlag Dr. Müller.

Whyte, K., 2024. Why does anything need to be called wild. In: Minteer, B.A.; Losos J.B. eds. The heart of the wild: Essays on nature, conservation, and the human future. Princeton University Press: 71–83.

Wilson, E.O. 1986. Biophilia. Harvard University Press.

Wilson, E.O. 2017. Biophilia and the conservation ethic. In: Mysterud, I. ed. Evolutionary perspectives on environmental problems. Routledge: 250–258.

Woods, M. 2017. Rethinking wilderness. Broadview Press.

Grasslands:
Forgotten Wilderness and Urgent Conservation Needs

BY ERIN DRAGE, KENT REDFORD, HANNAH TIMMINS, NIGEL DUDLEY, WILLIAM SNOW, FERNANDO SANCHEZ-TRIGUEROS, and TIM TEAR

Abstract

Global discussions about wilderness and conservation have largely focused on forests. Consequently, much of the attention, scholarship, action, and financing for conservation has been tied up in ecosystems with tree cover. Left largely unattended are grasslands, which cover some third of the Earth's terrestrial surface, encompassing diverse ecosystems from cold dry Patagonia grasslands, montane grasslands of Europe and Central Asia, savanna grasslands of eastern Africa, and the temperate grasslands of North America. Everywhere they are found, grasslands contain very high biodiversity, globally significant concentrations of large animals, and, as revealed in recent research, very high concentrations of soil carbon. Equally important are the cultural and spiritual dimensions of grasslands. For millennia, grasslands have served as cradles of human civilization, nurturing Indigenous Peoples and local communities whose cultures remain intricately intertwined with the full suite of life in these sacred ecosystems. Despite their immense value, grasslands are amongst the most threatened and least protected of the Earth's biomes. A large proportion of remaining grasslands have been fundamentally modified and are no longer functioning as a natural ecosystem—let alone a wilderness. It is crucial that we move toward full recognition of grasslands within the wilderness community and promote more holistic conservation and stewardship efforts globally.

Introduction

Grasslands represent a crucial yet underappreciated component of Earth's ecological tapestry. Covering approximately one-third of the planet's terrestrial surface, they play a pivotal role in the global carbon cycle, host a vast array of biodiversity, and have been integral to the cultural, spiritual, and subsistence livelihoods of Indigenous Peoples and local communities for millennia. Despite their profound importance, grasslands face severe threats and are among the most poorly protected and highly altered biomes in the world. Many have been extensively modified, losing their ability to function naturally.

Erinn Drage *is Executive Officer of the IUCN World Commission on Protected Areas.* ***Kent Redford*** *is Principal at Archipelago Consulting and Advisor to the Chair of the World Commission on Protected Areas.* ***Hannah Timmins*** *is a consultant with Equilibrium Research.* ***Nigel Dudley*** *is a consultant with Equilibrium Research and co-editor of publications for the IUCN World Commission on Protected Areas.* ***William Snow*** *is acting director of Consultation at the Stoney Tribal Administration.* ***Fernando Sanchez-Trigueros*** *is an Assistant Professor of Environmental Studies and Native American Studies at the University of Montana.* ***Tim Tear*** *is the International Senior Scientist and the Biodiversity Research Institute.*

The question of what constitutes a high-quality grassland is critical here. Most grasslands have been settled for millennia (Scott 2017) and it is often impossible to trace an "original", pre-human ecosystem. Indeed, many of today's grasslands evolved alongside humans (e.g., Wiezik et al. 2023). A wilderness in this context does not imply "untouched", but there are degrees of naturalness, from monoculture, non-native grassland grazed as a crop (Godfree et al. 2017), to near-natural ecosystems with a huge biodiversity. Grassland wilderness implies a high level of naturalness and will probably also have important socio-cultural values. When considering grassland quality, multiple perspectives are therefore needed, representing naturalness, diversity, ecosystem services, and cultural, spiritual and livelihood values; identifying "good quality" grassland in any landscape is likely to be at least partly a negotiation.

This article seeks to redress the imbalance in conservation focus by highlighting the critical role of grasslands, exploring their diverse values, and addressing the urgent need for effective stewardship. We aim to offer a nuanced perspective on how to conserve and restore these vital ecosystems for the benefit of both nature and humanity.

Grasslands: A Forgotten Wilderness?

Grasslands, found in both tropical and temperate regions, are defined as areas dominated by grasses or other graminoids with a low abundance of trees or shrubs. They can be divided into natural grasslands, semi-natural grasslands, intensively managed grasslands, fully converted grasslands, and desertified grasslands (Bardgett et al. 2021; Stevens et al. 2022). They are among the most species-rich habitats on Earth, by some measures rivaling tropical rainforests (Petermann and Buzhdygan 2021). They also store roughly one third of terrestrial carbon, more than 90% of which is underground (Borer and Risch 2024).

Grasslands provide a wide range of material and non-material benefits to humans, including biodiversity conservation, livestock forage, food production, water supply and regulation, soil fertility, carbon storage, climate mitigation, pollination, recreation, and cultural and aesthetic services (Plantlife et al. 2023; Bardgett et al. 2021). They also support a very large number of people, including pastoralists who manage approximately half of the world's livestock. There is a huge cultural diversity among people of the grasslands; many of these cultures are under significant threat (Plantlife et al. 2023).

However, all is not well with the world's grasslands, which are the most imperiled terrestrial ecosystem on the planet (Scholtz and Twidwell 2022). Major threats include conversion to croplands, overgrazing, fire suppression, abandonment, nitrogen deposition, climate change, woody encroachment and tree planting, and invasive species (Petermann and Buzhdygan 2021). Degradation is particularly a problem; by 2016, as much as 49% of the grasslands on the planet have been degraded to some extent (Murphy et al. 2016).

There are efforts focused on defining global priorities for grassland conservation. These include mapping old growth grasslands considered as ecologically distinct from recently formed grasslands. Once destroyed, these grasslands would require at least a century or more to recover their plant richness (Nerlekar and Veldman 2020), supposing that seed sources remain. One priority focuses on old growth grasslands, which are unique in their biodiversity, contain high species diversity assembled over centuries, feature long-lived perennial plants, and have a substantial proportion of well-developed below-ground structures (Buisson et al. 2022). The last remaining intact grasslands with over 60% of their area intact (Scholtz and Twidwell 2021) are also a global conservation priority.

The Roles of Wildlife in Maintaining Grassland Wilderness

In all ecosystems, wildlife plays an often-ignored role in maintaining function. Bring to mind pollinators strengthening the genetic diversity of plants; herbivores dispersing seeds and dropping them far from their mother tree with a healthy dose of fertilizer; beetles, worms, and rodents crunching, aerating and mixing nutrients in soils to improve plant health; grazers and browsers managing the make-up of plant communities and predators managing the make-up of browsers and grazers (Timmins et al. 2024). Grassland wilderness is no exception. Megafaunal ungulates (>45kg) are well-known examples: they are one of the four most common forces in grassland creation along with fire regimes, aspect, and climate (Jepson and Blythe 2021; Trepel et al. 2024). Many grass species have co-evolved with the intense, irregular, and ever-shifting herbivory of ungulates. In North America, the American bison is the star of this guild. Bison consumption of the drier tops of the shoots causes grasslands to green up faster, more vividly, and for longer seasons (Beca et al. 2022). Migratory herds also shift nutrients like phosphorus and nitrogen from areas of high concentration to areas of low concentration. The "green wave" that follows in the wake of these migrations has been understood and utilized by Indigenous Peoples in North America for millennia (Geremia et al. 2019; Roman 2023).

In East Africa, wildebeest play much the same role. Wildebeest dung also converts above-ground biomass, vulnerable to fires, into safer soil organic carbon. In this way, the return of large wildebeest populations to the Serengeti shifted the ecosystem from a degraded carbon source into a healthier carbon sink (Holdo et al. 2009).

Working around these super engineers are the other grassland technicians. The nursery web spiders, for example, whose presence causes grasshoppers to stress-eat carbon-rich (instead of nitrogen-rich) plants, altering the soil chemistry, slowing woody encroachment by up to 14 years and increasing soil carbon retention by 40% (Schmitz 2008). Or the bioturbators like the prairie dogs increasing nitrogen availability to plants (Augustine et al. 2023), and the dung beetles improving soil drainage by up to 37 times (Cheik et al. 2022).

It seems clear that full ecological recovery of grasslands will require the restoration of large, wild herds moving over extensive, connected, and diverse landscapes and the restoration of all other guilds—scavengers, predators, soil breakers, pollinators, and seed dispersers alike (Timmins et al. 2024).

Threats and Wicked Problems faced by Grasslands

A "wicked problem" is difficult to solve due to the number and complexity of causes; it has no single solution. Wicked here denotes resistance to change rather than evil. Overgrazing is a wicked and increasing problem affecting grasslands and savannahs worldwide, including many of the otherwise most natural areas that fall into our definition of grassland wilderness. Statistics are hard to find, but the UN Convention to Combat Desertification estimates that a fifth of the world's land surface is undergoing persistent, declining trends in productivity (UNCCD 2017) and research suggests that 60% of the world's grasslands are under "medium pressure" or "overstocked" in terms of relative stocking density (Piipponen et al. 2022). Overgrazing is driven by common factors, exacerbated by climate change and damages biodiversity, ecosystem services, and human wellbeing, threatening some of the oldest human cultures, rich in history and tradition.

Overgrazing creates degradation and desertification in grasslands and savannahs, causes biodiversity loss, erosion, flooding, and loss of carbon and damages human societies. There are also multiple interacting factors. Political changes can be critical, such as the forced settlement of nomadic people (Ying et al. 2023), perverse incentives such as tax breaks to build livestock numbers (e.g., Fetzel et al. 2018), and the loss of tenure or a squeeze

on land due to expansion of cash crops (Postigo 2021). These are often reinforced by social changes including demographic changes, a shift to a market economy amongst transhumant societies (Schaneika et al. 2021), and changing lifestyle expectations (Tessema et al., 2014). Cultural factors are sometimes influential, such as the high prestige associated with livestock in some societies (Rabinovich et al. 2019), which also encourages absentee ownership by people distant from the impacts on the land. Economic drivers can include an absence of realistic livelihood alternatives or the need to use livestock as collateral against loans, particularly in transhumant societies where people often have no fixed homes (Attanasio et al. 2015). Finally, ecological changes can tip the balance in a previously sustainable grazing regime, including those associated with climate change such as increased droughts and weather extremes (Cuni-Sanchez et al. 2018) and a lack of predators increasing herbivore populations (Cooke 2020).

Yet well managed grazing is preferable to many other land-use alternatives. People involved in grazing are aware of the problems but often feel trapped in a situation they are unable to control. Others confuse the issue by having romanticized views of pastoral societies or a simplistic understanding of the extent to which livestock can replace natural herbivores. Some degradation is so long-term that local people have come to regard it as normal. A focused response is needed, particularly in the face of climate change. But this will require some fundamental changes, such as the status of herders being more aligned to the health of grassland than the size of a herd, removal of perverse subsidies and legislation, and a better understanding of ecosystem and cultural services from grasslands.

Global Carbon Sequestration Through Grasslands

As Dobson et al. (2022) point out, savannas (including grasslands) are also vital but often overlooked carbon sinks. For example, historically the Serengeti has sequestered enough carbon in the soil to offset all the airline flights to East Africa and all the emissions in the region (Schmitz et al. 2014; Dobson 2009). Grasslands store globally significant quantities of carbon, but severe degradation leads to many grasslands emitting more carbon than they store, highlighting an urgent need for improved land management practices (UNCCD 2019). According to Dobson et al. (2022), what forests, grasslands, and savannas have in common is that these ecosystems provide the only scalable nature-based solutions to remove carbon dioxide from the atmosphere. A major question that remains is whether it is possible to manage grasslands differently at a scale that could have global significance.

Another key question is whether pastoralists and their livestock can become agents of change to reverse grassland degradation that is attributable to existing livestock management practices. While many studies show the benefits of shifting or rotational grazing management to increasing soil organic carbon (e.g., Chaplot et al. 2016), the vast majority of this work has occurred in experimental situations, and not at landscape scales. The world's largest soil carbon removal project is found in East Africa; it is the Northern Kenya Rangelands Carbon Project, which covers approximately 1.9 million hectares (4.7 million acres). The goals of this project are to improve grazing for pastoralists and generate additional revenue for 14 community conservancies; in the process, it is estimated to remove the equivalent of the emissions from over 10,000,000 cars annually (https://www.northernkenyacommunitycarbon.org/). This is the first landscape-scale project that has been documented to show that carbon dioxide removals are possible across large grassland areas via social change in pastoral grazing systems (Ritchie et al. 2024).

This first proof-of-concept rangelands restoration and community-based development project stands as an important example for the world that climate financing can make a difference. As stated above, many reasons have led the pastoralists in this region to become more sedentary, resulting in overgrazing and grassland degradation. Promoting the increased mobility of livestock was not possible without coordinated efforts and financial incentives that came from the carbon project (Ritchie et al. 2024). There are now multiple examples of similar projects starting in other grasslands in Africa, directly building from this early example, suggesting that it is possible to improve grazing management on degraded grasslands working with pastoralists on the landscape scale.

Another possible management practice that could be scaled across grasslands around the world to increase soil carbon and reduce carbon emissions is fire management. As has been demonstrated in Australia and then applied globally, shifting fires from late dry season to early dry season result in substantive reductions in carbon emissions (Lipsett-Moore et al. 2018). In addition, two global studies have recently demonstrated strikingly clear negative relationships between increasing fire frequency and soil carbon loss as well as between decreasing fire frequency and soil carbon accrual (Pellegrini et al. 2022, 2023), highlighting the importance of changing fire frequency as a dominant fire management objective. Similarly, substantial potential has been demonstrated for fire management to generate carbon-based revenue for protected areas in Africa with lions (and therefore containing grasslands) via fire's unique potential to generate carbon benefits from multiple carbon pools (i.e., soil and above ground woody carbon removals as well as emission reductions) (Tear et al. 2021). This additional carbon revenue stream could dramatically help these same chronically underfunded yet globally significant biodiversity priority areas containing fire-prone grasslands, highlighting another scalable management action that could have global impacts.

Threats to Global Grassland Ecosystems

Grasslands face many pressures. Land use change, whether to establish crops, introduce non-native grass species, or for afforestation all now threaten major areas of grassland around the world (UNCCD 2017). Invasive species are another major problem, with agriculture introducing non-native grasses and weed species throughout the world, even in many protected areas. The steady encroachment of invasive species into grassland in Nepal is now seen as a significant threat to the one-horned rhinoceros (*Rhinoceros unicornis*) for example (Lahkar et al. 2011). As well as changing floral composition, invasive species in grassland can also alter soil attributes (Jordan et al. 2008) and reduce restoration success (Gornish and dos Santos 2015). Climate change will have severe impacts although they are still poorly understood. However, under different circumstances, climate change could lead to increased growth but reduced soil organic carbon, and/or decreased growth and desertification (Puche et al. 2023). Changing fire regimes, including both artificial fire suppression and increased fires due to climate change are both altering ecosystem dynamics. The importance of grassland for biodiversity, culture, and food security, coupled with the severity of threats facing many ecosystems, make protection of remaining wilderness areas an urgent priority.

Toward an Ethic of Grasslands Conservation

Advancing effective grasslands conservation will require embracing a comprehensive approach to restoration and protection that integrates Western scientific research with local and traditional knowledge systems. Prioritizing the restoration and protection of diverse grassland types, while tackling key threats like overgrazing, habitat loss, and climate change, is essential for sustaining these critical ecosystems. Grasslands are not merely forgotten wildernesses; they are dynamic landscapes that support biodiversity, regulate climate, and sustain human livelihoods. Their intricate relationship with both natural processes and human history demands a multidimensional conservation approach that values both ecological functions and socio-cultural connections.

Grasslands have evolved alongside humanity, and their stewardship must reflect this deep, intertwined history. The urgency for action is clear: overgrazing, climate shifts, habitat degradation, and invasive species pose growing threats, underscoring the need for policies that recognize grasslands' vital role in carbon cycling, cultural heritage, and ecosystem resilience. By embracing their full complexity, we can develop a conservation ethic that respects grasslands as living systems essential for both nature and people. Building an inclusive, adaptive conservation framework is imperative to safeguard grasslands for future generations. Through decisive action, we can honor the enduring significance of grassland by fighting against grassland ecosystem decline.

References

Attanasio, O.; Augsburg, B.; de Haas, R.; [et al.]. 2015. The impacts of microfinance: Evidence from joint-liability lending in Mongolia. American Economic Journal: Applied Economics. **7** (1): 90–122.

Augustine, D.J.; Smith, J.E.; Davidson, A.D.; [et al.]. 2023. Burrowing rodents. In: McNew, L.B.; Dahlgren, D.K.; Beck, J.L., eds. Rangeland wildlife ecology and conservation. Cham: Springer International Publishing: 505–548.

Bardgett, R.D.; Bullock, J.M.; Lavorel, S.; [et al.]. 2021. Combatting global grassland degradation. Nature Reviews Earth and Environment. 2: 720–735.

Beca, G.; Valentine, L.E.; Galetti, M.; [et al.]. 2022. Ecosystem roles and conservation status of bioturbator mammals. Mammal Review. 52. doi:10.1111/mam.12269

Borer, E.; Risch, A.C. 2024. Planning for the future: grasslands, herbivores, and nature-based solutions. Journal of Ecology. 112(11): 2442–2450.

Buisson, E.; Archibald, S.; Fidelis A.; [et al.]. 2022. Ancient grasslands guide ambitious goals in grassland restoration. Science. 377: 594–598.

Chaplot, V.; Dlamini, P.; Chivenge, P. 2016. Potential of grassland rehabilitation through high density-short duration grazing to sequester atmospheric carbon. Geoderma. 271: 10–17.

Cheik, S.; Harit, A.; Bottinelli, N.; [et al.]. 2022. Bioturbation by dung beetles and termites. Do they similarly impact soil and hydraulic properties? Pedobiologia. 95. doi:10.1016/j.pedobi.2022.150845.

Cooke, A.S. 2020. Colonisation, impacts in conservation woodland and management of Reeve's muntjac (*Muntiacus reevesi*) in an English county. European Journal of Wildlife Research. 67(35).

Cuni-Sanchez, A.; Omeny, P.; Pfeifer, M. [et al.]. 2018. Climate change and pastoralists: Perceptions and adaptation in montane Kenya. Climate and Development. 11(6): 513–524. doi:10.1080/17565529.2018.1454880

Dobson, A. 2009. Food-web structure and ecosystem services: insights from the Serengeti. Philosophical Transactions of the Royal Society B: Biological Sciences. 364(1524): 1665–1682.

Dobson, A.; Hopcraft, G.; Mduma, S. [et al.]. 2022. Savannas are vital but overlooked carbon sinks. Science. 375(6579): 392–392.

Fetzel, T.; Petridis, P.; Noll, D.; [et al.]. 2018. Reaching a socio-ecological tipping point: overgrazing on the Greek island of Samothraki and the role of European agricultural policies. Land Use Policy. 76: 21–28.

Geremia, C.; Merkle, J.A.; Eacker, D.R. [et al.]. 2019. Migrating bison engineer the green wave. Proceedings of the National Academy of Sciences. 116(51): 25707–25713.

Godfree, R.; Firn, J.,S.; Knerr,N.; [et al.]. 2017. Why nonnative grasses pose a critical emerging threat to biodiversity conservation, habitat connectivity and agricultural production in multifunctional rural landscapes. Landscape Ecology. 32: 121–1242.

Gornish, E.S.; Ambrozio dos Santos, P. 2015. Invasive species cover, soil type, and grazing interact to predict long-term grassland and restoration success. Restoration Ecology. 24 (2): 222–229.

Holdo, R.M.; Sinclair, A.R.E.; Dobson, A.P. [et al.]. 2009. A disease-mediated trophic cascade in the Serengeti and its implications for ecosystem C. PLoS Biology. 7: e1000210. doi:10.1371%2Fjournal.pbio.1000210

Jepson, P.; Blythe, C. 2021. Rewilding: the radical new science of ecological recovery. London: Icon Books.

Jordan, N.R.; Larson, D.L.; Huerd, S.C. 2008. Soil modification by invasive plants: effects on native and invasive species in mixed-grass prairies. Biological Invasions. 10: 177–190.

Lahkar, B.P.; Talukdar, B.K.; Sarma, P. 2011. Invasive species in grassland habitat: an ecological threat to the greater one-horned rhino (*Rhinoceros unicornis*). Pachyderm. 49: 33–39.

Lipsett-Moore, G.J.; Wolff, N.H.; Game, E.T. 2018. Emissions mitigation opportunities for savanna countries from early dry season fire management. Nature Communications. 9: 2247

Murphy, B.P.; Andersen, A.N.; Parr, C.L. 2016. The underestimated biodiversity of tropical grassy biomes. Philosophical Transactions of the Royal Society B: Biological Sciences. 371: (1703), 20150319.

Nerlekar, A.N.; Veldman, J.W. 2020. High plant diversity and slow assembly of old-growth grasslands. Proceedings of the National Academy of Sciences. 117(31): 18550–18556.

Pellegrini, A.F.A.; Harden, J.; Georgious, K. [et al.]. 2022. Fire effects on the persistence of soil organic matter and long-term carbon storage. Nature Geoscience. 15(1): 5–13.

Pellegrini, A.F.; Reich, P.B.; Hobbie, S.E. [et al.]. 2023. Soil carbon storage capacity of drylands under altered fire regimes. Nature Climate Change. 13(10): 1089–1094.

Petermann, J.S.; Buzhdygan, O.Y. 2021. Grassland biodiversity. Current Biology. 31: R1141-R1224.

Piippponen, J.; Jalava, M.; de Leeuw, J. [et al.]. 2022. Global trends in grassland carrying capacity and relative stocking density of livestock. Global Change Biology. 28: 3902–3919.

Plantlife; WWF; Equilibrium Research. 2023. Integrating grasslands and savannahs into national biodiversity and climate commitments.

Postigo, J.C. 2021. Navigating capitalist expansion and climate change in pastoral socio-ecological systems: impacts, vulnerability, and decision-making. Current Opinion in Environmental Sustainability. 52: 68–74.

Puche, N.J.B.; Kirschbaum, M.U.F.; Viovy, N.; [et al.]. 2023. Potential impacts of climate change on the productivity and soil carbon stocks of managed grasslands. PLOS One. 18(4): e0283370. doi:10.1371/journal.pone.0283370.

Rabinovich, A.; Kelly, C.; Wilson, G. [et al.]. 2019. "We will change whether we want it or not". Soil erosion in Maasai land as a social dilemma and a challenge to community resilience. Journal of Environmental Psychology. 66: 101365.

Ritchie, M.E.; Suyianka, J.K.; Tear, T.H. [et al.]. 2024. Increased pastoralist livestock mobility is associated with large-scale rangeland restoration and soil carbon sequestration. agriRxiv. https://doi.org /10.31220/agriRxiv.2024.00233.

Roman, J. 2023. Eat, poop, die: How animals make our world. London: Profile Books Ltd.

Schaneika, N.; Brown, C.; Moritz, M. 2021. Critical transitions from pastoralism to ranching in Central Africa. Current Anthropology. 62 (1). doi:10.1086/713248

Schmitz, O. 2008. Effects of predator hunting mode on grassland ecosystem function. Science. 319: 952–954. doi:10.3955/046.086.0404

Schmitz, O.J.; Raymond, P.A.; Estes, J.A. [et al.]. 2014. Animating the carbon cycle. Ecosystems. 17(2): 344–359.

Scholtz, R.; Twidwell. 2022. The last continuous grasslands on Earth: Identification and conservation importance. Conservation Science and Practice. 4: e626

Scott, J.C. 2017. Against the grain:Aa deep history of the earliest states. New Haven, CT: Yale University Press.

Stevens, N.; Bond, W.; Feurdean, A.; [et al.]. 2022. Grassy ecosystems in the Anthropocene. Annual Review of Environment and Resources. 47: 261–289.

Tear, T.H.; Wolff, N.H.; Lipsett-Moore, G.J. [et al.]. 2021. Savanna fire management can generate enough carbon revenue to help restore Africa's rangelands and fill protected area funding gaps. One Earth. 4:1–16.

Tessema, W.K.; Ingenbleek, P.T.M.; van Trijp, H.C.M. 2014. Pastoralism, sustainability, and marketing. A review. Agronomy for Sustainable Development. 34: 75–92.

Timmins, H.L.; Stolton, S.; Dudley, N. [et al.]. 2024. Nature's technicians: The amazing ways in which animals maintain our world. Gland, Switzerland: WWF.www.worldwildlife.org/publications/nature-s-technicians-the-amazing-ways-in-which-wild-animals-maintain-our-world

Trepel, J.; le Roux, E.; Abraham, A.J. [et al.]. 2024. Meta-analysis shows that wild large herbivores shape ecosystem properties and promote spatial heterogeneity. Nature Ecology and Evolution 8: 705–716. Doi:10.1038/s41559-024-02327-6

UNCCD. United Nations Convention to Combat Desertification. 2017. Global Land Outlook. Bonn, Germany.

UNCCD. 2019. Realising the carbon benefits of sustainable land management practices: guidelines for estimation of soil organic carbon in the context of land degradation neutrality planning and monitoring. Chotte, J.L.; Aynekulu, E.; Cowie, A. [et al.], eds. United Nations Convention to Combat Desertification.

Wiezik, M.; Jamrichová, E.; Máliš, F. [et al.]. 2023. Transformation of West-Carpathian primeval woodlands into high-altitude grasslands from as early as the Bronze Age. Vegetation History and Archaeobotany. 32: 205–220. doi:10.1007/s00334-022-00896-9

Ying, T.; Rihan, H.; Purevtseren, M.; [et al.]. 2023. Impact of settlement-type grazing on rangeland vegetation in the Inner Mongolia autonomous region: a field verification of case study through a grazing experiment. Agricultural and Biological Research. 39(3): 537–546.

Large Wild Herbivores Restore Biodiverstiy and Support Adaptability of Landscape to Climate Change

BY DALIBOR DOSTÁL, ZDENKA KŘENOVÁ, and MILOSLAV JIRKŮ

Introduction

Biodiversity in Europe is currently facing serious challenges. Since the 1950s, the unprecedented decline of European biodiversity has been occurring (Burns et al. 2021; Eichenberg et al. 2021). Current landscape management has been identified as the main cause of this biodiversity crisis. Traditional forms of farming have been replaced by industrial agriculture and forestry with the widespread use of intensive technologies and toxic chemistry (Jepsen et al. 2015). The last remnants of species-rich habitats are rapidly disappearing from the European landscape. More and more, the conservation authorities are faced with the really difficult task of ensuring the survival of the last populations of endangered species in sufficiently large areas. Sites with an area of tens to thousands of hectares are crucial for the survival of viable populations of endangered species. Only large populations with sufficient genetic variability can survive into the future, and this is even more important in times of climate change (Jung et al. 2024).

Traditional conservation measures often fail over large areas. Mechanical or manual mowing suffers from a chronic shortage of field workers and insufficient funds. Mechanical mowing also brings unwanted carbon emissions. However, in many European habitats—especially species-rich grasslands, removal of biomass through mowing or grazing is essential to prevent the dominance of tall, competitive grasses and the encroachment of shrubs, which would otherwise lead to a decline in plant and insect diversity. In this context, mowing mimics the ecological function of natural herbivory. Leasing of sheep or other livestock is very expensive, and the grazing of domestic animals leads to contamination of the environment with toxic substances from veterinary chemistry (Gordon et al. 2021). Moreover, all these technical measures, imitating traditional ways of farming to various degrees, do not create a natural small-scale mosaic and microhabitat diversity that are necessary to support biodiversity in the landscape.

Dalibor Dostal *is a director of the conservation organization Česká Krajina (Czech Landscape) and a founder of the grazing reserve for wild horses, European bisons, and aurochs in the former MTA Milovice. Email: dalibor.dostal@ceska-krajina.cz.* ***Zdenka Krenova*** *is a head of Department of Biodiversity Research, Global Change Research Institute CAS and assistant professor at the Charles University in Prague. Email: krenovaz@czechglobe.* ***Miloslav Jirků*** *works at the Biological Center of the Academy of Sciences of the Czech Republic, where he deals with trophic rewilding and the return of large herbivores.*

A solution to this seemingly intractable challenge appeared a few years ago. The opportunity for the future came from the past—rewilding (Wieren 1995). Large wild herbivores that influenced and often directly shaped the European landscape for the last 2.6 million years are being reintroduced. These landscape engineers kept nature in a state of dynamic changes and created the conditions for the existence of species-rich communities and many other species, from butterflies to birds to small mammals.

Large wild herbivores specializing in herbaceous vegetation have significantly influenced European biodiversity. In the Holocene, the European landscape was shaped mainly by three species: the auroch (*Bos primigenius*), the European bison (*Bison bonasus*), and the wild horse (*Equus ferus*). The wild donkey (*Equus hydruntinus*) also shared some territories with them. However, humans gradually exterminated these species and replaced them by domestic animals. In the second half of the 20th century, these domestic animals also disappeared from our landscape because of the industrialization of agriculture and forestry Moreover, the increasing use of chemical veterinary drugs in livestock farming—particularly antiparasitics such as ivermectin—has significantly reduced the ecological role of grazing animals. For example, dung from treated livestock often contains residues toxic to dung beetles and other invertebrates that depend on decomposing feces, thus disrupting dung-based food chains and nutrient cycling (Ambrožová 2023; Wall and Strong 1987). As a result, the formerly positive effects of grazing on biodiversity and ecosystem processes have been diminished.

The Former Military Training Area of Milovice

More recently, free-roaming large herbivores have been successfully integrated into the effective management of large landscape units in some conservation projects throughout Europe. The advantages of this type of management are demonstrated by the project in the former military training area of Milovice (Milovice MTA), which is located 30 kilometers from Prague, the capital of the Czech Republic.

Military training began there in 1904, still in the days of Austria–Hungary. From the original area of 3,465 ha, it has grown to 5,900 ha by the 1950s. Between 1968 and 1991, it was the largest base of the Soviet army in the former Czechoslovakia. Decades of military training protected vast areas from the effects of intensive agriculture, especially from the use of agrochemicals. The movements of tanks and other heavy equipment, large groups of soldiers, explosions, and other disturbances also created a mosaic of different microhabitats that hosted a high level of biodiversity.

However, after the departure of the army in 1991 and the abolition of the Milovice MTA, the biodiversity began to decrease. Rare species occurring in short-leaved xerothermic grasslands declined, some became completely extinct, e.g. natterjack toad (*Epidalea calamita*) and autumn gentian (*Gentianella amarella*). Expansive grasses, mainly the bushgrass (*Calamagrostis epigejos*), and several types of shrubs, mainly hawthorn (*Crataegus laevigata*) and dog rose (*Rosa canina*) began to dominate. The expansion of these species is common and poses a significant challenge in abandoned meadows across Central Europe. These species rapidly dominate mainly dry habitats, leading to a decline in biodiversity and degradation of native plant communities (Pruchniewicz and Żołnierz 2016). Natural succession, afforestation and the development activities (e.g. industrial zones, golf courses, motocross tracks) of marginal parts of the former Milovice MTA reduced one of the most valuable habitats of the open European savanna by 30 percent within a few years. The remaining parts further degraded due to the lack of proper management. And the declaration of the Natura 2000 site (the area protected under the EU Habitats Directive 92/43/EEC) in 2005, which covered 1,244 ha of the remaining valuable habitats, did not bring any changes in management.

The Large Herbivores Grazing Reserve Project

In 2015, the non-governmental organization European Wildlife in cooperation with its local branch Česká krajina (Czech Landscape) launched the large herbivores grazing reserve project with the aim of saving the biological diversity of the former Milovice MTA. It started on an area of 40 ha, from which it gradually expanded to the current 350 ha. Great attention was paid to the selection of herbivores. The aim was to maximize authenticity with the original species of European large herbivores or their closest equivalents for species that are now extinct. During the first several months, eight European bisons (*Bison bonasus;* Figure 1) were imported from several Polish reserves. Fifteen horses were also imported from the English Exmoor region (Figure 2) where they have lived for hundreds of years without human care and are traditionally called wild horses. Finally, six so-called Tauros (Figure 3), which is the modern-day equivalent of the extinct auroch (*Bos primigenius*) created through back-breeding, settled in the reserve.

Figure 1 - Large ungulates create and maintain a fine-grained mosaic of land cover—from disturbed areas with bare soil, through low-lying grasslands, to taller grasses and shrubs. This diverse habitat is ideal for many groups of organisms, including butterflies, beetles, and birds.

Figure 2 - Exmoor horses resemble the original wild horses of the European continent not only in their appearance and coloration, but also in their ability to graze on expansive grasses. After several years of grazing, these grasses recede, allowing flowering plants to establish—which the ponies tend to avoid while feeding.

Figure 3 - The back-bred aurochs resemble the original species that is now extinct because of human activities. They are similar not only in appearance, but also in their ability to survive in the wild without human intervention. The powerful horns break through the scrub, contributing to the maintenance of open landscapes.

The preservation and long-term security of species diversity on valuable conservation areas are the greatest benefits of natural grazing in the former MTA Milovice (Figure 4). Furthermore, rapid restoration of biodiversity in areas degraded by human activities, soil restoration, support for water retention in the landscape, and adaptation of the landscape to climate change, including carbon storage in the soil, are other important outputs of this project. Natural grazing, which removes old stands of dry grasses and bushes (i.e. highly flammable substrates) from the landscape, is also an important fire prevention measure. And finally, it should be remembered that it has the significant benefit of reducing landscape maintenance costs.

Figure 4 - The study plot was overgrown with bushgrass (Calamagrostis epigejos) in 2015 (left). Only after three years of grazing by large wild herbivores were the expansive grasses effectively suppressed, leading to the restoration of species-rich grasslands (right).

The results of long-term research at the site has shown that grazing by large herbivores has positive effects on local biodiversity (Figure 5; Dvorský et al. 2021). A huge increase in populations has occurred, for example, in cross gentian (*Gentiana cruciata*), an endangered plant and one of the reserve's flagship species. In the part of the reserve where grazing lasts the longest, the number of adult gentians has increased by 367 percent. But even more important is the increase in the number of seedlings, which confirms the trend of population renewal. In 2016, scientists counted only 55 seedlings, but in 2021 there were already 3,109 young gentians.

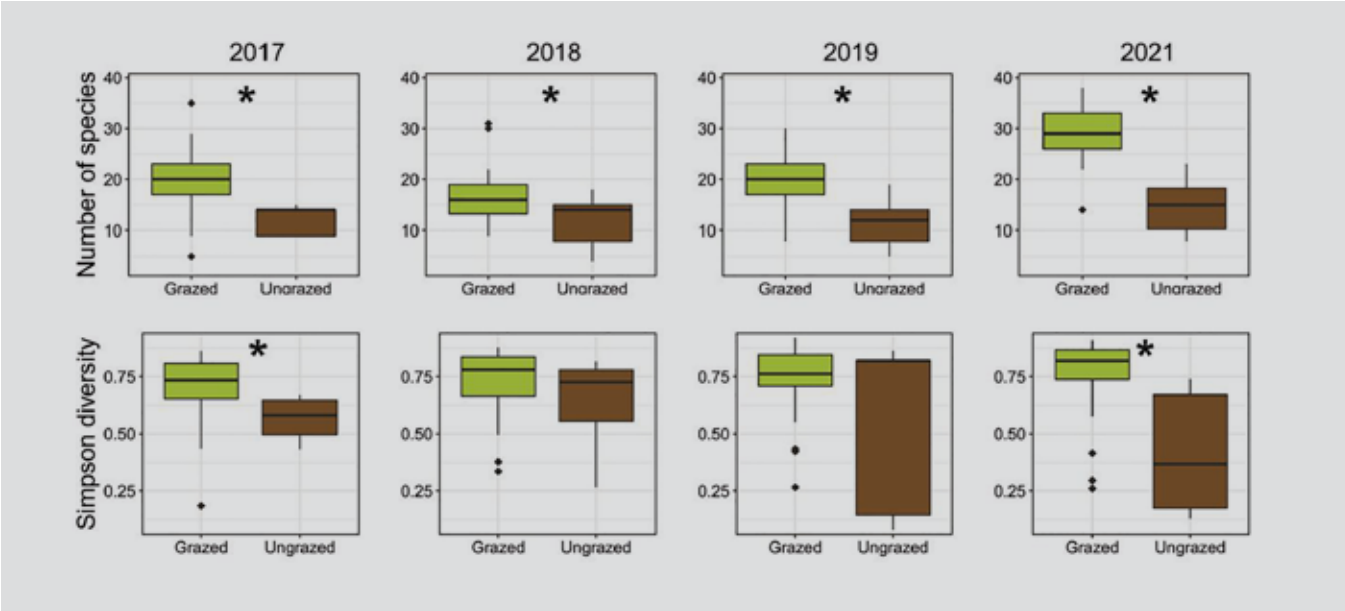


Figure 5 - Significantly higher diversity was recorded in grazed plots. Data from 2017, 2018, 2019, and 2021 are shown. Box-and-whisker plots of the number of species (top row) and diversity (bottom row) for grazed (green) and ungrazed (brown) plots are presented, with means (bold horizontal lines inside boxes), SD bars (vertical lines outside boxes), and outliers (diamonds); * indicates statistically significant difference (t-tests; $p < 0.05$) between grazed and ungrazed plots.

Thanks to the grazing of large herbivores, the numbers of the mountain Alcon blue (*Phengaris alcon* f. *rebeli*), the rarest species of butterfly occurring in the former Milovice MTA have also increased significantly (Konvička et al. 2021). In 2016, entomologists recorded only five individual butterflies at four mapped locations and the species was teetering on the edge of extirpation. Then in 2021, there were already 90 observed individual butterflies at 14 locations and numbers have continued to rise in subsequent years. As the wild large herbivores suppressed aggressive grass species and supported the resurgence of the cross gentians, the female mountain Alcon blues can lay their eggs on this unique food plant.

Conclusions

The effect of large wild herbivores on ecosystems is undoubtedly beneficial and very diverse. It is not only about effective management and saving of rare species but other effects are also important (van Klink et al. 2015).On a landscape scale, natural grazing creates a fine-grained mosaic of different microhabitats. These include opened gaps created around dust pools, short-leaved grasslands maintained through long-term grazing, and groups of woody plants and long-leaved grasslands that are only grazed during dormant season and representing important refugia for developmental stages of insects and small vertebrates. Thus, large herbivores create a varied landscape, which is essential for species and habitat biodiversity (Domínguez Lozano et al. 2025). The grazing of large herbivores is an opportunity to support European biodiversity not only in nature reserves, but also in other unprotected areas

In addition to this biodiversity conservation, large herbivores can also be effectively integrated into climate change adaptation measures. Rewilding is increasingly recognized as a nature-based solution to climate change mitigation (Perino et al. 2019) and the reintroduction of species that can influence carbon cycling and storage (Cromsigt et al. 2018) has even been proposed as a direct climate mitigation strategy. According to

scientific studies, grazing ecosystems across the planet capture up to 30 percent of the global volume of carbon. That is roughly 50 percent more than all the forests on Earth. Free-ranging herbivores help to regulate vegetation structure and promote carbon sequestration in soils by stimulating below-ground biomass production. Their grazing activities reduce the dominance of fast-growing grasses and allow the establishment of a greater diversity of plant species, which can store more carbon both above and below ground. In particular, restored grazing systems often increase soil organic matter and enhance microbial activity, which is essential for long-term carbon storage (Schmitz et al. 2018). Unlike intensive land use, these processes are low-input and self-sustaining.

In addition, the creation of more open, heterogeneous habitats can reduce the risk of large-scale wildfires, which are a growing source of carbon emissions under climate change. Rewilding also contributes to hydrological stability and climate regulation through improved water retention in grazed landscapes. Finally, by supporting biodiversity, rewilding strengthens ecosystem resilience and increases adaptive capacity. Importantly, rewilding is compatible with low-emission, extensive land use practices and has strong co-benefits for biodiversity, ecosystem services, and local communities (Egoh et al. 2021). As such, it should be considered an integral part of climate-smart conservation strategies and large herbivores should be an increasingly important contributor not only for the restoration of biodiversity, but also for adaptation and mitigation of climate change. In future research, we plan to expand our studies to include these aspects alongside our ongoing research on biodiversity benefits, focusing specifically on the Milovice locality. This will help us better understand and maximize the positive impacts of rewilding in this unique area.

References

Ambrožová, L. 2023. Dung beetles of Central Europe: Diversity and conservation. České Budějovice, Czech Republic: University of South Bohemia. 209 p. Ph.D. dissertation. Faculty of Science, School of Doctoral Studies in Biological Sciences.

Burns, F.; Eaton, M.A.; Burfield, I.J. [et al.]. 2021. Abundance decline in the avifauna of the European Union reveals cross□continental similarities in biodiversity change. Ecology and Evolution. 11: 16647–16660. doi:10.1002/ece3.8282

Cromsigt, J.P.G.M.; Te Beest, M.; Kerly, G.I.H. [et al.]. 2018. Trophic rewilding as a climate change mitigation strategy? Philosophical Transactions of the Royal Society B: Biological Sciences. 373: 20170440. doi.org:10.1098/rstb.2017.0440

Domínguez Lozano, F.; Navas, S.; Sánchez De Dios, R. 2025. Wild and domestic animals shape herbivory threats to endangered plants differently. Biodiversity and Conservation. 34: 1431–1448. doi:10.1007/s10531-025-03026-9

Dvorský, M.; Mudrák, O.; Doležal, J.; [et al.]. 2021. Rewilding with large herbivores helped increase plant species richness in dry grasslands. doi:10.21203/rs.3.rs-230859/v1

Egoh, B.N.; Nyelele, C.; Holl, K.D. [et al.]. 2021. Rewilding and restoring nature in a changing world. PLOS ONE. 16: e0254249. doi:10.1371/journal.pone.0254249

Eichenberg, D.; Bowler, D.E.; Bonn, A. [et al.]. 2021. Widespread decline in Central European plant diversity across six decades. Global Change Biology. 27: 1097–1110. doi:10.1111/gcb.15447

Gordon, I.J.; Manning, A.D.; Navarro, L.M.; [et al.]. 2021. Domestic livestock and rewilding: are they mutually exclusive? Frontiers in Sustainable Food Systems. 5: 550410. doi:10.3389/fsufs.2021.550410

Jepsen, M.R.; Kuemmerle, T.; Müller, D. [et al.]. 2015. Transitions in European land-management regimes between 1800 and 2010. Land Use Policy. 49: 53–64. doi:10.1016/j.landusepol.2015.07.003

Jung, M.; Alagador, D.; Chapman, M. [et al.]. 2024. An assessment of the state of conservation planning in Europe. Philosophical Transactions of the Royal Society B: Biological Sciences. 379: 20230015. doi:10.1098/rstb.2023.0015

Konvička, M.; Ričl, D.; Vodičková, V.; [et al.]. 2021. Restoring a butterfly hot spot by large ungulates refaunation: The case of the Milovice military training range, Czech Republic. BMC Ecology and Evolution. 21: 73. doi:10.1186/s12862-021-01804-x

Perino, A.; Pereira, H.M.; Navarro, L.M. [et al.]. 2019. Rewilding complex ecosystems. Science. 364: eaav5570. doi:10.1126/science.aav5570

Pruchniewicz, D.; Żołnierz, L. 2016. The influence of *Calamagrostis epigejos* expansion on the species composition and soil properties of mountain mesic meadows. Acta Societatis Botanicorum Poloniae. 86. doi:10.5586/asbp.3516

Schmitz, O.J.; Wilmers, C.C.; Leroux, S.J. [et al.]. 2018. Animals and the zoogeochemistry of the carbon cycle. Science. 362: eaar3213. doi:10.1126/science.aar3213

van Klink, R.; van Der Plas, F.; Van Noordwijk, C.G.E.; [et al.]. 2015. Effects of large herbivores on grassland arthropod diversity. Biological Reviews. 90: 347–366. doi:10.1111/brv.12113

Van Wieren, S.E. 1995. The potential role of large herbivores in nature conservation and extensive land use in Europe. Biological journal of the Linnean Society. 56: 11–23. doi:10.1111/j.1095-8312.1995.tb01114.x

Wall, R.; Strong, L. 1987. Environmental consequences of treating cattle with the antiparasitic drug ivermectin. Nature. 327: 418–421. doi:10.1038/327418a0

Why Rewilding is a Systemic Solution for the Systemic Crisis

BY KARL WAGNER

The world has become global. People are more interconnected and consciously in the same boat (Young 2024). Earth's citizens are probably more in agreement on many political and social positions concerning issues such as healthcare, climate change, inequality immigration, and the perceived state their country is in than ever before. At the same time, people in general want security and a decent level of wellbeing. They want to be able to feed their family, send their children to school, have a decent place to live and not have to fear violence, war, or social unrest.

As a global society we have now arrived at a point where no human society has ever been before. We are at an inception point of global dimension, crossing global boundaries, social and environmental tipping points (maybe we have crossed some already and have not noticed yet). It seems that we are right in the middle of the paradigm change that has been heralded for decades, when entire sets of beliefs and systems change overnight (see for example, Rifkin 2022; Leyden and Leonhard 2023). Time seems to move faster than ever, there is enormous momentum on all fronts and many people are probably checking for updates on political and social developments daily.

Massive systems change has happened before (albeit on a very different timescale, taking decades and centuries to unfold instead of years, months or even days) and human civilization has gone through several paradigm changes in its history.

Throughout these centuries we regularly found ourselves at "policy crossroads" where we had to decide which direction to take. We could have chosen an enlightened path of love and empathy, following for instance Francesco d'Assisi's teachings, but in many cases we chose Machiavelli's "love is great, but fear is better". In some cases, we could have chosen a more holistic approach to science, but instead we went for reductionist Newton, where only what can be measured is real.

For centuries, religion was our meta-narrative that explained the world. During the Age of Enlightenment, science became the meta-narrative, which has since been used to explain the world. Today, "economy" and its ultimate essence "money" are the meta-narrative used to explain the world; a cow is no longer a familiar living being, often with a name; it has become merely an asset with a financial value attached to it.

Modern civilization has managed to create a global systemic crisis, driven by an outdated theory and practice of economy and an inadequate governance structure that is still based on sorting things out on a national level, while many issues need to be addressed on a global or local level. To address the root causes of this systemic crisis, we will need systemic and holistic approaches and solutions.

The main root cause is our value system, which is causing poverty, inequality, overexploitation, and degradation on a planetary scale. It seems that in recent years the question of values has been left to the political and social extremes and consequently a powerful negative narrative has developed.

Karl Wagner *is Director of Campaigns of the Global Rewilding Alliance. Email: karl@globalrewilding.earth*

The systems change we witness is global, fundamental, and extremely quick: robots, Artificial Intelligence, holistic approaches instead of silo-thinking; entirely different attitudes towards economy, careers—no sector will stay the same.

However, a time of massive change is not only a time of potential upheaval and collapse, but also a time of massive opportunity for positive change and this is how we should see it. Old structures crumble, belief systems disappear, networks that profited from and kept up the structures dissolve. A place for something new is created. The options for fundamental change have not been greater for many decades, probably centuries.

Opinion polls show a global tendency towards wanting to solve the complex problems with a "strong leader" (Young 2024), which seems to be a regular reflex when things get complicated. As parts of the populace become more extreme, others are deeply concerned about where they see the world drifting to. Many just seem to hope that the wave will wash over them without doing too much damage.

We are currently witnessing a rise in political ambitions, a rollback of environmental legislation and loss in trust in science (which in my view is the result of relentless attempts by industry lobbies to discredit science that impacts their financial profits).

Social media has increased the possibilities of propaganda and brainwashing. Skilled opinion-makers capitalize on people's justified and understandable fears and grievances and lead their constituencies on a trajectory from fear and grievance to anger to rage to hate – a path that causes division and leads to social strife and ultimately to violence.

Fear of a new turbulent period of history is abundant, especially in Europe. Old ideas try to reverse time, but the world is moving on with an ever quickening pace. History does not mean reversing the flow of time; it is rather like walking up a spiral staircase and finding ourselves on the same spot, but a level higher. History is also no free lunch. It is shaped by actors and non-actors. You either watch it happen, or you do your part and try to influence it.

How do these mega-developments concern us and what can we do to influence developments? I am asking this question as a member of the wilderness and rewilding community that tends to be focused on achieving Nature's return on the ground, often with a local or national and sometimes transnational perspective in mind.

Rewilding is one of several systemic approaches that will shape our future. We might work on a specific creek or forest, a specific ecosystem or landscape, but what we do is part of a much larger effort for reviving Earth, for a new economy, a new lifestyle and an appropriate set of values that will enable us to live sustainably on a rich and diverse planet. The rewilding movement has the potential to become an important player in a much bigger game. It is growing fast and WILD12 was witness to this development as many contributions focused on rewilding, on regaining nature.

References

Leyden, P.; Leonhard, G. 2023. The 12 paradigm shifts that are changing our world: Peter Leyden and Gerd Leonhard. Video, 75:06 minutes. https://www.youtube.com/live/v-jERF9iW98?si=dguCaP3ChKrZlbiW

Rifkin, J. 2022. The age of resilience: Reimagining existence on a rewilding Earth. New York: St. Martin's Press. 320p.

Young, C. Page last modified: 2024 February. Ipsos populism survey. https://www.ipsos.com/sites/default/files/ct/news/documents/2024-02/Ipsos-Populism-Survey-2024.pdf. [Accessed 2025 October 7]

Section 3

Methods and Approaches for Managing Social and Ecological Systems

Protect the Wildest Lands, Establish Corridors, and Represent Biodiversity:

Evaluating Alternative Methods to Map Conservation Priorities

BY R. TRAVIS BELOTE and MATTHEW S. DIETZ

Abstract

Scientists recommend conserving intact ecosystems and establishing a network of connected protected areas that better represent ecosystem types and species diversity. In response to this recommendation, Belote et al. (2017) developed an index of "wildland conservation value" for the contiguous United States by combining four criteria: wildness, connectivity (corridors linking protected areas), ecosystem representation priority, and biodiversity priority. Here, we used data from Belote et al. (2017) to (1) compare methods of combining criteria into a composite map of priorities and (2) inspect the top-30% of values for each of the four criteria separately and in intersecting sets to assess goals in pursuit of the "30×30" target. Priorities using different methods were correlated but resulted in modestly different maps. Only 0.82% of land was at the intersection of all four criteria, yet 69% of the contiguous United States was in the top-30% of values for at least one criterion. Different conservation goals may require focus on different regions, such as the West to protect wildness, the Great Plains for ecosystem representation, and California and the Southeast for biodiversity. Many areas throughout the country provide options for establishing a connected network of protected areas.

Introduction

Protected areas are the foundation of strategies to sustain biological diversity. However, many of the most intact ("wildest") places left on Earth remain unprotected. Protecting "the last of the wild" is a conservation priority (Sanderson et al. 2002; Watson et al. 2018), so that ecological and evolutionary processes—upon which humans and other species depend—can be maintained. Further, the current system of protected areas is not intentionally connected via designated corridors, leaving protected areas vulnerable to becoming isolated fragments (Belote et al. 2016; Saura et al. 2019; Ward et al. 2020; Brennan et al. 2022). Protected areas also do not sufficiently represent biological diversity. Many types of ecosystems (Aycrigg et al. 2013; Dietz et al. 2015) and species (Jenkins et al. 2015; Dietz et al. 2020; Belote et al. 2021; Hamilton et al. 2022) in the United States are insufficiently represented or absent from formal protected areas. These unprotected ecosystems and species are vulnerable to continued loss as the human footprint expands in the coming decades (Sohl et al. 2014; Venter et al. 2016). An unconnected and unrepresentative system of protected areas may fail to retain biological diversity, especially as the climate changes (Dinerstein et al. 2020).

Travis Belote *is at the Wilderness Society in Bozeman, Montana and the Department of Ecology of Montana State University in Bozeman.* ***Matthew S. Dietz*** *is at the Wilderness Society in Portland, Maine.*

In recent years, conservation scientists have called for protecting and connecting more areas to maintain biological diversity (Dinerstein et al. 2019). Global initiatives recommend protecting 30% of lands and waters by 2030 as an interim goal and protecting 50% of lands and waters by 2050 (Noss et al. 2012). Questions remain as to which 30% or 50% of land and water should be prioritized for protection (Jung et al. 2021). The Kunming–Montreal Global Biodiversity Framework (GBF) Target 3 calls for 30% of land and water area to be protected in well-connected and ecologically representative networks focusing on areas of high ecological integrity and biodiversity importance (CBD 2022). The analysis of Belote et al. (2017) emphasized these same recommendations for the contiguous United States (CONUS). They suggested that future conservation areas should be established in the wildest unprotected lands (i.e., areas of high ecological integrity and low human modification) to help form a connected network of protected areas, which prioritizes ecosystems and endemic species that are poorly represented in existing protected areas. Belote et al. (2017) combined four criteria to produce an index they called the "wildland conservation value".

One can use various methods and algorithms to combine datasets. The simplest method—used by Belote et al. (2017)—normalizes quantitative spatial data so that all criteria have a common scale (i.e., values between 0 and 1) and sums values to create a composite heatmap (fig. 1 and top map in fig. 2). Summing values in this way to create a multi-criteria index is known as "weighted linear combination," which is used often in geospatial data analysis (Eastman et al. 1995; Malczewski 2000). Alternative methods, however, have been used to combine multiple criteria into an index for conservation planning (Sarkar 2012; Carroll et al. 2017; Jung et al. 2021). Specifically, methods accounting for the complementarity of values have been proposed (Moilanen 2007). Complementarity-based methods identify locations that maximize the inclusion of the highest values from each criterion (e.g., Belote et al. 2021).

Consider a region of the country that is the highest priority for biodiversity but is not very wild, has few important corridors, and is composed of ecosystems that are already well represented in protected areas. This hypothetical place that is the most critical for biodiversity might be "overlooked" using a simple summing method (e.g., Belote et al. 2021). A complementarity-based method would ensure that the best areas for each criterion are included as high priorities. In other words, a complementarity-based method will identify locations that, together, complement each other. It is unknown how the composite wildland conservation value of Belote et al. (2017) will change when other methods are used. Subjecting the four criteria to alternative methods will assess the sensitivity of the final map to various methods. As scientists develop spatial conservation plans, it is important to understand how the outputs might vary among methods for combining multiple criteria into one priority map.

This study has two objectives, which are focused on the wildland conservation value of Belote et al. (2017). Objective 1: Compare the original wildland conservation value of Belote et al. (2017) with prioritizations derived from other methods. Objective 2: Discuss the wildland conservation value in the context of the goal to conserve 30% of lands and waters by 2030 ("30×30"). We also discuss the opportunities to apply the criteria of the wildland conservation value to the management of federal public land.

Methods

The national assessment of wildland conservation values of Belote et al. (2017) included four criteria: wildness, connectivity-corridors between protected areas, ecosystem representation priority, and biodiversity priority (Figure 1). Each map was resampled to 270-m resolution using bilinear interpolation. Our measure and map of "wildness" was based on Theobald's (2013) human modification data. We reasoned that the least human-modified places would be the "wildest" lands (*sensu* Aplet et al. 2000), i.e., intact landscapes with high ecological integrity.

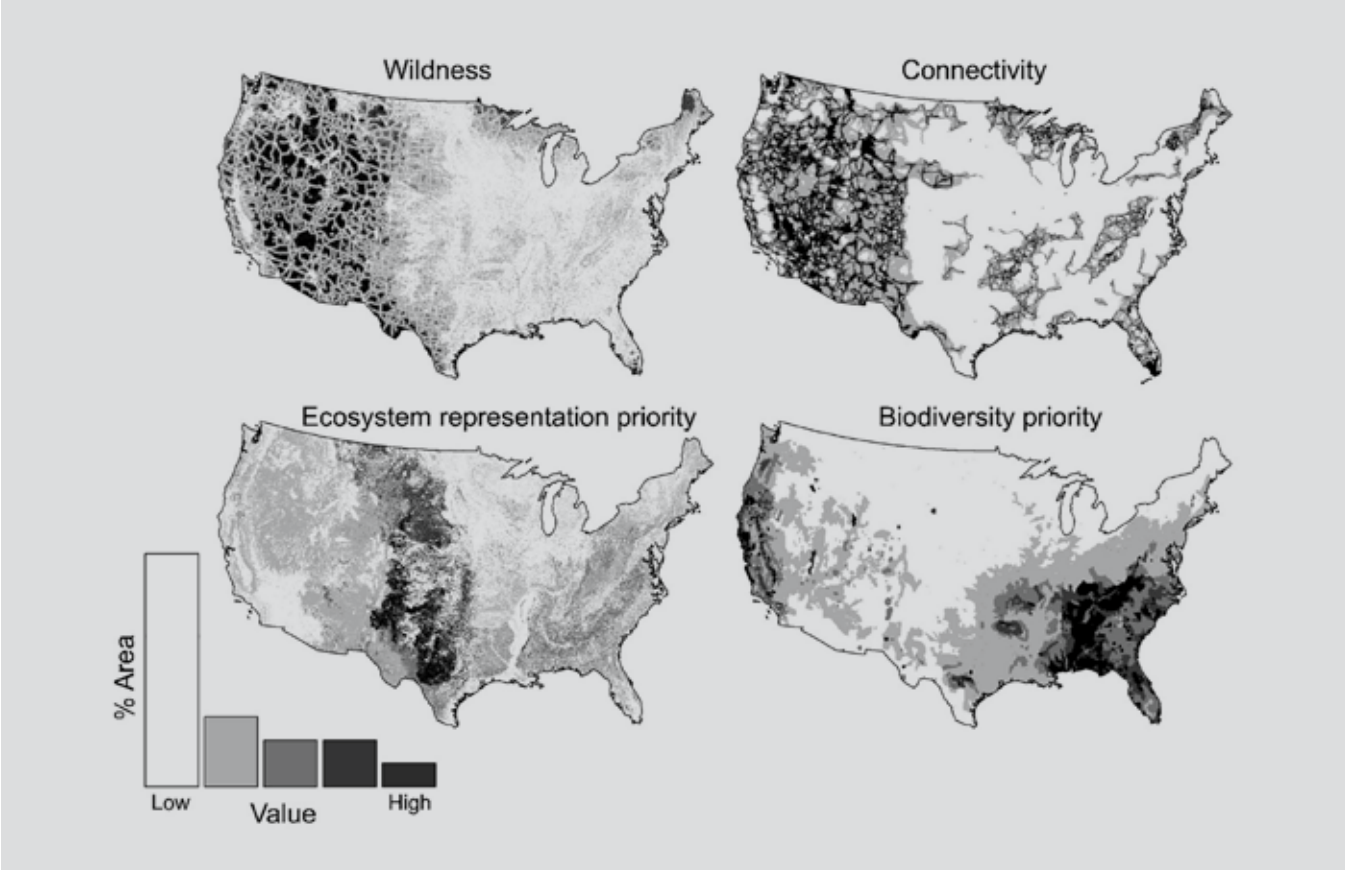


Figure 1 - Criteria used by Belote et al. (2017) to create a composite map of wildland conservation value. Each criterion is binned into the 50th (white), 75th, 80th, 90th, or 95th (black) quantile as shown in the histogram in the legend.

The measure and map of connectivity between protected areas was based on Belote et al. (2016), who used analyses of least-cost corridors between protected areas to identify and map corridors linking them. Belote et al. (2016) reasoned that organisms and ecological processes would be impeded in human-modified lands and used the wildness index from Aplet et al. (2000) and human modification data of Theobald (2013) to create maps of landscape resistance. They then used Linkage Mapper, an ArcGIS tool, to identify least-cost corridors between protected areas.

The measure and map of ecosystem representation priority was based on the analysis of Aycrigg et al. (2013) who overlaid highly protected areas (lands classified as Gap Analysis Project [GAP] status 1 or 2) with maps of ecosystems (ecological groups) to calculate the proportion of area occurring within protected areas. The proportion of area within protected areas was assigned to each ecosystem type and mapped. This map shows the ecosystems that are well protected and those that are poorly protected. Belote et al. (2017) created an index based on this measure, where more poorly protected ecosystems were assigned a high ecosystem-priority index.

The measure and map of biodiversity was based on the analysis of Jenkins et al. (2015). They overlaid maps of the distribution of mammals, birds, amphibians, reptiles, trees, and freshwater fish species with protected areas. Jenkins et al. (2015) then calculated a biodiversity priority by calculating species richness and weighted species based on their range sizes and proportion of ranges within protected areas. Species with smaller range sizes were more heavily weighted to emphasize locations where species are vulnerable to extinction due to their endemism and rarity. Species with lower proportions of their ranges within protected areas were also weighted to emphasize areas where species occur with minimal or no formal designated protection of their habitat.

Objective 1

Acknowledging the potential for missing important areas using the method of Belote et al. (2017), we compared the original published wildland conservation value to two complementarity-based methods that used the software Zonation. Specifically, we used the four normalized criteria to identify priority locations using the Additive Benefit Function (ABF) and the Core Area Zonation (CAZ) algorithms; ABF uses a cell-removal algorithm that calculates the importance of pixels to each criterion and averages the importance; CAZ uses an algorithm similar to ABF but where the priority is assigned to the maximum (not the mean) importance of each criterion for each pixel (Moilanen 2007). We used scatterplots and correlation analysis (Pearson correlation coefficients, r) to compare high-priority values from the three methods using a sample of 100,000 pixel locations (out of nearly 7.8 million).

Objective 2

In addition to comparing the method of Belote et al. (2017) with the two complementarity-based methods, we also combined our original four criteria in the context of "30×30" goals. Specifically, we selected and overlaid maps of the top-30% of values for each criterion. We reasoned that 30×30 goals could focus on the wildest 30% of lands, the most important 30% of lands for connecting protected areas, the most important 30% of places for representing ecosystems, or the most important 30% of biodiversity priorities. We asked where these top-30% of values were located and how the most important 30% for each criterion overlapped. After mapping the top-30% of pixels for each criterion we calculated the area of intersection and union. To help explain patterns from this overlay analysis, we used Pearson correlation coefficients with a sample of 100,000 pixel locations to evaluate pairwise relationships between the four criteria.

Results

Objective 1

Results from the different methods of combining the four criteria were all significantly correlated (Figures 2 and 3). Results from the Zonation ABF method were most highly correlated with results from the "summing" method (Figures 2 and 3). The similarity of priorities between these two methods is reflected in the maps (Figure 2 top and middle). The summing method highlights the Intermountain West, while results from Zonation ABF emphasize more the Southern Appalachian Mountains and Coastal Plains in the East. Results from the Zonation CAZ method were least correlated with the results from summing and emphasized the Appalachian Mountains and regions centered on the state of Alabama.

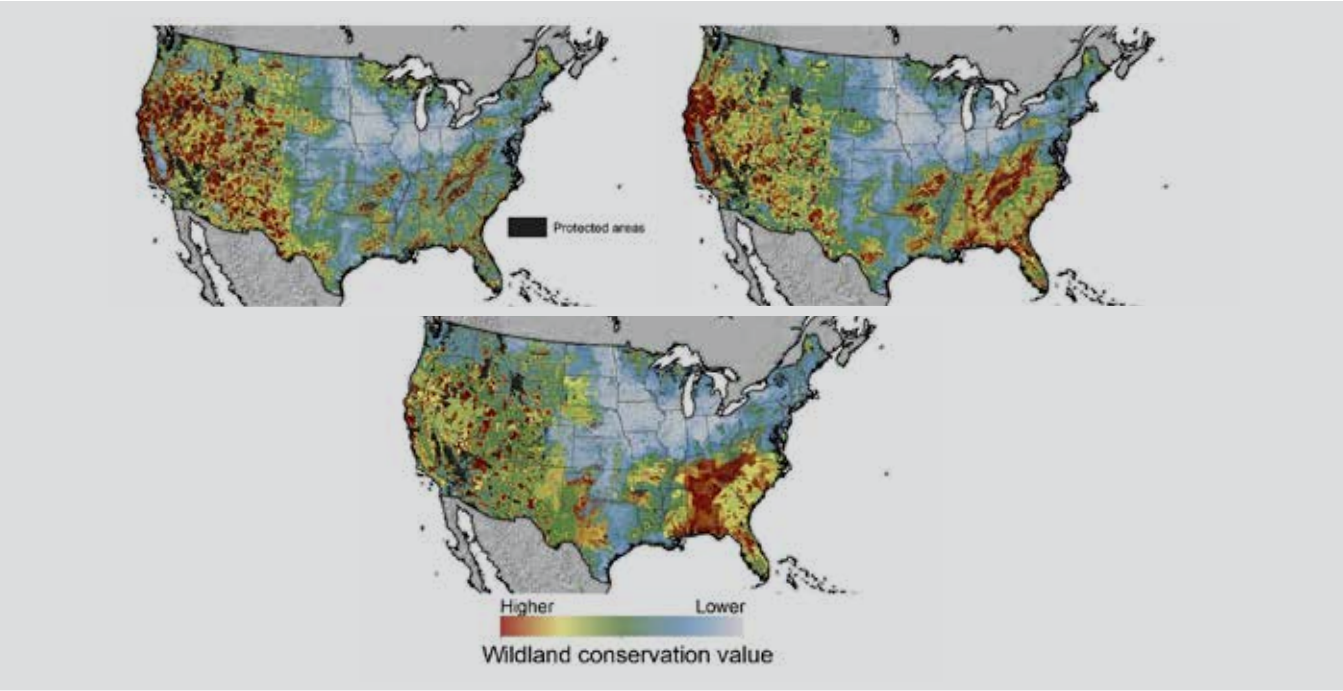


Figure 2 - Alternative methods to prioritize lands based on the four criteria shown in Figure 1. The top map is the wildland conservation value as published in Belote et al. (2017). The middle map is a priority value based on the Additive Benefit Function (ABF) algorithm in the conservation planning software Zonation. The bottom map is a priority value based on the Core Area Zonation (CAZ) algorithm in Zonation. The Zonation-based methods emphasize the complementarity of values among the four criteria while the sum method (top) emphasizes areas of overlap among the four criteria.

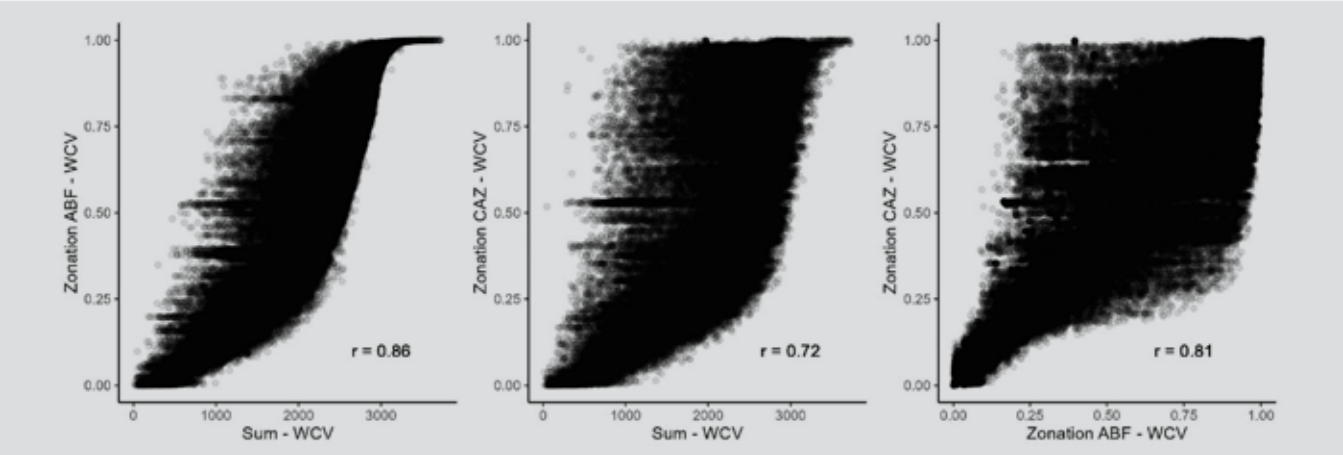


Figure 3 - Scatterplots show the pairwise relationships between priorities based on the three methods considered (Sum – WCV is the wildland conservation value based on summing normalized criteria; Zonation ABF – WCV is the wildland conservation value based on the Additive Benefit Function algorithm in Zonation; and Zonation CAZ – WCV is the wildland conservation value based on the Core Area Zonation algorithm in Zonation). All correlations are significant (Pearson's product-moment correlation coefficient, r, shown for each scatterplot). Corresponding maps of each method are shown in Figure 2.

Objective 2

Less than one percent (0.82%) of CONUS occurs at the intersection of the top-30% of values from all four criteria (wildness, connectivity, ecosystem representation priority, and biodiversity priority), but 69% of CONUS is in the top-30% of at least one criteria (Figures 4 and 5). The top-30% of biodiversity had the least overlap with the top-30% of other criteria (Figures. 4 and 5). These patterns can be explained by the lack of strong positive correlations among the four criteria (Figure 6). Wildness and the connectivity value were positively correlated (r = 0.60), followed by wildness and ecosystem representation priority (r = 0.56), and the connectivity value and

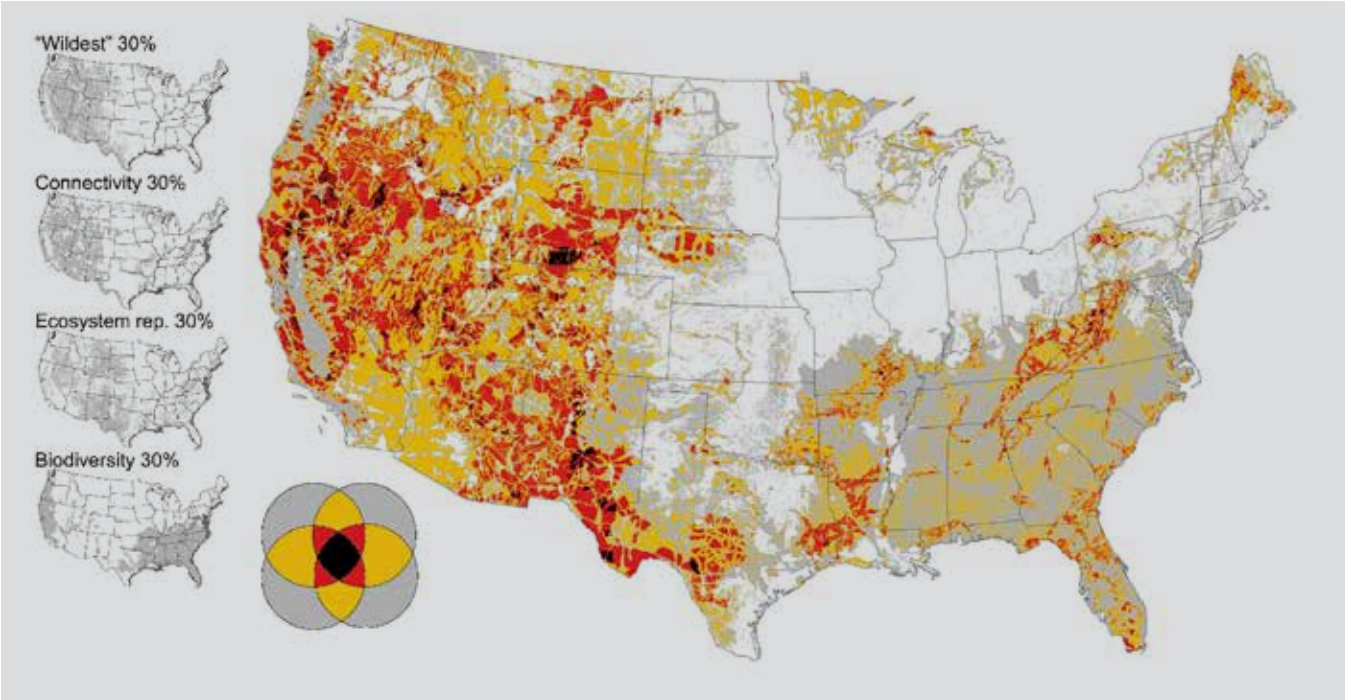


Figure 4 - One alternative method of combining the four criteria of the wildland conservation value involves overlaying the top-30% of values (shown in gray in the multiple small maps) and identifying their union and intersecting areas. Very little (<1%) of the area of the contiguous United States occurs at the intersection of all four criteria, but a large fraction (~69%) occurs within at least one criterion's top 30%. Percentages of the contiguous United States exclusive to one criterion and at the intersection of different combinations of criteria are shown in Figure 5.

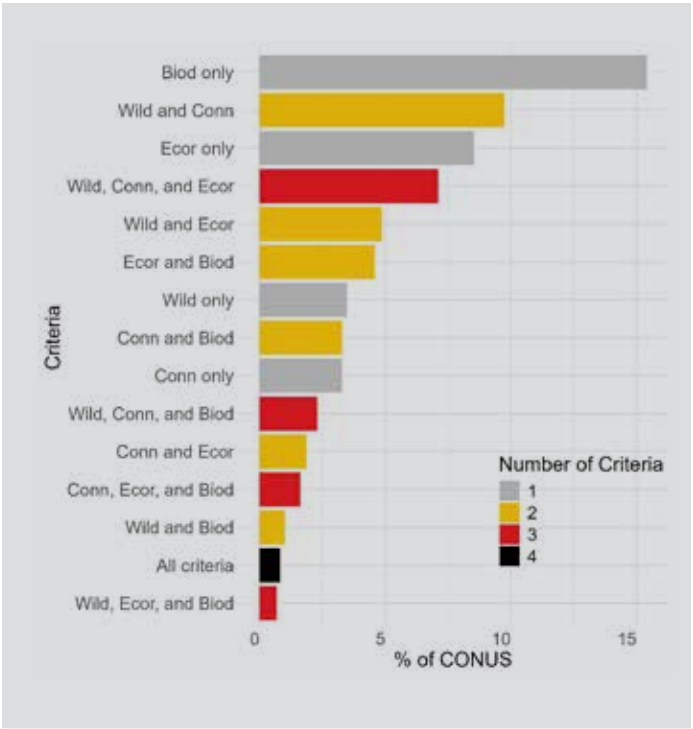


Figure 5 - Percentage of the contiguous United States (CONUS) within the top-30% of values for four criteria of the wildland conservation value (Wild = wildness; Conn = connectivity value; Ecor = ecosystem representation priority; Biod = biodiversity priority). Map of the intersections and union of criteria are shown in Figure 4.

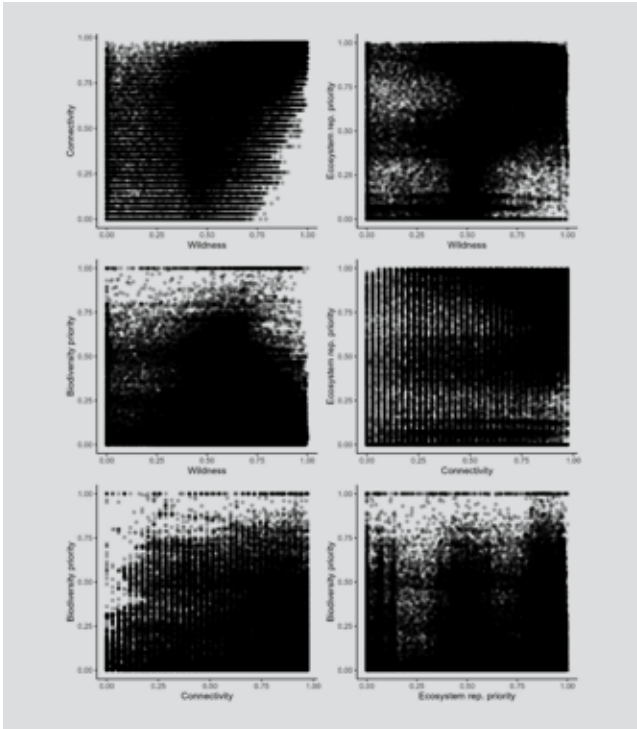


Figure 6 - Pairwise scatterplots of the four normalized criteria from Figure 1 show few strong correlations, which explains the small area at the intersection of the top-30% of values from all four criteria and the large area at the union of all four (see Figures 4 and 5).

ecosystem representation (r = 0.51). However, wildness and biodiversity priority were actually negatively correlated (r = −0.19). Correlation coefficients for connectivity and biodiversity priority (r = 0.03) and ecosystem representation priority and biodiversity were uncorrelated (r = 0.01).

Discussion

Protecting the wildest and unprotected lands, establishing a connected network of protected areas, and better representing ecosystem and species diversity in protected areas constitute primary goals outlined in Targets 1 and 3 of the GBF. The wildland conservation value for CONUS produced by Belote et al. (2017) demonstrated one method using four criteria corresponding to these goals: wildness, connectivity between protected areas, ecosystem representation priority, and biodiversity priority. This composite map still provides a framework and spatial information to help visualize and prioritize places for establishing a wild, connected, and diverse system of protected areas. The analysis reported here provides some important context and additional considerations when mapping conservation priorities.

We show that while alternative methods yield modestly different composite maps, all outputs are positively correlated. Outputs from different methods emphasize different areas depending on the algorithm used, but the "linear weighted combination" (i.e., summing normalized criteria) used in Belote et al. (2017) yields a simple and easily understood alternative. Maps like the wildland conservation value can help policymakers and conservation organizations prioritize actions aimed at the most important lands and waters to address the target to protect 30% of lands by 2030. It is important for spatial conservation planners to understand how different methods using the same inputs might yield different results. The high correlations among our three alternative methods give us confidence that the results of Belote et al. (2017) are relatively robust. Differences in the resulting maps among the three methods were subtle, with the exception of the Zonation CAZ method emphasizing the southeastern region more than the other methods. This reflects the fact that the Southeast uniquely represents the highest biodiversity priorities in CONUS. To maximize representation of biodiversity, the Zonation CAZ method prioritizes those pixels. It is well known that the southeastern United States represents a critical area for conserving biodiversity (Noss et al. 2015), especially given the abundance of endemic species and lower areal coverage of protected areas (Jenkins et al. 2015; Hamilton et al. 2022).

Our method of combining the four criteria after selecting the top 30% of pixels yielded some interesting patterns and insights into "30×30" targets and conservation priorities. Less than one percent of pixels (i.e., land area) occurred at the intersection of the top-30% highest priorities among the four criteria. However, 69% of pixels are in the top-30% of values for at least one of the criteria. These patterns suggest that different places in the contiguous United States are important for different reasons. In some ways, the patterns we observed with this and other analyses (Dreiss et al. 2024) support the adage quoted by Teddy Roosevelt: "Do what you can, with what you have, where you are." Conservation efforts are often focused on opportunities and threats, and the national data could help put areas of opportunity and threat into national context (e.g., Belote and Irwin 2017; Belote 2018).

In responding to calls to protect 30% of lands and waters by 2030, different organizations may focus on different places. A conservation organization focusing on protecting wild places could reasonably focus attention on the 30% most important places for that criterion (e.g., the intermountain western United States and northern Maine). There are regional opportunities throughout the country for establishing a connected network between

protected areas. An organization focused on protecting under-represented ecosystems might look to the prairies of the Great Plains and forests of the East. And an organization focused on biodiversity could reasonably concentrate on the Southeast and California.

Overlaying the top-30% of all four criteria from Belote et al. (2017) illustrates challenges with multi-criteria targets and analysis. One of the principles of spatial conservation is efficiency: conserve the most important targets with the least amount of area or cost (Watson et al. 2011). If 69% of the contiguous United States is in the top-30% most important places for at least one of four targets, then focusing on just the intersection or composite wildland conservation value could de-prioritize some of the most important places for one or more criteria in Belote et al. (2017) and in the GBF. Dreiss et al. (2024) showed similar patterns when overlaying the top-30% of values for four different maps of connectivity and the top-30% of values for biodiversity, separately. While actions must be prioritized, we believe it is important to explicitly consider what areas could be ignored. We further believe that spatial conservation planning efforts should re-evaluate the principle of efficiency. Why should we accept a scarcity mindset when it comes to conserving nature? The goal to protect 30% of land area is an interim goal on the way to protecting half of nature. Our results support the need to conserve more than 30% of land.

The framework laid out by Belote et al. (2017) was used to explore additional questions related to the wildness based on the intactness of species assemblages (Belote et al. 2020), a continental connected network of protected areas (Barnett and Belote 2021) and natural landscapes (Belote et al. 2022), the richness of species of conservation concern (Dietz et al. 2020), and evaluating alternative ways to prioritize sites for biodiversity (Belote et al. 2021). Data were also applied to various conservation applications, including evaluating the national significance of citizen-inventoried roadless areas in the Southern Appalachian Mountains (Belote and Irwin 2017), comparing national parks to wilderness study areas in Montana (Belote 2018), assessing the representation of ecosystems on the Flathead National Forest (Belote et al. 2015), and evaluating the importance of roadless areas for ecological integrity (Talty et al. 2020) and species diversity (Dietz et al. 2021).

Spatial conservation planning should lead to actions. While the title of Belote et al. (2017) emphasized adjectives (wild, connected, and diverse), here we emphasize verbs in our title: protect, establish, and represent. We need to *protect* the most intact and wildest places, *establish* a connected network of protected areas, and better *represent* biological diversity. Our results suggest that to sustain the most important places, these actions will likely need to be implemented on more than 30% of lands and waters in the contiguous United States to conserve biological diversity.

References

Aplet, G.; Thomson, J.; Wilbert, M. 2000. Indicators of wildness: Using attributes of the land to assess the context of wilderness. In: McCool, S.F.; Cole, D.N.; Borrie, W. T.; O'Laughlin, J., comps. Wilderness science in a time of change conference—Volume 2: Wilderness within the context of larger systems; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 89–98.

Aycrigg, J. L.; Davidson, A.; Svancara, L.K. [et al.]. 2013. Representation of ecological systems within the protected areas network of the continental United States. PLoS ONE. 8: e54689.

Barnett, K.; Belote, R.T. 2021. Modeling an aspirational connected network of protected areas across North America. Ecological Applications. 31: e02387.

Belote, R.T. 2018. Proposed release of Wilderness Study Areas in Montana (USA) would demote the conservation status of nationally-valuable wildlands. Land. 7(2): 69.

Belote, R.T.; Irwin, G.H. 2017. Quantifying the national significance of local areas for regional conservation planning: North Carolina's mountain treasures. Land. 6(2): 35.

Belote, R.T.; Dietz, M.S.; Aplet, G. H. 2015. Allocating untreated "controls" in the National Wilderness Preservation System as a climate adaptation strategy: A case study from the Flathead National Forest, Montana. Northwest Science. 89: 239–254.

Belote, R.T.; Dietz, M.S.; McRae, B.H. [et al.]. 2016. Identifying corridors among large protected areas in the United States. PLoS ONE. 11: e0154223.

Belote, R.T.; Dietz, M.S.; Jenkins, C.N. [et al.]. 2017. Wild, connected, and diverse: building a more resilient system of protected areas. Ecological Applications. 27: 1050–1056.

Belote, R.T.; Faurby, S.; Brennan, A. [et al.]. 2020. Mammal species composition reveals new insights into Earth's remaining wilderness. Frontiers in Ecology and the Environment. 18: 376–383.

Belote, R.T.; Barnett, K.; Dietz, M.S. [et al.]. 2021. Options for prioritizing sites for biodiversity conservation with implications for "30 by 30." Biological Conservation. 264: 109378.

Belote, R.T.; Barnett, K.; Zeller, K [et al.] 2022. Examining local and regional ecological connectivity throughout North America. Landscape Ecology. 37: 2977–2990.

Brennan, A.; Naidoo, R.; Greenstreet, L. [et al.]. 2022. Functional connectivity of the world's protected areas. Science. 376: 1101–1104.

Carroll, C.; Roberts, D.R.; Michalak, J.L. [et al.]. 2017. Scale-dependent complementarity of climatic velocity and environmental diversity for identifying priority areas for conservation under climate change. Global Change Biology. 23: 4508–4520.

CBD. Convention on Biological Diversity. 2022. Kunming–Montreal Global Biodiversity Framework. CBD/COP/DEC/15/4. Secretariat of the Convention on Biological Diversity, Montréal, Canada. https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf [Accessed 2025 July 1]

Dietz, M.S.; Belote, R.T.; Aplet, G.H.; [et al.]. 2015. The world's largest wilderness protection network after 50 years: An assessment of ecological system representation in the U.S. National Wilderness Preservation System. Biological Conservation. 184: 431–438.

Dietz, M.S.; Belote, R.T.; Gage, J.; [et al.]. 2020. An assessment of vulnerable wildlife, their habitats, and protected areas in the contiguous United States. Biological Conservation. 248: 108646.

Dietz, M.S.; Barnett, K.; Belote, R.T.; [et al.]. 2021. The importance of U.S. national forest roadless areas for vulnerable wildlife species. Global Ecology and Conservation. 32: e01943.

Dinerstein, E.; Vynne, C.; Sala, E. [et al.]. 2019. A global deal for nature: guiding principles, milestones, and targets. Science Advances. 5(4): eaaw2869.

Dinerstein, E.; Joshi, A.R.; Vynne, C. [et al.]. 2020. A "Global Safety Net" to reverse biodiversity loss and stabilize Earth's climate. Science Advances. 6(36): eabb2824.

Dreiss, L.M.; Anderson, M.G.; Bateman, B.L. [et al.]. 2024. Agreeing that maps can disagree: Moving away from map confusion in conservation. BioScience. 74: 281–289.

Eastman, R.; Jin, W.; Kyem, P.A.K.; [et al.]. 1995. Raster procedures for multi-criteria/multi-objective decisions. Photogrammetric Engineering and Remote Sensing. 61: 539–547.

Hamilton, H.; Smyth, R.L.; Young, B.E. [et al.]. 2022. Increasing taxonomic diversity and spatial resolution clarifies opportunities for protecting US imperiled species. Ecological Applications. 32(3): e2534.

Jenkins, C.N.; Van Houtan, K.S.; Pimm, S.L.; [et al.]. 2015. US protected lands mismatch biodiversity priorities. Proceedings of the National Academy of Sciences of the United States of America. 112: 5081–5086.

Jung, M.; Arnell, A.; de Lamo, X. [et al.]. 2021. Areas of global importance for conserving terrestrial biodiversity, carbon and water. Nature Ecology and Evolution. 5: 1499–1509.

Malczewski, J. 2000. On the use of weighted linear combination method in GIS: common and best practice approaches. Transactions in GIS. 4: 5–22.

Moilanen, A. 2007. Landscape zonation, benefit functions and target-based planning: unifying reserve selection strategies. Biological Conservation. 134: 571–579.

Noss, R.F.; Dobson, A.P.; Baldwin, R. [et al.]. 2012. Bolder thinking for conservation. Conservation Biology. 26: 1–4.

Noss, R.F.; Platt, W.J.; Sorrie, B.A. [et al.]. 2015. How global biodiversity hotspots may go unrecognized: lessons from the North American Coastal Plain. Diversity and Distributions. 21: 236–244.

Sanderson, E.W.; Jaiteh, M;. Levy, M.A. [et al.]. 2002. The human footprint and the last of the wild. BioScience. 52: 891–904.

Sarkar, S. 2012. Complementarity and the selection of nature reserves: algorithms and the origins of conservation planning, 1980–1995. Archive for History of Exact Sciences. 66: 397–426.

Saura, S.; Bertzky, B.; Bastin, L. [et al.]. 2019. Global trends in protected area connectivity from 2010 to 2018. Biological Conservation. 238: 108183.

Sohl, T.L.; Sayler, K.L.; Bouchard, M.A. [et al.]. 2014. Spatially explicit modeling of 1992–2100 land cover and forest stand age for the conterminous United States. Ecological Applications. 24:1015–1036.

Talty, M.J.; Mott Lacroix, K.; Aplet, G.H.; [et al.]. 2020. Conservation value of national forest roadless areas. Conservation Science and Practice. 2: e288.

Theobald, D.M. 2013. A general model to quantify ecological integrity for landscape assessments and US application. Landscape Ecology. 28: 1859–1874.

Venter, O.; Sanderson, E.W.; Magrach, A. [et al.]. 2016. Sixteen years of change in the global terrestrial human footprint and implications for biodiversity conservation. Nature Communications. 7: 1–11.

Ward, M.; Saura, S.; Williams B. [et al.]. 2020. Just ten percent of the global terrestrial protected area network is structurally connected via intact land. Nature Communications. 11: 1–10.

Watson, J.E.M.; Grantham, H.S.; Wilson, K.A.; [et al.]. 2011. Systematic conservation planning: past, present and future. In: Ladle, R.J.; Whittaker, R.J., eds. Conservation Biogeography. First edition. Wiley: 136–160.

Watson, J.E.M.; Venter, O.; Lee, J. [et al.]. 2018. Protect the last of the wild. Nature. 563: 27–30.

Preliminary Biodiversity Survey of Selected Sacred Forests and Groves in Ekiti Skate, Nigeria

BY B.A. AGBOOLA, O. OWEN, A. AKINYUGHA, J. OTITE, E. ODEYEMI, and C.ANYEBE

Abstract

The biodiversity found in sacred groves is rich and sometimes exceeds that in protected areas and State-managed Forest reserves, underlining the importance of sacred groves. The majority of these sites are part of a community-based forestry system where protection and preservation are closely linked to enduring religious beliefs, community developed rules, and complex sociocultural and spiritual associations with deities and ancestral spirits. Hence, they are recognized as spiritual/sacred commons. Sacred groves were not created primarily for biodiversity conservation but are often the only remaining patches of natural or semi-natural habitats in several Nigerian landscapes. To ascertain this, 28 sacred forest and grove sites located in 21 towns in Ekiti State were visited to document their fauna and flora, taking into consideration the effects of nature and human activity on the state of indigenous wildlife. Results were used to inform biodiversity conservation strategies to prevent extinction of species as well as prevent other species from falling into the endangered species list. Due to the increase in human population and the greater demand for food production, remaining natural forests and land areas bordering the majority of these sacred sites are being cleared. We observed an increased rate of encroachment into most of these sacred sites by farmers, hunters, and loggers alike.

Introduction

The global biodiversity crisis is accelerating, driven by habitat loss, land use change, climate change, pollution, and unsustainable exploitation of natural resources. Nigeria, home to a range of biomes from lowland rainforests to montane grasslands, exemplifies this trend, facing one of the highest rates of deforestation globally. Within Nigeria, Ekiti State presents a microcosm of the broader national challenge. Though relatively small in geographic size, Ekiti's landscape of lowland forests, rocky outcrops, and riverine systems hosts a rich array of species. Yet, agricultural expansion, logging, and rapid urbanization have severely diminished its natural habitats.

Sacred groves are prevalent in many countries in tropical Africa, including Tanzania, Ghana, Nigeria, and Benin. Sacred groves are traditionally associated with deity worship, initiation rituals, and sacrifices. Ghana has some of the highest concentration in Africa with estimates of over 1,900 sacred groves of varying sizes, ranging from less than one hectare to several thousand hectares spread across the country.

B.A. Agboola *is at Agbo-Veterinary and Environmental Consult Ltd, Ikere-Ekiti, Ekiti State, Nigeria and is the corresponding author. Telephone: +2348188839058. Email: babajide.agboola@gmail.com.* ***O. Owen*** *is Technical Adviser to the Governor of Ekiti State on Forest Management & Climate Change.* ***A. Akinyugha*** *is Technical Adviser to the Governor of Ekiti State on Biodiversity and Environment.* ***Jovi Richard Otite*** *holds a PhD in Animal Science (reproductive physiology). His research interests include, semen extension and preservation, artificial insemination, cloning and other forms of assisted reproductive technology as a means of preserving domestic and endangered animal species.* ***Emmanuel Odeyemi*** *is a zoology graduate and currently works with the Ekiti State Forestry Commission.* ***Anyebe Paul Charles*** *is a passionate Forestry and Wildlife Management graduate and Field Conservation Officer with the Nigerian Conservation Foundation dedicated to wildlife conservation and ecotourism development in Nigeria.*

In southwest Nigeria, sacred groves were historically associated with the Yoruba People, for whom they are a symbol of identity. There are no estimates of the number of sacred groves in Nigeria. Previous studies carried out in Nigeria have focused on Osun-Osogbo sacred grove, a UNESCO World Heritage Site in southwest Nigeria, while little attention has been paid to lesser-known sacred sites in the country. Sacred groves provide both tangible and intangible benefits to local communities, which explain why they are protected. First, sacred groves are an essential part of the cultural and traditional beliefs and activities of local communities, providing a sense of place-based connections built over generations. In Nigeria, sacred groves are the sites for rituals, initiations, festivals, and ceremonies, including selecting and installing kings. They accommodate secrecy and privacy, which characterize the worship of deities in many traditional communities. In some places, they serve as burial sites for children and "wicked people" (i.e., those who died mysteriously). Some Nigerian sacred forests with shrines receive many visitors who seek supernatural solutions to their predicaments, such as strange sicknesses, poverty, joblessness, and fertility issues. Second, sacred groves may provide economic benefits for governments and contribute to food security for households. Developing some sacred sites into tourist destinations as in the case of Osun-Osogbo, attracts more visitors and generate income. Sacred Natural Sites are a broad term used to refer to land or water bodies that have special spiritual significance to peoples and communities. They can include individual trees, forests, rivers, waterfalls, meadows, wildlife, caves, lakes, or hills.

Sacred groves are regarded as biodiversity hot spots and have been noted to harbor many commercially important and highly valuable tree species. They are religioculturally and socioeconomically important to their communities, hence their sustainability and persistence are key to their host communities. These community-protected areas are mostly sacred natural sites, which are increasingly recognized as a traditional form of community-based conservation, even as they preserve areas that hold strong cultural and religious importance to local people.

Like most states found in the southwest, Ekiti also has its own fair share of sacred forests and groves, including the magnificent range of the Yoruba hills, Igbo-Ogun (Ogun Forest) in Ire-Ekiti, Igbo-Olosunta (Olosunto Forest) in Ikere-Ekiti, and Oke-Orin in Ilawe-Ekiti (Figures 1 and 2). Most of these sacred sites are located in the

Figure 1 - Ogun high priest giving an offering before entering the Ogun forest in Ire-Ekiti.

Figure 2 - Signage warning against trespassing at the entrance of "Igbo-Orin" in Ilawe-Ekiti.

montane areas and the rocky parts of the State while some are waterways. Due to the increase in population and the demand for more food production, the natural forests and land areas bordering the majority of these sites are being cleared. In addition, there is increased encroachment into most of these sacred sites by farmers, hunters, and loggers.

Against this backdrop, sacred forests and groves stand out as vital biodiversity refuges. In Yoruba cosmology, to which the Ekiti people belong, these sacred spaces are intertwined with spiritual traditions, rituals, and ancestral veneration. Historically protected by customary laws and religious sanctions, these groves have inadvertently preserved critical ecosystems. This study seeks to systematically document the biodiversity of selected sacred forests and groves across Ekiti State. Specifically, it aims to quantify species richness, identify key conservation threats, and recommend strategies for integrating community-based conservation with state-level biodiversity management policies.

Study Area

Ekiti State is situated between latitude 7°40′N and longitude 5°15′E in southwestern Nigeria (Figure 3). It shares borders with Kwara State to the north, Kogi State to the northeast, Osun State to the west, and Ondo State to the south and southeast. With a total land area of 6,353 square kilometers, the state has an estimated population of over 3.2 million.

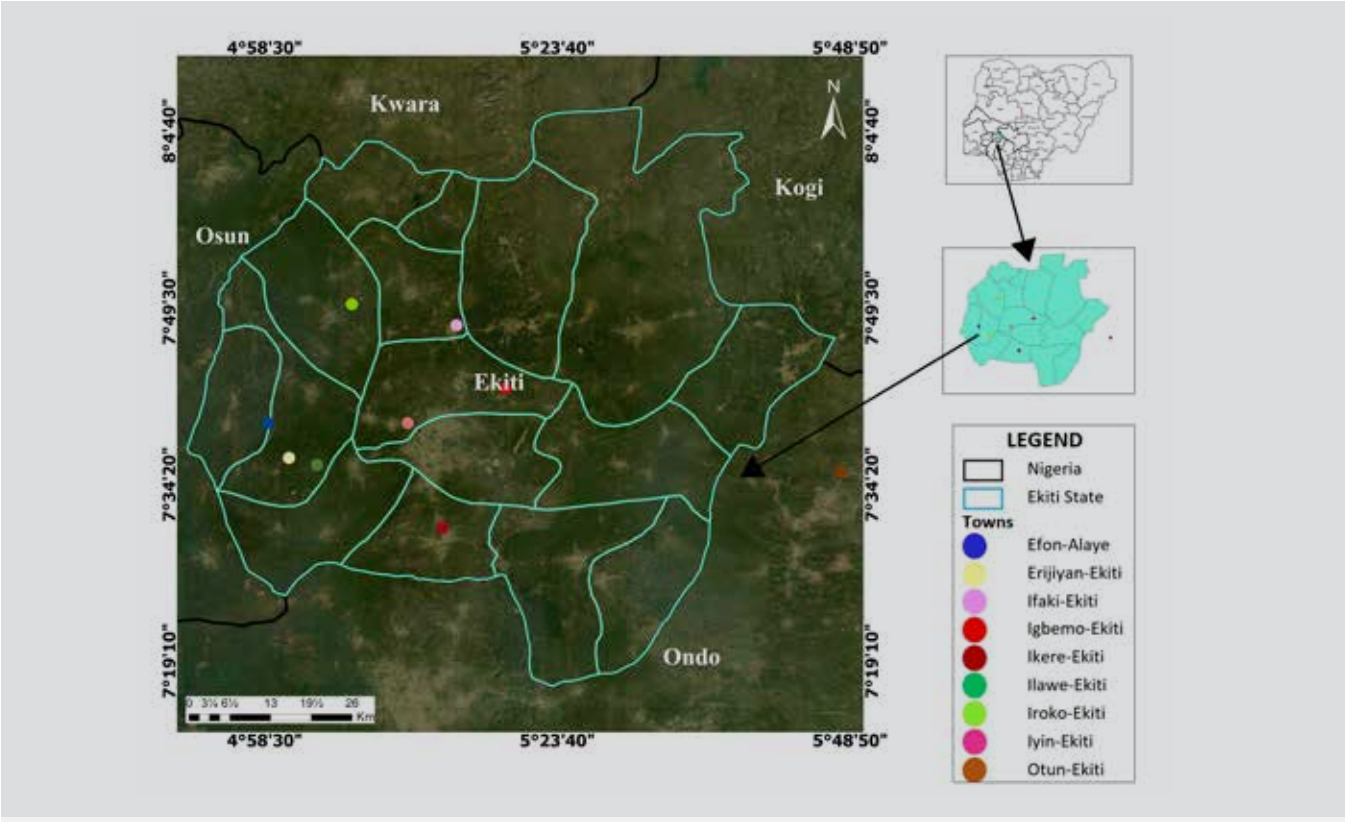


Figure 3 - Ekiti town map.

Topographically, Ekiti features rolling hills, rocky outcrops, and forested valleys, creating microclimates that support varied ecosystems. The climate is tropical with two main seasons: a rainy season from April to October and a dry season from November to March. Rainfall averages between 1,200 to 1,800 mm annually, supporting lush vegetation in the south and more savanna-like conditions in the north.

Culturally, Ekiti is predominantly inhabited by the Ekiti subgroup of the Yoruba People. Traditional beliefs and practices, including the reverence of sacred groves, continue to influence land use patterns and conservation ethics.

Materials and Methods

Survey Design and Team Composition

A stratified sampling design was employed, ensuring representation across ecological zones and cultural regions within Ekiti State. Preliminary field visits and interviews with traditional rulers, priests, and community leaders helped identify candidate sites for the biodiversity survey. The core survey team included staff from the Ekiti State Forestry Commission, faculty and students from Ekiti State University, representatives from the National Environmental Standards and Regulations Enforcement Agency (NESREA), local hunters, youth corps members, and civil society organizations.

All team members received training in the use of digital tools for biodiversity documentation, including iNaturalist and BirdLasser mobile applications.

Data Collection Tools and Procedures

Field data collection was guided by the following suite of tools and techniques:

- *GPS mapping:* Garmin eTrex 10 handheld units were used to record the precise locations of observations and to map the boundaries of surveyed groves.
- *Direct observation and photography:* binoculars and digital cameras were utilized to observe and document species, particularly elusive birds and small mammals.
- *Mobile applications:* observations of flora and fauna were uploaded to iNaturalist for species identification and validation. BirdLasser was used specifically for avian records, leveraging geo-tagged "pentads" for spatial analysis.
- *Species field guides:* identification was cross-checked with *Birds of Western Africa* (Borrow and Demey 2014) and *The Kingdon Field Guide to African Mammals* (Kingdon 2015). For each observation, metadata, such as date, time, GPS coordinates, habitat type, and associated human activities (e.g., logging, farming), were also recorded.

Biodiversity Assessment Metrics

Species richness was the primary biodiversity metric recorded; it is defined as the number of distinct species observed within a site. Other indicators included the presence of endemic and endangered species, the condition of forest structure (e.g., canopy cover, presence of large trees), and signs of anthropogenic disturbances (e.g., snares, logging scars).

Town	Latitude (°N)	Longitude (°E)	Species Richness
Ikere-Ekiti	7.51	5.23	45
Iroko-Ekiti	7.83	5.10	38
Ifaki-Ekiti	7.80	5.25	25
Otun-Ekiti	7.59	5.80	42
Iyin-Ekiti	7.66	5.18	30
Ilawe-Ekiti	7.60	5.05	28
Erijiyan-Ekiti	7.61	5.01	33
Efon Alaye	7.66	4.98	20
Igbemo-Ekiti	7.71	5.32	29

Table 1 - Locations of sacred sites that were surveyed and associated species richness.

Results

General Overview

The survey covered 28 sacred sites across 21 towns, representing about 20% of Ekiti State's land area. Sites varied considerably in size, from small groves less than one hectare to larger forest patches exceeding 20 hectares. Overall, 1,836 species observations were made, with 584 species confirmed through expert validation (Table 1).

The protection and preservation of these sacred sites are closely linked to enduring religious beliefs, community-developed rules, and complex sociocultural and spiritual associations with deities and ancestral spirits. Hence, they are recognized as spiritual/sacred commons. While sacred groves were not created primarily for biodiversity conservation, they are often the only remaining patches of natural or semi-natural habitats in several landscapes. It has been proven that the involvement of formal institutions alongside customary institutions in sacred grove management reinforces compliance with conservation laws within the sacred groves, especially where traditional norms are weak or may be disregarded.

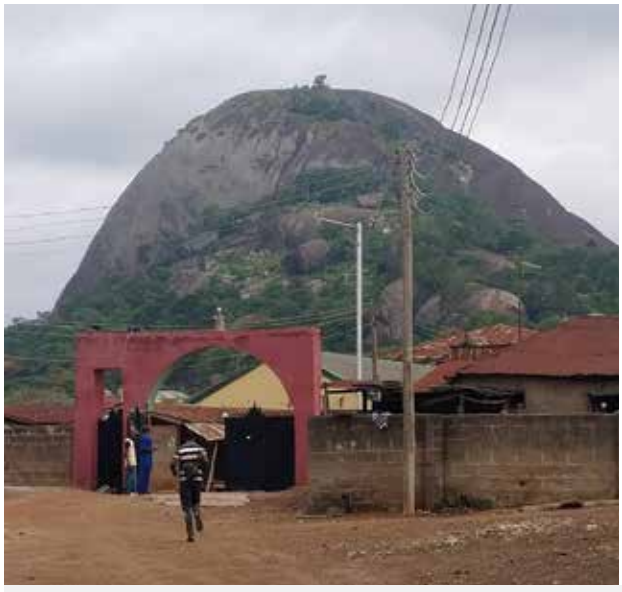


Figure 4 - Olosunta rock viewed from the Olukere's palace.

Figure 5 - View from the Olosunta forest.

Notable Sites and Species

At Igbo-Olosunta in Ikere-Ekiti (Figures 4 and 5), the rocky montane forest harbored species such as the Yellow-Billed Kite (*Milvus aegyptius*), Lizard Buzzard (*Kaupifalco monogrammicus*), and Red-Flanked Duiker (*Cephalophus rufilatus*). The site's cultural significance as a sacred mountain contributed to its relative ecological integrity.

In Iroko-Ekiti, Igbo-Riro forest showcased the Guinea Turaco (*Turaco persa*) and Woodland Kingfisher (*Halcyon senegalensis*). Community efforts to replant indigenous trees were evident, demonstrating active local stewardship.

Conversely, sites in Ifaki-Ekiti (Igbo-Olofin, Igbo-Eleruku, and Igbo-Obanifon) exhibited severe degradation due to historical logging and farming. However, natural regeneration was noted, and reforestation initiatives are underway.

Otun-Ekiti's Herbal Heritage Park (fig. 6), officially recognized under state law, supported rich avian diversity, including the African Paradise Flycatcher (*Terpsiphone viridis*) and Laughing Dove (*Spilopelia senegalensis*).

Threats to Biodiversity

Three main categories of threats were identified:

- *Encroachment and Habitat Loss:* agricultural expansion, especially for pepper farming and yam cultivation, has led to significant clearing around groves. Urbanization pressures were most intense around Ikere-Ekiti and Iyin-Ekiti.
- *Cultural Erosion:* traditional taboos and spiritual sanctions that once protected sacred groves are weakening, particularly among younger generations, leading to unauthorized entry and exploitation.
- *Pollution and Siltation:* rivers such as Erin Ayonigba showed signs of pollution due to nearby farming activities, affecting aquatic biodiversity and riparian vegetation.

Discussion

The findings confirm that sacred forests and groves in Ekiti State harbor significant biodiversity, often surpassing nearby non-protected areas. This supports broader research indicating that sacred natural sites globally serve as "accidental arks" of biodiversity conservation (Bhagwat and Rutte 2006).

The cultural framework surrounding sacred groves offers a valuable, cost-effective model for community-based conservation. However, without urgent revitalization of traditional stewardship practices and integration into formal legal frameworks, these ecosystems face an uncertain future.

The observed presence of endangered species such as the Red-Capped Mangabey (*Cercocebus torquatus*) and Ibadan Malimbe (*Malimbus ibadanensis*) further underscores the irreplaceable conservation value of these groves.

Figure 6 - Otun-Ekiti's Herbal Heritage Park.

Recommendations

Legal Designation of Sacred Groves

The Ekiti State government should prioritize the formal gazettement of key sacred groves as "Community Protected Forests" under the existing 2016 Forestry Law. This would confer legal status without undermining community ownership.

Strengthening Community Stewardship

Local conservation committees should be established at each grove, integrating traditional custodians, youth groups, and women's associations. Annual sacred grove festivals could be expanded to include conservation education components, thereby reinforcing cultural ties while raising awareness.

Restoration Initiatives

Sites such as Igbo-Olofin and Igbo-Eleruku should be prioritized for reforestation using native tree species. Restoration efforts should involve school-led tree planting campaigns to foster youth engagement.

Alternative Livelihood Development

To reduce reliance on forest resources, the state should promote alternative livelihoods such as eco-tourism, beekeeping, and the cultivation of medicinal plants. Provision of clean energy alternatives like improved cookstoves can help mitigate fuelwood dependence.

Monitoring and Research

Establish a long-term biodiversity monitoring program using citizen science platforms. Collaboration with local universities could support research grants focusing on ecological baselines and the socio-economic benefits of sacred groves.

Conclusion

Sacred groves in Ekiti State are invaluable for both their cultural and ecological significance. They provide critical refuges for biodiversity amid widespread environmental degradation. Integrating traditional conservation knowledge with modern legal frameworks, empowering communities, and promoting sustainable livelihoods are essential steps toward ensuring the long-term preservation of these ecological treasures. With targeted interventions, sacred groves can continue to serve as beacons of resilience and biodiversity conservation in Nigeria and beyond.

References

Bhagwat, S. A.; Rutte, C. 2006. Sacred groves: Potential for biodiversity management. Frontiers in Ecology and the Environment, 4(10): 519–524.

Borrow, N.; Demey, R. 2020. Field guide to birds of Western Africa. Bloomsbury Publishing.

Kingdon, J. 2015. The Kingdon field guide to African mammals. Bloomsbury Publishing.

The European Wilderness, Influenced by a Multidimensional Socio-Ecological Context

BY ALEXANDRA LOCQUET

Abstract

Since the 2000s, wilderness has played an increasingly important role in European nature conservation debates. A variety of initiatives are emerging to protect wilderness at different levels (local, national, international) across Europe. The difficulty of transposing the notion of wilderness into the diversity of linguistic and cultural contexts in Europe has led to the deployment of a variety of strategies with the common objective of encouraging the return of natural processes. This work shows that the conditions for wilderness protection strategies across Europe differ according to the cultural and socio-ecological contexts in which they are deployed.

Introduction

Since the late 2000s, a variety of wilderness initiatives have been emerging in Europe (Coleman and Aykroyd 2009; Bastmeijer 2016), mainly driven by non-governmental organisations (Locquet 2021). In 2009, a resolution on wilderness areas was adopted by the European Parliament (European Parliament 2009). Although without regulatory implications, it encourages member states to identify and act in favour of wilderness areas. However, the culturally constructed concept of wilderness (Carver et al. 2002; Jones-Walters and Čivić 2010; Ceauşu et al. 2015) is not translatable and transposable into many languages, and there are no schemes or recommendations to promote wilderness areas at the European level (Locquet and Héritier 2020). In this context, it is difficult to develop a common approach to protecting European wilderness. This is particularly true given Europe's great cultural and linguistic diversity, and its different socio-economic contexts, leading to varied representations of wilderness and making it impossible to agree on a single definition. The aim here is to study the conditions under which wilderness protection strategies across Europe are developed in different cultural and socio-ecological contexts (Locquet 2021; Barraud 2021).

Material and Methods

This research focuses on Western Europe, where many wilderness initiatives have emerged, with a particular focus on the United Kingdom, France, and the Netherlands. The work presented here is the result of doctoral research (Locquet 2021), which involved identifying the main organisations and stakeholders involved in wilderness initiatives in the study area (through bibliographical and field research). The organisations selected are those that claimed to act in favour of one of the studied concepts: wilderness, rewilding, wild land, or free evolution. The strategies of these organisations were analysed to understand how different actions in favour of wilderness are implemented across Europe. To understand the conditions regarding development and the variety of strategies deployed in Europe, we used a multiscalar approach and semi-directive interviews conducted with actors from the organisations included in the study.

Alexandra Locquet *is a geographer and associate researcher at the Laboratory of Social dynamics and spatial reconstruction (Ladyss UMR 7533) in France. Email: locquetalex@gmail.com.*

Results

An analysis of the discourses and actions developed within the framework of the various projects shows that there is a diversity of strategies proposed in Europe to encourage the return of greater naturalness within degraded ecosystems. These actions are expressed through the mobilisation and emergence of various concepts conditioned by the socio-ecosystem in which they are embedded (Locquet 2021). In the UK, notions such as wild land—especially in Scotland to designate formerly anthropised semi-natural spaces (McMorran et al. 2006)—and rewilding are used. The latter is also very widely employed in the Netherlands and more broadly on a European scale and is reflected in projects that aim to restore natural processes through the return of keystone species, more specifically herbivores in Europe (Lorimer et al. 2015). In France, the principle of "*libre évolution"* (free-evolving areas) is preferred to characterise the process of leaving natural environments develop without human intervention or specific reference conditions (UICN Comité français 2023).

In each of the countries studied, project objectives depend on the level of ecological integrity of the country's territory. In the British context, the main objectives are to encourage the return of forest cover—e.g., by planting trees—and prevent the homogenisation of habitats caused by heavy grazing. In France, actions aim to encourage the return of natural processes through the "*libre évolution"* principle and letting environments evolve, continuing the spontaneous forest recovery process of the last 150 years (Dodane 2010).

Moreover, our work has shown that rewilding strategies are also context dependent. In the UK, rewilding involves reducing the level of intervention in environments, as well as rebalancing grazing patterns and the presence of wild and non-wild herbivores at sites. Whereas on a European scale, rewilding is often understood as the return of large herbivores (e.g., bisons and horses) In France, such actions are also being carried out but are not categorised as rewilding.

There is also a divergence of views on what rewilding should involve, commonly perceived as a means of returning to a "wilder" state of nature. In the UK, stakeholders talk mainly about predators, which can be explained, among other things, by the disappearance of large carnivores from these areas, and by the particularly high pressure on the presence of wild or domestic herbivores. In contrast, in France, where carnivore populations are still present, it is mainly herbivores which are used to restore certain natural dynamics that have disappeared.

In addition to the semantic dimensions and the various concepts that are developed to help conserve wild nature in Europe. The strategies implemented also vary between countries (Locquet and Simon 2022), from a technical point of view and in terms of surface area, as well as in terms of access and authorization because of the diversity of national regulations and land tenure contexts. In the UK, for example, land is mainly structured into large estates (Glass et al. 2019), whereas in France, land is much more fragmented and comprises small parcels. Thus, in France, the projects implemented by some organisations are characterised by the research and acquisition of land. This has a major impact on the surface area of land available for wilderness projects. Similarly, the distribution of uses and practices is not the same in all European contexts, which impacts the project possibilities as well as the nature of the conflicts that may arise.

Conclusions

How wilderness is understood has an impact on the nature and conditions of the actions implemented in favour of such areas. Wilderness perception is particularly linked to individuals' and groups' representations of nature, which contribute to the construction of a social representation of wilderness. These conceptions are influenced by the socio-cultural contexts in which they evolve. As a result of European multiculturalism, several rep-

resentations of wilderness are emerging. This is reflected in the appearance of new concepts that contribute to the development of varied action strategies. The latter are largely determined by the regulatory, spatial and socio-economic contexts in which they are used. These results underline the fact that there is no such thing as wilderness in Europe, but rather a range of situated conceptions and practices of wilderness in European states, which contribute to the development of experimentation areas.

References

Barraud, R. 2021. (Re)Conquêtes sauvages : Trajectoires, spatialités et récits. Bordeaux, France: Bordeaux Montaigne University. HDR dissertation. Faculty of Geography.

Bastmeijer, K. 2016. Wilderness protection in Europe. The role of international European and national Law. Cambridge University Press.

Carver, S.; Evans, A.J.; Fritz, S. 2002. Wilderness attribute mapping in the United Kingdom. International Journal of Wilderness. 8 (1): 24–29.

Ceauşu, S.; Carver, S.; Verburg, P. H. [et al.]. 2015. European wilderness in time of farmland abandonment. In: Pereira H.M.; Navarro L.M., eds. Rewilding European landscapes. SpringerOpen: 25–46.

Coleman, A.; Aykroyd, T. 2009. Conference proceedings: Wild Europe and large natural habitat areas, Prague 2009. European Commission and Wild Europe.

Dodane, C. 2010. La France : des territoires en mutation. Les nouvelles forêts françaises. L'exemple Ardéchois. Géoconfluences.

European Parliament. 2009. European Parliament Resolution of 3 February 2009 on Wilderness in Europe (2008/2210(INI)). Vol. C 67 E/1.

Glass, J.R.; McMorran, R.; Thomson, S. 2019. The effects associated with concentrated and large-scale landownership in Scotland: A research review. Scotland's Rural College.

Jones-Walters, L.; Čivić, K. 2010. Wilderness and biodiversity. Journal of Nature Conservation. 18: 338–39.

Locquet, A. 2021. Born to be wild ? Représentations du sauvage et stratégies de protection de la wilderness en Europe. Paris, France: Paris 1 Panthéon Sorbonne University. Ph.D. dissertation. Faculty of Geography.

Locquet, A.; Héritier, S. 2020. Questioning nature and wildness in relation to establishment of wilderness areas in Europe. Cybergeo: European journal of geography.

Locquet, A.; Simon L. 2022. For a different kind of wildlife management: Actions in favour of the wilderness as a space for experience and a means of diffusing practices in Europe. Diversity. 14 (10): 819.

Lorimer, J.; Sandom, C.; Jepson, P. [et al.]. 2015. Rewilding: Science, practice, and politics. Annual Review of Environment and Resources. 40: 39–62.

McMorran, R.; Price, M.F.; McVittie, A. 2006. A review of the benefits and opportunities attributed to Scotland's landscapes of wild character. Commissioned Report No. 194 (ROAME No. F04NC18). Scottish Natural Heritage.

UICN Comité français. 2023. La libre évolution, une trajectoire de gestion des espaces naturels—accompagner les processus naturels dans leur adaptation aux changements globaux. Paris: French Committee of the International Union of Conservation of Nature.

Toward Meeting Europe's Commitment to 30x30 Targets: A Spatial Modelling Approach

BY STEVE CARVER and IURII STRUS

Abstract

This paper presents a Wilderness Quality Index 2.0 (WQI 2.0) for continental Europe using Google Earth Engine and data on land cover, transportation, and population. This is used to evaluate the conservation status of the wildest and most ecologically intact areas across Europe as a focus for meeting commitments under the Convention on Biological Diversity COP15 Kunming–Montreal Agreement on the 30x30 targets.

Target 3 states that we should protect at least 30% of land, sea, and water for nature through ecologically representative and well-connected protected areas. We use the WQI 2.0 to identify the top 30% wildest areas across continental Europe and then disaggregate these to further explore the top 30% wildest areas by country and by biogeographical regions. These patterns are cross-referenced with the International Union for Conservation of Nature and Natural Resources (IUCN) and Other Effective area-based Conservation Measures (OECMs) to identify those areas with notable wilderness qualities, but which might benefit from additional protection.

Target 2 states that we should restore at least 30% of areas of degraded areas. We explore the use of the component attributes of the WQI 2.0 to identify where improvements in one or more model input layers through on-the-ground measures could deliver on Target 2 particularly through modifications to and scaling back of land use impacts in areas of marginal economic activity.

Introduction

Understanding and mapping wilderness is fundamental to modern conservation and land management efforts. Wilderness areas, defined by their untouched or minimally modified state, play a critical role in preserving biodiversity, maintaining ecological processes, and delivering essential ecosystem services. These areas act as refuges for rare and endangered species, support genetic diversity, and facilitate natural processes that sustain ecosystems and provide essential supporting and regulating services to nearby human populations (Fisher et al. 2009). Beyond ecological benefits, wilderness areas provide invaluable opportunities for scientific research, education, recreation, and spiritual renewal (Carver et al. 2014).

The delineation and assessment of wilderness areas enable effective prioritization of conservation efforts, monitoring of environmental changes over time, and development of sustainable land use policies. The pioneering work in wilderness mapping began in the 1980s with Rob Lesslie and colleagues who utilized early computer-based methodologies (Lesslie and Taylor 1985; Lesslie et al. 1988). Since then, advancements in computing technologies and data accessibility have revolutionized this field, allowing for more comprehensive and detailed studies. The increasing human impact on wilderness areas underscores the urgency for continued research and informed political action, making reliable spatial data more crucial than ever.

Steve Carver *is Professor of Rewilding and Wilderness Science at the School of Geography, University of Leeds, West Yorkshire, LS2 9JT, United Kingdom. Email: s.j.carver@leeds.ac.uk* ***Iurii Strus*** *is GIS and Remote Sensing specialist at Frankfurt Zoological Society – Ukrainian Subsidiary, Lviv, Ukraine. Email: iurii.strus@fzs.org*

Background

In February 2009, the European Parliament adopted the Resolution on Wilderness in Europe (2008/2210(INI)) with a significant majority, signaling broad cross-party support and a strong mandate for action. The resolution called on the European Commission to develop a clear definition of wilderness in Europe, mandate the European Environment Agency (EEA) to map existing wilderness areas, undertake studies on the values and benefits of wilderness, develop a broader EU wilderness strategy, promote the restoration of new wilderness areas, and collaborate with non-governmental organizations and local communities to highlight the value of wilderness (European Parliament 2009).

Following the resolution, a conference organized by Wild Europe in Prague under the Czech Presidency led to the *Message from Prague*, which outlined policy recommendations for the protection and restoration of Europe's wilderness and wild areas. This initiative included a review of wilderness in Europe, the establishment of a unifying definition of wilderness relevant to the European context, and the creation of a register of legally protected wilderness areas. By November 2010, a comprehensive review of the status and conservation of wild land in Europe was completed, and in early 2013, guidelines on wilderness in Natura 2000 were published, providing a formal definition for European wilderness. According to these guidelines, wilderness areas are governed by natural processes, consist of native habitats and species, are large enough to sustain ecological functions, and are free from significant human disturbance and infrastructure (European Commission 2013).

A Wilderness Map for Europe

The Wilderness Quality Index (WQI) was developed as a rigorous tool to map the distribution and quality of wilderness areas, essential for supporting developing policies on wilderness in Europe and addressing global

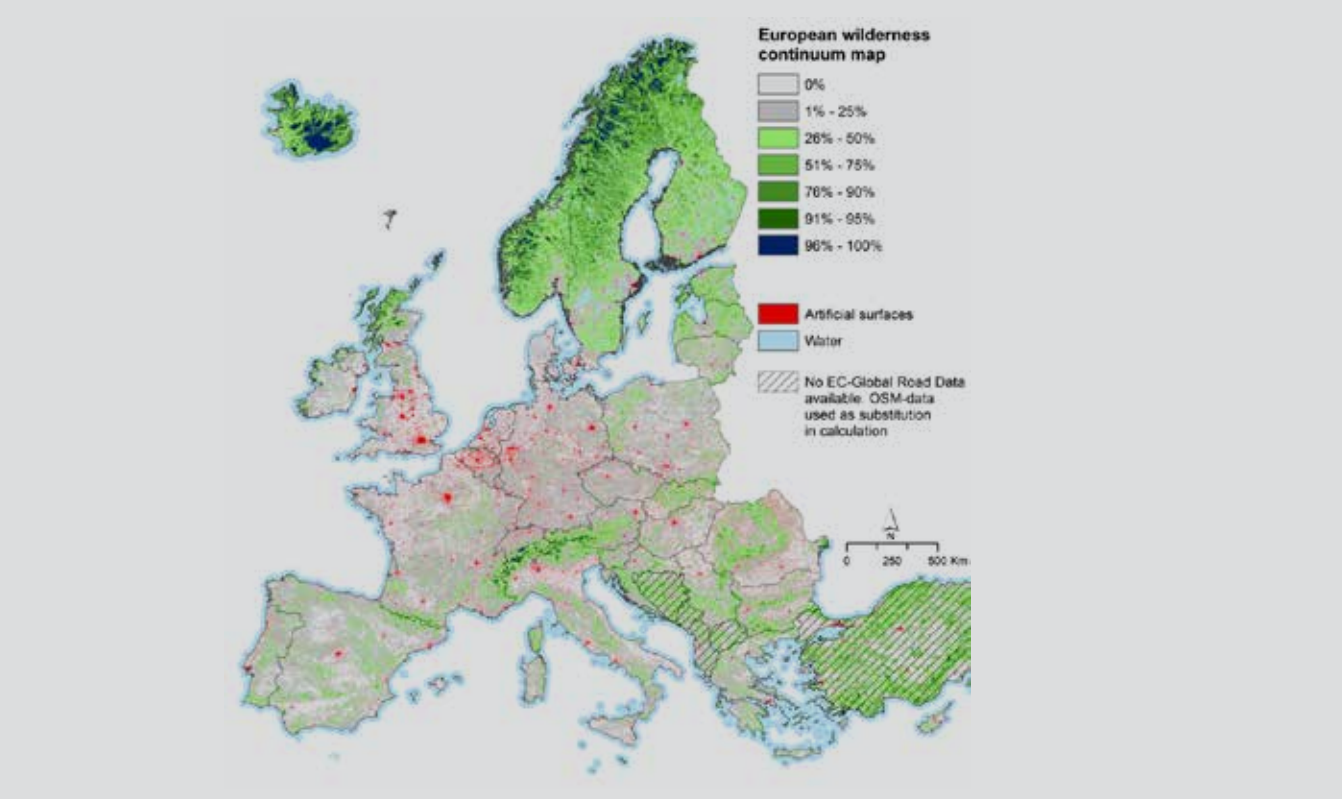


Figure 1 - WQI 1.0 (after Kuiters et al. 2013).

declines in wilderness areas. Early mapping efforts by Carver, presented in the *Europe's ecological backbone* report (EEA 2010) at the Prague conference, formed the foundation for the EU Wilderness Register. This register includes a database of designated wilderness areas, a spatial index of wilderness quality, and an analysis of protected versus unprotected areas across the EU27 and partner states.

The original WQI 1.0, developed for the EEA (Kuiters et al. 2013), is now outdated and limited to the EU27 states as shown in figure 1. There is a pressing need to update this index using current data and to expand its coverage to include all of continental Europe, including non-EU states and Russia west of the Ural Mountains. Recent work by the authors (Strus and Carver 2024) extends the WQI to include Eastern European states such as Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia (European part), and Ukraine. Using the Google Earth Engine, a new updated wilderness index (WQI 2.0) is mapped for the entirety of continental Europe, ensuring a more comprehensive and current understanding of wilderness areas across the region.

Protecting Europe's Top 30% Wildest Areas

The updated wilderness mapping and extended Wilderness Quality Index (WQI 2.0) are directly relevant to the goals of the Kunming–Montreal Global Biodiversity Framework and its ambitious 30x30 targets. The Kunming–Montreal agreement, adopted at the 15th Conference of the Parties (COP15) to the Convention on Biological Diversity in 2022, aims to protect 30% of the world's land and ocean areas by 2030 (CBD 2022). The Kunming–Montreal Global Biodiversity Framework commits signatories to 23 action-oriented global targets by 2030. Key targets include:

- *Target 1:* Reduce threats to biodiversity by using effective spatial planning to minimize the loss of high biodiversity areas to nearly zero by 2030.
- *Target 2:* Ensure that by 2030, at least 30% of degraded land and water (including freshwater, coastal, and marine ecosystems) are under effective restoration to enhance biodiversity, ecosystem functions, services, ecological integrity, and connectivity.
- *Target 3:* Ensure and enable that by 2030, at least 30% of land and water, especially areas of high importance for biodiversity and ecosystem functions and services, are effectively protected.

The framework emphasizes the need for ecologically representative, well-connected, and equitably governed systems of protected areas, recognizing Indigenous and traditional territories. Achieving these targets requires assessing the status of existing protected areas and identifying additional regions that can contribute to the 30% goal. This involves spatial planning and analysis to pinpoint high biodiversity areas that are currently unprotected. Success depends on integrating ecological, social, and political considerations, ensuring inclusive conservation measures that support global biodiversity goals. Accurate mapping and comprehensive data on wilderness areas are therefore essential for identifying and prioritizing regions for conservation under these targets.

The post-2020 Global Biodiversity Framework by the Convention on Biological Diversity (CBD 2021) prioritizes "retaining wilderness areas" as the first of 21 action-oriented targets for 2030. Wilderness areas, characterized by minimal human modification or disturbance, are recognized for their ability to safeguard biodiversity at significant levels within various ecosystems and biogeographic regions (Dymond et al. 2003). Focusing conservation efforts on these least modified areas aligns with achieving the ambitious 30% protection targets outlined in the Kunming–Montreal Agreement.

The WQI 2.0 provides detailed and updated spatial information on the quality and distribution of wilderness areas across continental Europe and gives policymakers the required information to support decisions to achieve conservation goals. It ensures that areas critical for biodiversity, ecological processes, and ecosystem services are recognized and protected. This aligns with the global commitment to halt biodiversity loss and foster sustainable land use, supporting the broader objectives of the Kunming–Montreal agreement. By integrating this rigorous mapping approach, Europe can contribute significantly to the global effort to conserve wilderness and achieve the 30x30 targets, demonstrating a scalable model for other regions worldwide.

However, Targets 1–3 of the Kunming–Montreal Agreement lack specific details on which areas to protect and how to identify them. Here we address these questions through spatially explicit exploration of patterns of WQI across Europe. Key research questions include:

1. How should the 30% of land and sea designated for restoration or protection be selected to inform regional and national-level decisions effectively?
2. To what extent do current protected areas contribute to meeting these targets?
3. How feasible is it to expand protected area networks to fulfil global biodiversity commitments?

In answering these questions, we aim to provide practical insights into achieving the Kunming–Montreal targets by strategically identifying and prioritizing areas for conservation and restoration efforts across Europe, thereby contributing to global biodiversity conservation goals more effectively.

Methods

The analysis described for updating the Wilderness Quality Index (WQI) 2.0 for the Wilderness Register builds on the methodology used for the first EU WQI 1.0 (Strus and Carver 2024). The WQI is derived from a weighted linear combination of three main factors: naturalness of land cover, remoteness from access, and remoteness from population.

Naturalness of Landcover

This layer uses the reclassified European Space Agency (ESA) WorldCover 10 m landcover data from 2020 due to its comprehensive pan-European coverage, fine resolution, and recent production date. Unlike the original WQI 1.0, which relied on the more detailed Coordination of Information on the Environment (CORINE) landcover data (not available for non-EU Eastern European countries), this approach reclassifies landcover classes into naturalness scores ranging from 1 to 10. For instance, forests, despite their potential artificial or managed origins, were scored 9 due to the diverse types of management across Europe, with primary forests (from the European primary forest database v2.0) rated 10. Grasslands' naturalness scores were adjusted based on grazing intensity data from the Food and Agriculture Organization Gridded Livestock of the World (FAO GLW) dataset. Areas with high grazing intensity received lower scores. Water bodies were masked, and the numerical naturalness scores assigned to the remaining landcover classes (which originally ranged from 1 to 10) were then linearly rescaled to a 0–1 range for uniformity before being combined with other model inputs.

Remoteness from Mechanized Access

Remoteness from mechanized access was calculated as a cost–distance surface, representing the minimum travel time from roads to other locations. The analysis began with reclassified ESA WorldCover 10 m landcover data, which was converted into travel time values for crossing terrain at normal walking speeds, factoring in different speeds for various landcover types (e.g., 2 km/h for wetlands, 3 km/h for forests). Topographical impacts on travel speed were included using Scarf's formula based on Naismith's rule, derived from the Multi-Error-Removed Improved-Terrain Digital Elevation Model (MERIT DEM) (Scarf 2007; Naismith 1892). The friction surface was further refined with road network data from OpenStreetMap (OSM), setting a maximum distance for cost calculations at 20 km to enhance calculation speed. The final raster was adjusted to show areas more than three hours from roads as having the highest remoteness values. Different road classes were weighted and combined, with trunk roads having the highest weight.

Remoteness from Population

Similar to remoteness from access, remoteness from population was also calculated as a cost–distance surface. This included travel times on roads, with speeds set according to road type (110 km/h for trunk roads). Settlement boundaries from OSM and additional residential roads were used to minimize missed settlements. Night light data from the Visible Infrared Imaging Radiometer Suite (VIIRS) and population density data from the Center for International Earth Science Information Network (CIESIN) were incorporated, with thresholds set at 30 nanoWatts/cm²/sr for night lights and 1,000 people/km² for population density. These were combined and weighted to create a final "remoteness from population" raster, ensuring that highly populated areas received lower remoteness scores.

Calculating the WQI 2.0

The final Wilderness Quality Index (WQI 2.0) was computed as an equal-weighted linear combination of three factors: naturalness of landcover, remoteness from access, and remoteness from population, focusing on the European continent. The analysis was conducted entirely on the Google Earth Engine platform using various data sources, including imported assets such as OSM layers for roads, rivers, settlements, primary forests from Sabatini et al. (2018; 2021), and FAO GLW data. The final WQI map was masked to the area of interest and exported for further use.

Mapping 30x30 Targets

Target 3 states that we should "ensure and enable that by 2030 at least 30% of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas". Beyond the stated 30% target, the text of the agreement provides little detail on how such targets are to be achieved and where.

We use the WQI 2.0 to identify the top 30% wildest areas across continental Europe and then disaggregate these to further explore the top 30% wildest areas by country and by biogeographical regions. These patterns are cross-referenced with International Union for Conservation of Nature and Natural Resources (IUCN) and Other

Effective area-based Conservation Measures (OECMs) to identify those areas with notable wilderness qualities, but which might benefit from additional protection. We investigate the categorization of these areas in terms of their existing land use as a measure of how realistically achievable additional protection might be without displacing existing economic activity and/or settlement.

Target 2 states that we should "ensure that by 2030 at least 30% of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity." Again, the text of the agreement provides little detail on how this target is to be achieved or how areas for restoration are to be identified.

We explore using the component attributes of WQI 2.0 to pinpoint locations for restoration. Improvements in one or more model input layers, achieved through on-the-ground measures, could help meet Target 2. This is particularly relevant for modifying and reducing land use impacts in areas of marginal economic activity. These findings could be used to assess the geographical options of the new EU Nature Restoration Law and targets to restore at least 2 % of land and sea by 2030 (European Parliament 2024).

By using a combination of WQI 2.0 and EEA Biogeographical Regions we are able to spatially delimit the top 30% least impacted areas across Europe, within each European country, and within each of the European biogeographic regions. Calculations are performed using normalized WQI 2.0 values and an equal area model. We then use the World Database on Protected Areas (WDPA) to identify IUCN Categories 1, 2, 3, 4, and 6 protected areas to identify their overlap with the top 30% at each scale and identify areas in the top 30% at each scale without IUCN protected area designations. We use Copernicus Global Land Cover Layers—CGLS-LC100 Collection 3 at 100 m resolution—as a base landcover/land use layer and modify forested areas from there using the forest management dataset by Lesiv et al. (2022) to identify land use patterns within those areas without protection and create plots of land cover within unprotected areas at European scale.

Figure 2 - WQI 2.0.

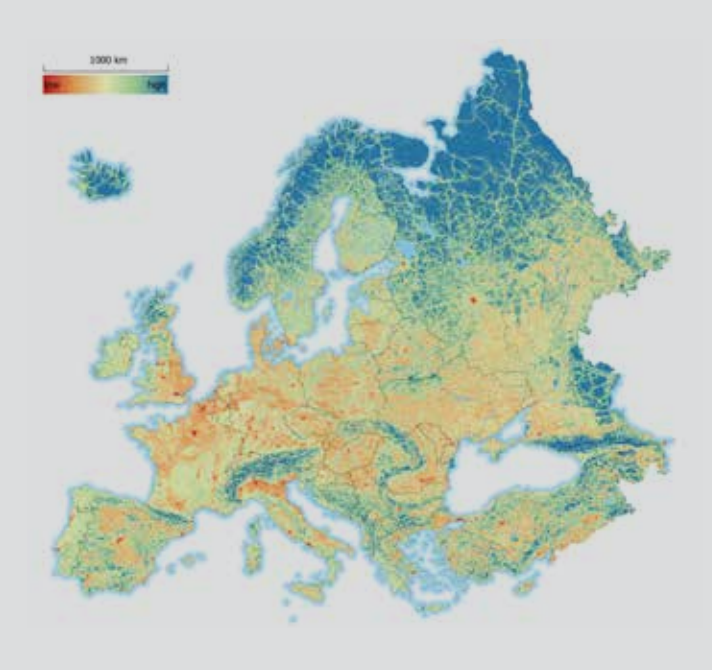


Figure 3 - Wildest areas of continental Europe (drawn from a single distribution).

Results and Discussion

The new WQI 2.0 highlights distinct longitudinal and latitudinal gradients in wilderness distribution across Europe, with higher wilderness quality indices observed in the northern and eastern regions. Additionally, there is a strong correlation between wilderness quality and altitude, with higher values prevalent in mountainous areas. These trends can clearly be seen in Figures 2 and 3.

The analysis indicates significant variations in wilderness quality across different protected area designations. Higher wilderness quality indices are found in lands under IUCN Categories 1a, 1b, and 2, which include strict nature reserves, wilderness areas, and national parks. Sites within the Emerald Network, aimed at conserving valuable and threatened habitats and species in non-EU countries, also show high wilderness quality. However, Natura 2000 sites, designated for protecting habitats and species of European importance within the EU, do not exhibit a significant increase in wilderness quality index values. This is shown in the boxplots in Figure 4.

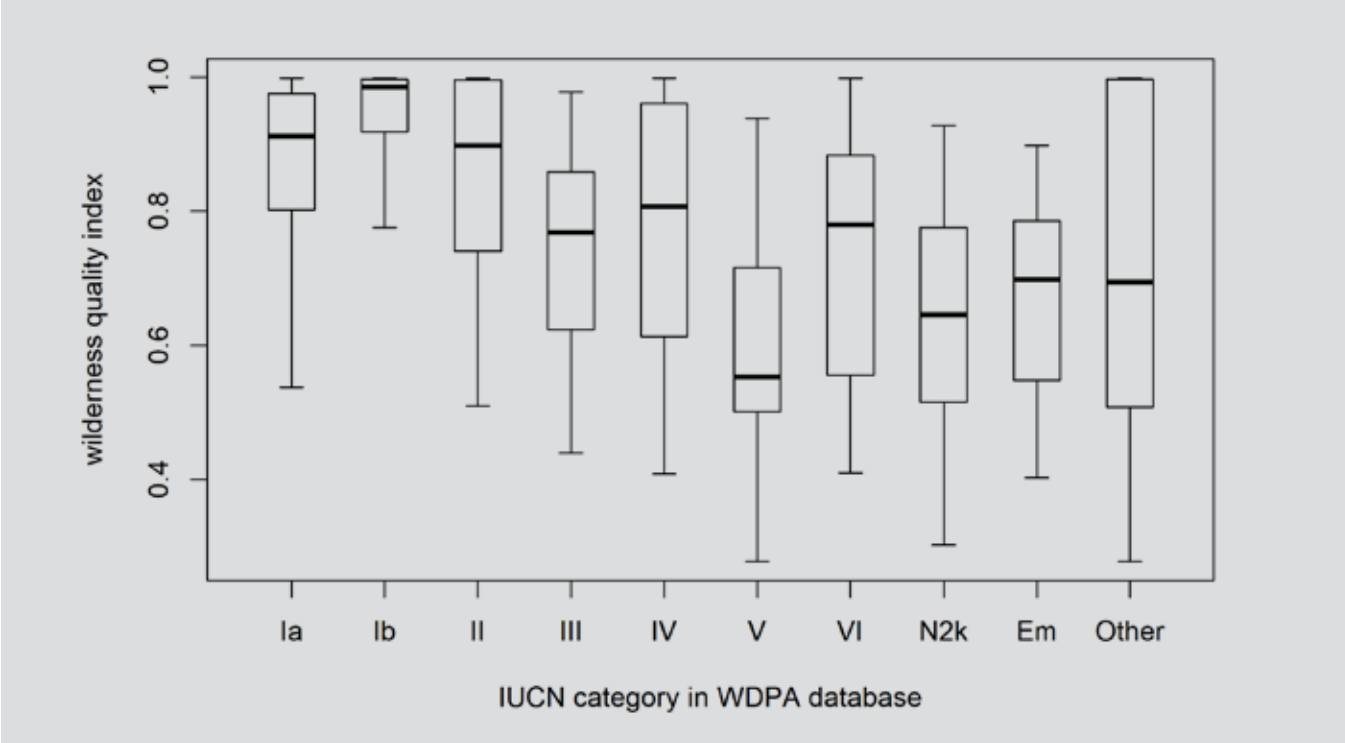


Figure 4 - Distribution of WQI across protected areas of different IUCN status (based on WDPA dataset). N2k: Natura 2000 network; Em: Emerald network.

These findings suggest that stricter protection categories and targeted conservation networks are more effective in preserving wilderness quality, while the Natura 2000 sites may require additional measures to enhance their wilderness attributes.

The distribution of wild lands across European countries aligns with the longitudinal, latitudinal, and altitudinal gradients, showing higher proportions of wild lands in mountainous and northern regions. This pattern reflects the impact of rugged terrain, colder climates, and historical land use. Countries with these characteristics tend to exhibit more wilderness areas as shown in Table 1.

The updated Wilderness Quality Index (WQI 2.0) shows a strong correlation with its predecessor, WQI 1.0 from the Wilderness Register (Pearson correlation, based on 10,000 random samples; $r = 0.76$, $p < 0.001$), indicating consistency in wilderness quality assessment. Additionally, WQI 2.0 correlates significantly with the

Name of the biogeographic region	Top 30% wildest areas estimated within Europe, km^2	Top 30% wildest areas estimated within each biogeographic region separately, km^2
boreal	1,377,409	814,832
alpine	618,845	286,205
arctic	347,965	118,795
steppic	233,396	341,711
mediterranean	182,266	353,611
continental	168,360	757,881
anatolian	111,845	131,793
atlantic	62,675	254,181
Black Sea	45,875	44,151
pannonian	1,622	47,367

Table 1 - Distribution of top 30% wildest areas in Europe across biogeographic regions.

recent Wildlife Conservation Society (WCS) human modification index map (resampled, inverted, and rescaled to unit scale; $r = 0.70$, $p < 0.001$). The strong correlation between these datasets ($r = 0.81$, $p < 0.001$) further validates the reliability of the new index.

These findings underscore the effectiveness of using robust and updated metrics for wilderness quality assessment, ensuring accurate identification and conservation of wild lands across Europe. The consistency between different indices highlights the stability and reliability of the methodologies used in wilderness mapping.

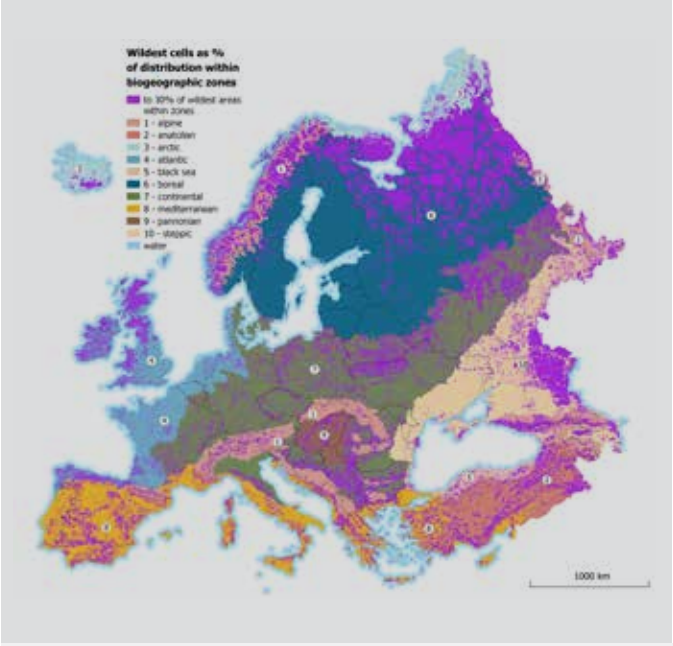


Figure 5 - Wildest areas (top 30%) of continental Europe, estimated within biogeographic regions (separate distributions for each region).

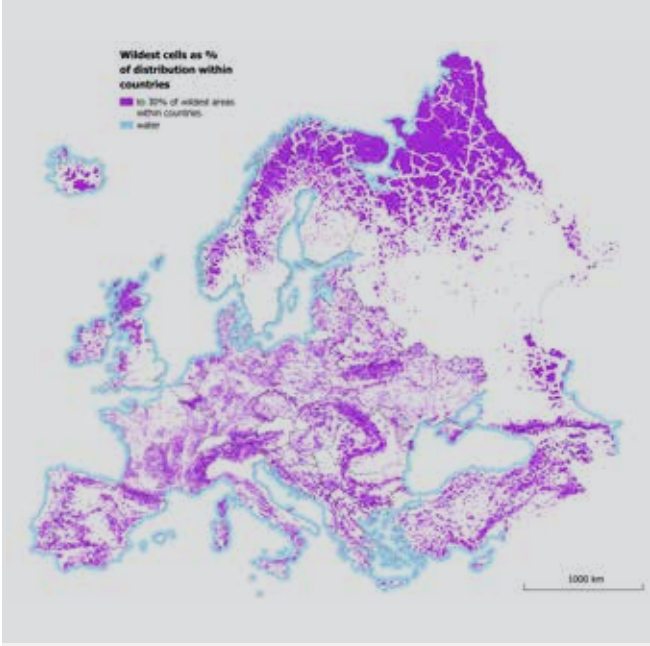


Figure 6 - Wildest areas (top 30%) of continental Europe, estimated within countries (separate distributions for each country).

Country	Distribution of top 30% wildest areas across biogeographical regions, %									
	alpine	anatolian	arctic	atlantic	Black Sea	boreal	continental	mediterranean	pannonian	steppic
Albania	42	-	-	-	-	-	-	58	-	-
Armenia	80	20	-	-	-	-	-	-	-	-
Austria	99	-	-	-	-	-	1	-	-	-
Azerbaijan	47	8	-	-	-	-	-	-	-	45
Belarus	-	-	-	-	-	39	61	-	-	-
Belgium	-	-	-	17	-	-	83	-	-	-
Bosnia and Herzegovina	75	-	-	-	-	-	11	14	-	-
Bulgaria	43	-	-	-	6	-	52	-	-	-
Croatia	35	-	-	-	-	-	34	31	-	-
Cyprus	-	-	-	-	-	-	-	100	-	-
Czechia	-	-	-	-	-	-	98	-	2	-
Denmark	-	-	-	37	-	-	63	-	-	-
Estonia	-	-	-	-	-	100	-	-	-	-
Finland	15	-	-	-	-	85	-	-	-	-
France	14	-	-	28	-	-	41	17	-	-
Georgia	80	-	-	-	14	-	-	-	-	6
Germany	3	-	-	16	-	-	81	-	-	-
Greece	-	-	-	-	-	-	-	100	-	-
Guernsey	-	-	-	100	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	1	-	99	-
Iceland	-	-	100	-	-	-	-	-	-	-
Ireland	-	-	-	100	-	-	-	-	-	-
Isle of Man	-	-	-	100	-	-	-	-	-	-
Italy	39	-	-	-	-	-	12	49	-	-
Jersey	-	-	-	100	-	-	-	-	-	-
Latvia	-	-	-	-	-	100	-	-	-	-
Lithuania	-	-	-	-	-	100	-	-	-	-
Luxembourg	-	-	-	-	-	-	100	-	-	-
Moldova	-	-	-	-	-	-	70	-	-	30
Montenegro	76	-	-	-	-	-	-	24	-	-
Netherlands	-	-	-	100	-	-	-	-	-	-
North Macedonia	55	-	-	-	-	-	45	-	-	-
Norway	94	-	2	4	-	-	-	-	-	-

Table 2 - Distribution of top 30% wildest areas in Europe across biogeographic regions shown by country (the statistic is calculated country by country).

Country	Distribution of top 30% wildest areas across key landcover types, %											
	bare/sparse vegetation	cultivated and managed vegetation	herbaceous vegetation	herbaceous wetland	heavily managed forests	natural forests without major management	managed forests with natural renewal	oceans, seas	permanent water bodies	shrubs	snow and ice	urban
Albania	-	2	32	-	2	-	52	-	-	12	-	-
Armenia	-	-	84	-	-	2	13	-	-	-	-	-
Austria	3	-	45	-	7	-	42	-	-	-	2	-
Azerbaijan	3	9	65	1	-	4	18	-	-	-	-	-
Belarus	-	12	3	7	33	-	46	-	-	-	-	-
Belgium	-	28	18	-	32	-	20	-	-	-	-	2
Bosnia and Herzegovina	-	5	15	-	10	2	66	-	-	2	-	-
Bulgaria	-	6	6	-	14	-	70	-	-	2	-	-
Croatia	-	6	5	-	6	1	72	-	-	9	-	-
Cyprus	-	7	20	-	3	-	43	-	-	26	-	-
Czechia	-	32	1	-	39	-	28	-	-	-	-	-
Denmark	-	62	2	2	25	-	3	2	1	-	-	2
Estonia	-	6	2	8	13	-	70	1	-	-	-	-
Finland	-	-	14	6	3	33	39	-	2	3	-	-
France	1	17	24	-	17	-	37	-	-	3	-	-
Georgia	4	-	54	-	3	5	31	-	-	-	3	-
Germany	-	36	6	-	37	-	18	-	1	-	-	2
Greece	-	2	14	-	13	-	53	-	-	16	-	-
Guernsey	-	40	-	-	7	-	7	33	-	-	-	13
Hungary	-	45	1	1	9	-	42	-	-	-	-	1
Iceland	27	-	39	-	-	-	-	-	-	-	33	-
Ireland	-	1	92	-	6	-	-	1	1	-	-	-
Isle of Man	-	1	89	-	5	-	-	5	-	-	-	-
Italy	1	3	21	-	8	-	56	-	-	10	1	-
Jersey	-	63	-	-	-	-	4	21	-	-	-	13
Latvia	-	8	1	4	13	-	73	-	1	-	-	-
Lithuania	-	26	1	1	20	-	49	-	1	-	-	-
Luxembourg	-	44	14	-	13	-	27	-	-	-	-	1
Moldova	-	72	4	1	8	-	12	-	1	-	-	3
Montenegro	-	4	37	1	5	-	51	-	-	2	-	-
Netherlands	-	75	6	2	11	-	2	1	1	-	-	1
North Macedonia	-	1	22	-	2	-	67	-	-	7	-	-
Norway	8	-	82	-	-	2	1	-	1	1	4	-
Poland	-	30	2	1	49	-	18	-	1	-	-	-
Portugal	-	8	23	-	27	-	17	-	1	25	-	-
Romania	-	7	7	4	17	-	65	-	-	-	-	-
Russian Federation	-	1	21	11	-	30	34	-	1	1	-	-
San Marino	-	6	-	-	50	-	39	-	-	6	-	-
Serbia	-	5	7	-	6	-	81	-	-	1	-	-
Slovakia	-	4	4	-	15	-	76	-	-	-	-	-
Slovenia	-	4	7	-	16	-	72	-	-	-	-	-
Spain	-	6	17	-	19	-	41	-	-	16	-	-
Sweden	1	-	35	1	2	26	29	-	2	3	-	-
Switzerland	11	-	62	-	-	-	15	-	-	-	12	-
Turkey	1	2	57	-	8	-	27	-	-	4	-	-
Ukraine	-	34	13	4	23	1	23	-	-	-	-	1
United Kingdom	-	3	90	-	6	-	-	1	-	-	-	-

Table 3 - Distribution of top 30% wildest areas in Europe across main landcover classes shown by country (top 30% WQI cells defined for each country separately).

Figure 5 shows the distribution of the top 30% wildest areas drawn from within the representative biogeographical regions/biomes for Europe. By drawing the top 30% within these biomes we can reasonably avoid the bias towards the northern latitudes and high altitudes as seen in the whole of Europe map (Figure 3). This bias is shown in table 1 where the top 30% wildest areas across the whole of Europe and their respective biomes are next to the top 30% areas within each biome.

From a purely political perspective we might also map the top 30% wildest areas by country such that each nation in Europe can identify those areas where it can meet its 30x30 targets. The top 30% wildest areas by country are shown in Figure 6. Table 2 shows the distribution of top 30% wildest areas in Europe across biogeographic regions shown by country (the statistic is calculated country by country).

Table 3 shows the distribution of top 30% wildest areas in Europe across main landcover classes shown by country (top 30% WQI cells defined for each country separately). This is an attempt to demonstrate the availability of land in meeting 30x30 targets based on existing land cover/use statistics. It is reasonable to expect that land within that top 30% that is forested, or wetland could easily be designated as part of the 30x30 targets, whereas land that is within the top 30% but is classified as cultivated or heavily managed might be less easy to designate.

The final table in this analysis is table 4. This shows the overlap of top 30% wildest areas in Europe with protected areas according to WDPA dataset (top 30% WQI cells defined for each biogeographic zone separately). While we acknowledge that certain protected areas overlap and therefore, some of the area that is protected has essentially been double counted, there are significant areas within the top 30% across Europe that are currently without protection. These *de facto* wilderness areas carry all of the attributes of being the wildest areas yet they are not formally protected in law and so remain vulnerable to human pressure.

Biogeographic zones	Overlap with protected areas of different IUCN categories, %										Total overlap with protected areas[b], %	Not protected, %
	Ia	Ib	II	III	IV	V	VI	N2k	Emerald	Other[a]		
alpine	3.8	9.8	14.8	0.1	6.5	4.2	0.2	3.2	0.2	7.4	50.2	49.8
anatolian	0.1	0.0	0.3	0.0	1.0	0.0	0.2	0.0	0.0	0.0	1.7	98.3
arctic	0.1	0.1	7.7	0.1	5.5	0.1	0.0	0.0	0.0	3.6	17.3	82.7
atlantic	0.6	0.0	1.3	0.2	10.6	11.7	0.6	6.4	0.0	0.3	31.7	68.3
Black Sea	0.5	0.0	4.6	0.0	4.1	1.1	0.0	1.4	0.0	1.6	13.3	86.7
boreal	0.5	1.8	1.1	0.1	7.5	0.0	0.0	0.1	0.0	1.5	12.7	87.3
continental	0.8	0.0	1.7	0.3	4.4	6.4	0.0	8.1	3.0	2.5	27.2	72.8
mediterranean	0.1	0.1	3.2	0.3	8.0	5.1	2.8	15.1	0.0	0.2	34.9	65.1
pannonian	0.1	0.0	5.0	0.1	5.5	11.6	0.1	19.3	0.2	0.1	42.0	58.0
steppic	0.6	0.0	2.0	0.5	5.0	0.0	1.4	0.2	2.0	0.6	12.4	87.6

[a]About 44% objects in the WDPA database have IUCN_CAT values set to "Not Reported", "Not Assigned" or "Not Applicable", which were converted to proper IUCN categories, or labelled Natura2000/Emerald; this reduced total proportion of "Not Assigned" or "Not Applicable" to 19%.

[b]Those available as polygons in the WDPA dataset as of June 2024.

Table 4 - Overlap of top 30% wildest areas in Europe with protected areas according to WDPA dataset (top 30% WQI cells defined for each biogeographic zone separately).

Conclusions

The COP15 Kunming–Montreal Agreement represents a pivotal global commitment, encapsulated in the 30x30 vision, to safeguard and restore at least 30% of the world's land and sea by 2030. While the agreement sets ambitious goals, its successful implementation hinges on tailored regional and national approaches. Our work using the Wilderness Quality Index (WQI) 2.0 aims to provide a spatially explicit framework to support these efforts in Europe.

Informing the Selection of Areas for 30x30 Protection and Restoration Targets

A key challenge of the Kunming–Montreal Agreement is how the 30% of land and sea designated for protection or restoration should be selected. Our WQI 2.0 provides a robust, data-driven method to identify the top 30% wildest areas across continental Europe, and can be disaggregated to inform decisions at national and biogeographical scales (addressing research question 1). This spatial prioritization is crucial for effectively targeting conservation efforts. Furthermore, as explored in our methodology, the component attributes of WQI 2.0 (naturalness, remoteness from access, and remoteness from population) offer potential for identifying areas where targeted improvements through on-the-ground measures could deliver on Target 2 (restoration), particularly by scaling back land use impacts in areas of marginal economic activity. This aligns with initiatives like the EU Nature Restoration Law.

Assessing the Contribution of Existing Protected Areas and Identifying Gaps

Understanding the extent to which current protected areas contribute to the 30x30 targets (research question 2) is vital. Our analysis, by cross-referencing WQI 2.0 with IUCN categories and OECMs (as exemplified in Figure 4), allows for an assessment of how well existing protected areas align with Europe's wildest landscapes. Importantly, this approach also identifies "*de facto* wilderness" areas—those exhibiting high wilderness qualities but currently lacking formal protection (highlighted in the discussions around table 4)—which represent significant opportunities for expanding the protected area network.

Feasibility and Challenges in Meeting European Commitments

The feasibility of expanding protected area networks to fulfil global biodiversity commitments (research question 3) varies across Europe. Our findings indicate that Scandinavian countries and mountainous regions (e.g., Austria, Switzerland, and Romania) demonstrate favorable conditions for achieving the 30% target due to lower human impact. However, achieving these targets is fraught with challenges. Governance complexities, including national targets and the need for transboundary cooperation, pose significant hurdles. The intricate relationships between species and their habitats necessitate careful consideration. Conflicts arising from existing land uses, particularly in smaller countries and biogeographical zones with higher human population densities, underscore the need for sustainable land management practices that respect Indigenous land rights and cultural values. Moreover, securing adequate financing through mechanisms like green financing and Natural Capital Assessments is pivotal.

The Path Forward: Spatial Intelligence for Biodiversity Goals

The interplay of ecological, governance, societal, economic, and political factors underscores the complexity of implementing the 30x30 targets. Detailed spatial assessments, such as those provided by WQI 2.0, are essential for informing strategic decisions by governments and international bodies. They provide the necessary intelligence to strengthen existing protected areas and strategically expand conservation efforts. In conclusion, while the Kunming–Montreal Agreement sets forth clear goals, the path to achieving them is multifaceted. Emphasizing the spatial dimensions of conservation planning, supported by tools like WQI 2.0, is crucial for effectively addressing the diverse challenges and opportunities presented by the 30x30 vision within the Global Biodiversity Framework.

References

Carver, S.; McCool, S.; Krenova, Z.; [et al.]. 2014. Fifty years of wilderness science: An international perspective. International Journal of Wilderness. 20(2): 36–42.

CBD. Convention on Biological Diversity. 2021. First draft of the Post-2020 Global Biodiversity Framework. CBD/WG2020/3/3. Secretariat of the Convention on Biological Diversity, Montréal, Canada. https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf [Accessed 2025 July 27]

CBD. Convention on Biological Diversity. 2022. Kunming–Montreal Global Biodiversity Framework. CBD/COP/DEC/15/4. Secretariat of the Convention on Biological Diversity, Montréal, Canada. https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf [Accessed 2025 July 1]

Dymond, C.; Carver, S.; Phillips, O. 2003. Investigating the environmental cause of global wilderness and species richness distributions. In: Science and Stewardship to Protect and Sustain Wilderness Values: Seventh World Wilderness Congress Symposium, 2001 November 2–8, Port Elizabeth, South Africa. Proceedings RMRS-P-27. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 231–237.

EEA. European Environment Agency. 2010. Europe's ecological backbone: recognising the true value of our mountains. EEA Report No. 6/2010. https://www.eea.europa.eu/publications/europes-ecological-backbone [Accessed 2023 January 19].

European Commission. 2013. Guidelines on wilderness in Natura 2000. Management of terrestrial wilderness and wild areas within the Natura 2000 network. Technical Report-2013-069, prepared with the assistance of Alterra, PAN Parks Foundation and Eurosite. https://data.europa.eu/doi/10.2779/33572. [Accessed 2024 July 30 July].

European Parliament. 2009. European Parliament Resolution of 3 February 2009 on Wilderness in Europe (2008/2210(INI)). Vol. C 67 E/1.

European Parliament. 2024. Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869. PE/74/2023/REV/1.

Fisher, B.; Turner, R.K.; Morling, P. 2009. Defining and classifying ecosystem services for decision making. Ecological economics. 68(3): 643–653.

Kuiters, A.T.; van Eupen, M.; Carver, S. [et al.]. 2013. Wilderness register and indicator for Europe Final Report. EEA Contract No 0703072011610387 SERB3. Copenhagen, Denmark: European Environment Agency.

Lesiv, M.; Schepaschenko, D.; Buchhorn, M. [et al.]. 2022. Global forest management data for 2015 at a 100 m resolution. Scientific Data. 9(1): 199.

Lesslie, R.G.; Taylor, S.G. 1985. The wilderness continuum concept and its implications for Australian wilderness preservation policy. Biological Conservation. 32(4): 309–333.

Lesslie, R.G.; Mackey, B.G.; Preece, K.M. 1988. A computer-based method of wilderness evaluation. Environmental Conservation. 15(3): 225–232.

Naismith, W.W. 1892. Cruach Ardran, Stobinian, and Ben More. The Scottish Mountaineering Club Journal. 1892. 2: 135–136.

Sabatini, F.M.; Burrascano, S.; Keeton, W.S. [et al.]. 2018. Where are Europe's last primary forests? Diversity and distributions. 24: 1426–1439.

Sabatini, F.M.; Bluhm, H.; Kun, Z. [et al.]. 2021. European primary forest database v2.0. Scientific Data. 8(1): 220.

Scarf, P. 2007. Route choice in mountain navigation, Naismith's rule, and the equivalence of distance and climb. Journal of Sports Sciences. 25(6): 719–726.

Strus, I.; Carver, S. 2024. Developing a Wilderness Quality Index for continental Europe. Land. 13(4): 428.

Section 4

Collaboration, Partnerships, and Community Conservation

Sharing and Learning:
Indigenous Perspectives on Ranger and Community Relationships

BY SUE STOLTON, HANNAH L. TIMMINS, NIGEL DUDLEY, MÓNICA ÁLVAREZ MALVIDO, and DUSTY VAUGHN

Abstract

The role of rangers in protected area management has evolved from traditional enforcement to a complex, community-centred approach based around building trust and respect with local communities. At the WILD 12 Congress, new ranger-led IUCN WCPA Good Practice Guidelines on "Building Trust between Rangers and Communities" were introduced. The Guidelines present practical strategies rangers can take to foster better relationships with communities, strengthen professional skills, address cultural sensitivities, and align conservation efforts with social equity. This paper outlines the guidelines and the discussions at the session "Sharing and learning: Indigenous perspectives on ranger and community relationships" at WILD 12. The paper notes the comments by Rosebud Sioux councillor Christopher Eagle Bear who shared how rangers protect the reservation's lands, resources, and wildlife with limited funding. He emphasised the cultural and environmental significance of these efforts, particularly in managing hunting pressures, fostering community engagement, and preserving Indigenous identity. The global demand for rangers is increasing significantly, with approximately 286,000 rangers currently working in protected areas—far below the estimated 1.5 million needed to conserve 30% of the planet by 2030, called for by the Convention on Biological Diversity's Global Biodiversity Framework. This paper notes that supporting these conservation goals requires a clear, strategic approach to ranger recruitment and training.

Introduction

Managing protected areas is not just about conserving species and ecosystems; it has a major social dimension. There is now widespread awareness among protected areas managers and agencies of the necessity and obligation to respect the rights of those using and living in or around protected areas, to resolve disputes, address grievances, prevent misconduct, and embrace much more collaborative and equitable forms of governance (Woodside et al 2021; Springer et al 2021). Protected area rangers are at the frontline of these interactions.

Addressing issues of policy, governance, and rights can be frustratingly slow however, and may be beyond the scope of the work and powers of rangers and community members. Yet, while the big issues are being resolved, there is much that can be done, and is being done, at the site level to maintain and improve relations between protected areas and local people.

Sue Stolton, Nigel Dudley, and Hannah L. Timmins *are all members of Equilibrium Research and IUCN WCPA.* ***Hannah L. Timmins*** *is also a member of the WCPA Wilderness Specialist Group.* ***Dusty Vaughn*** *is the Scouting Liaison Specialist at the National Wilderness and Wild & Scenic Rivers, Forest Service, Washington Office.* ***Sue Stolton*** *is the corresponding author. Email: sue@equilibriumresearch.com* ***Monica Alvarez Malvido*** *is the Federation Development Officer for the International Ranger Federation*

IUCN WCPA Good Practice Guidelines

The recently published Good Practice Guidelines on *Building Trust between Rangers and Communities* (Stolton et al. 2024) from the International Union for Conservation of Nature and Natural Resources (IUCN) World Commission on Protected Areas (WCPA) provide clear, positive practical guidance and real examples of how rangers can work with Indigenous Peoples and local communities to build trust, cooperation, and neighbourliness, to prevent and resolve conflicts, and to find common purpose in addressing threats to nature, people, and culture. This is the first volume in the WCPA Good Practice Guidelines series that is predominantly written by rangers and for rangers. The editors worked with partners to collect good practices and stories from rangers worldwide, reflecting global experience and lessons learned.

The guidelines recognise that ranger roles are changing. As the number of rangers grows, their skills and professionalism will also need to grow, as will the "diplomacy" aspects of their work in many jurisdictions (Woodside et al. 2021). A continuing challenge for rangers is that in many places they are seen primarily as law enforcement officers, whereas their work usually encompasses a wide range of other activities including monitoring, community development, nature-based tourism, education, fire management, invasive species control, and, most recently, disease containment and monitoring. Rangers are often perceived as only protecting biodiversity, while in reality in many cases they are often also securing ecosystem services, cultural heritage, and peoples' rights (Stolton et al. 2023; International Ranger Federation and the Universal Ranger Support Alliance 2023). Indeed, over 90% of rangers say they engage with Indigenous Peoples and local communities at least some of the time, however only 22% of rangers who work alongside Indigenous Peoples and local communities have received training on their needs, lifestyle, priorities, or culture, in order to enhance collaboration (IRF 2024).

Figure 1 - Mónica Álvarez Malvido outlines the 2019 Chitwan declaration on ranger needs, the second point being the need to build better, more trusting relationships with communities (photo: Hannah L. Timmins).

The almost 80 good practices in the guidelines are practical and achievable for most protected areas and their personnel. They do not rely on large investments, or on major changes in law and policy, but rather on thinking and doing things a little differently and adjusting established ways of working. They have all been applied successfully somewhere in the world, and most, adapted to the local context, could be adopted almost anywhere else. They are not designed to resolve long standing grievances and disputes over rights, ownership, and injustices. But if applied in everyday working conditions, they can improve the day-to-day lives of rangers and communities alike, and build the foundation of trust, respect, and peaceful relations that are essential for the bigger, systemic changes to take root (Stolton et al. 2024).

The guidelines start with a discussion about the need for a human rights-based approach in conservation management and the concept of trust. The longest and most important section outlines 79 good practices (subdivided into eight principles, see below). Each good practice draws on real-life examples, sometimes supported by a short case study or ranger story, where a ranger explains the good practice. A third section proposes a modular approach to applying the good practices, starting with understanding the situation and the different types of trust. A guide is provided on identifying which good practices would be relevant to a given situation and making an action plan. Advice is also given about options for training (Stolton et al. 2024).

In addition to the PDF publication (free to download at : https://portals.iucn.org/library/node/51568), the editors collected a series of video interviews with rangers and local communities to bring the subject more to life (available at: https://www.youtube.com/watch?v=n2Mlzrg4u1M&list=PLqajCqmAHDBf7Vmw4nntiCM5_LXhsOxzh).

Figure 2 - Christopher Eagle Bear talks about the importance of local rangers in protecting local resources (photo: Mónica Álvarez Malvido).

Building Trusting Relationships

Conservation is far more likely to be successful if carried out in an environment of trusting relationships. Similarly, an understanding of how to predict, prevent, and manage social conflicts and breakdowns in trust that can arise when working with diverse stakeholder groups can help partners reach equitable solutions in conservation (Dietsch et al. 2021).

"Trust" describes a relationship in which one person (the trustor) accepts vulnerability (i.e., the willingness to accept the emotional risk that comes from being open with someone) to another person (the trustee) who acts on behalf of the trustor (Dietsch et al. 2021). This definition has been expanded for the conservation domain to define four different types of trust (Stern and Coleman 2015). The Stern and Coleman (2015) typology illustrates the complexity of trusting relations by identifying the underlying basis for trusting or distrusting authority (e.g., protected area governance authorities). This relates to the specific outlooks and contexts of different groups of stakeholders (e.g., trust relationships can vary between different villages around a protected area or involve differences within a village or even within individual households). Building trust through different types of trust can also help secure trusting relationships even when one level or type of trust breaks down.

Trust is thus a very individual concept linked to past experiences and future expectation, personal qualities and so on, which makes it hard to quantify and measure. Communities (whether of rangers or of local people) do not usually trust as a block; rather trust is built around personal, individual relationships. Trust is also mutual: in this case it requires actions with and by communities or individuals and actions with and by ranger(s) to build trust effectively. Trust emerges when two or more parties are clear and constant in their approach to an issue, when equity, equality, and empathy, understood as the ability to understand and share the feelings of another person, are present and through the innumerable small acts of kindness and thoughtfulness which help build a relationship. The breakdown of trust can happen in a moment, or over decades, when expectations are not realised, when there is a breakdown in communication, when people/communities do not feel respected or when inequalities are so entrenched that trust is virtually impossible. Mistrust between two parties can also be caused by third parties, who may benefit from the breakdown of trust between the first two parties. Furthermore, trust may never be complete and is not unidirectional.

The WCPA good practice guidelines build on this understanding of trust to identify the many different ways that trust can be built between rangers and local communities. These good practices are broken down into eight principles outlined below.

Principle 1

Diversity, equity, and professionalisation: to help manage and sustain a diverse, committed, well-trained, and high-quality ranger force that is secure in and proud of their profession.

Principle 2

Respect, cooperation, and peacebuilding: building relationships between and within local communities and rangers characterised by mutual respect is a major contribution to developing trusting relationships.

Principle 3

Connecting, listening, and learning: mutual understanding of rangers' roles and community needs helps connect people and, through listening and learning, trust can be developed.

Principle 4

Being a good neighbour: creating a positive and supportive community environment, with rangers a functioning part of the local community, considered by the community as a member not a visitor.

Principle 5

Finding common ground: helping communities and rangers reach agreement over topics and work together towards common goals.

Principle 6

Presenting the right image: good practices rangers and their managers can employ to help soften the image of rangers to present a more friendly, trustworthy persona.

Principle 7

Sharing a love of nature: rangers make excellent facilitators for inspiring and encouraging a love of nature, both for tourists and community members.

Principle 8

Working and playing together: frequent, positive experiences of working and playing together can underpin feelings of support, reliability, friendliness, generosity, and kindness.

Rangers and Indigenous People

Participation in conservation processes is a basic human right and a necessary component of conservation success (Dietsch et al. 2021). National governments should take on the role of promoting, protecting, and fulfilling human rights, ensuring institutional frameworks and processes (e.g., legislation, judiciary, oversight, policies, management, monitoring, and reporting) adhere to international, regional, and national human rights standards and norms. Alongside, efforts should be made and supported to create greater knowledge and understanding of human rights values and norms amongst individuals and communities (Woodside et al 2021). Any focus on building trust between rangers and communities therefore needs to start with a human rights perspective for all involved—rangers, other conservation staff, Indigenous Peoples, and local communities.

Research has shown that humans tend to coordinate, collaborate, and be kind to others with whom the actor shares a common interest (e.g., teammates and group members) (Curry et al. 2018). The latest International Ranger Federation ranger survey found that more than 40% of ranger employers stated that more than half of the employed rangers are from Indigenous Peoples and/or local communities (IRF 2024). Employing rangers

from the local community helps ensure integration of local values and traditional/custodial roles within protected and conserved area management. Being local also means rangers are closer to families and friends. Research in Madagascar found that attachment to place was a major motivation in people becoming rangers, again suggesting the importance of a local connection (Rakotobe et al. 2023). This also correlated with rangers having a higher job satisfaction due to more amicable community relationships (Singh et al. 2022).

Employing local rangers can also help to avoid the feeling that jobs are being taken away from local people or that strangers are being brought in to "control" local people. The perception of "local" can vary; for some, coming from a neighbouring village is local, in other cases neighbouring villagers are seen as outsiders. Local rangers also have the additional benefit of having more chances to build relationships with the rest of the community. For example, the U.S. Forest Service recruits local high schoolers (15–18 years old) to join a Youth Conservation Corps where they learn about conservation whilst working alongside experts on various projects. These teams help connect families with the work of the rangers whilst also educating young people on how the community uses and views the protected area (USDA Forest Service, n.d.).

Figure 3 - Hannah Dabney discusses how she joins sports clubs to meet local people when she is moved to a new town for work in the U.S. Forest Service (photo: Hannah L. Timmins).

However, it is also important to note the potential issues around employing local rangers and to manage such issues. In many cultures, respect is paid to community leaders no matter the cost; for example, a local ranger might find themselves in a compromising position if their community leader or elder does not wish to follow equitably agreed rules. It is essential to support local rangers with training, resources and potentially anonymity if such a situation occurs. It is currently a common practice for rangers to be deployed in sectors that do not include their own villages, and/or to be rotated regularly between sectors depending on the size of the area being

conserved. Ranger employment and deployment is of course very context specific, but mixing ranger teams of locals and non-locals to maintain some independence from local politics is worth considering. Also having robust mechanisms in place such as whistleblowing for rangers and grievance redress mechanisms for local communities should ensure that potentially negative issues are minimised, while maximising benefits in terms of developing trusting local relationships by having local people managing local areas.

A study into employing Indigenous Peoples within the ranger workforce found benefits include the ability to both communicate, empathise, and understand local Indigenous communities, and to assist and educate non-Indigenous colleagues (Moreto et al. 2023). This results in wider organisational dissemination of insight and awareness of Indigenous customs, traditions and knowledge. The issues highlighted above were also noted, in particular the difficulty of enforcing laws and regulations in the communities that Indigenous rangers are from, as well as difficulties in recruitment and promotion (Moreto et al. 2023).

Rangers Good Practices at WILD

The editors of the WCPA good practice guidelines ran a session at the WILD Congress—*Sharing and learning: Indigenous perspectives on ranger and community relationships*—to introduce the guidelines and gather additional good practices and videos. The session generated lively discussion particularly around the importance of local and Indigenous Rangers. For example, Christopher Eagle Bear, a councillor from the Rosebud Sioux in South Dakota, discussed the importance of employing local rangers within his reservation to protect their land and sovereignty as Native Americans. There is only sufficient funding for 6–7 rangers across the large reservation which covers over 5,000 km^2 and is home to 30,000 people. The rangers are well respected within the community, as they share the same goals as their fellow local community members to keep their identity safe and protect their people, water resources, sacred grounds, sources of traditional medicine, and the animals, the latter particularly from local non-Indigenous hunters looking for antlers as trophies. Elk and deer populations are increasing in the reservation due to the protection provided by the community and when animals are legally killed the whole carcass is used. Christopher stressed that the animals are their partners: "without them there would be no us". However, the pressure of money from hunters who are willing to pay to hunt is strong. The rangers work hard to keep the local community informed and engaged through strong communication. You can hear more from Christopher here: https://www.youtube.com/watch?v=ReojwYHOea8&list=PLqajCqmAHDBf7Vmw4nntiCM5_LXhsOx-zh&index=19

Conclusions

The need for rangers is growing rapidly. There are currently about 286,000 state rangers working in terrestrial protected areas worldwide. This is far short of what is considered necessary. It is estimated that 1.5 million rangers (from a wide range of conservation governance types) will be needed to effectively conserve 30 percent of the planet by 2030, as outlined in Target 3 of the Convention on Biological Diversity's Global Biodiversity Framework (Appleton et al. 2022). A sudden influx of rangers is necessary but also brings dangers, of poor selection processes, hurried or inadequate training, and new employees who do not understand the complexities of local conditions. The ambitious targets for conservation need to be supported by the communities in and around protected areas and rangers often carry the biggest responsibility for building and maintaining good relationships. The WCPA Good Practice Guidelines on *Building Trust between Rangers and Communities* aim to contribute to this process.

References

Appleton, M.R.; Courtiol, A.; Emerton, L.; [et al.]. 2022. Protected area personnel and ranger numbers are insufficient to deliver global expectations. Nature Sustainability. 5(12): 1100–1110. doi:10.1038/s41893-022-00970-0.

Curry, O.S.; Rowland, L.A.; Van Lissa, C.J.; [et al.]. 2018. Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. Journal of Experimental Social Psychology, 76. doi:10.1016/j.jesp.2018.02.014.

Dietsch, A.M.; Wald, D.M.; Stern, M.J.; [et al.]. 2021. An understanding of trust, identity, and power can enhance equitable and resilient conservation partnerships and processes. Conservation Science and Practice. doi:10.1111/csp2.421.

IRF. International Ranger Federation. 2024. State of the Ranger Vol. 1. California, USA.

Moreto, W.; Elligson, R.; Singh, R.; [et al.]. 2023. Blurred lines—Indigenous state rangers: an exploratory assessment. Universal Ranger Support Alliance.

Rakotobe, D.J.; Dabelko, G.D.; Stevens, N.J. 2023. Strengthening a resilient protected area workforce to advance the 30x30 goal: the case of Madagascar. Parks. 29: 94–104.

Singh, R.; Galliers, C.; Appleton, M.; [et al.]. 2021. The vital role of rangers in conservation. Parks Stewardship Forum. 37(1): 128–136. doi:10.5070/P537151745.

Springer, J.; Campese, J.; Nakangu, B. 2021. The Natural Resource Governance Framework—improving governance for equitable and effective conservation. Gland, Switzerland: IUCN.

Stern, M.J.; Coleman, K.J. 2015. The multidimensionality of trust: Applications in collaborative natural resource management. Society & Natural Resources. 28(2): 117–132. doi:10.1080/08941920.2014.945062.

Stolton, S.; Timmins, H.L.; Dudley, N. [et al.]. 2023. Essential planetary health workers: positioning rangers within global policy. Conservation Letters. 16(4): e12955. doi:10.1111/conl.12955.

Stolton, S.; Timmins, H.L.; Dudley, N. [et al.]. 2024. Building trust between rangers and communities. IUCN WCPA Good Practice Guidelines Series No. 35. Gland, Switzerland: IUCN.

International Ranger Federation and the Universal Ranger Support Alliance 2023. Global Ranger Competences: a concise summary of skills, knowledge and personal qualities needed by a competent, professional ranger.

USDA Forest Service. [N.d.]. Youth Conservation Corps. www.fs.usda.gov/working-with-us/careers/youth-conservation-corps.

Woodside, D.P.; Vasseleu, J.; Pyke, T.W.; [et al.]. 2021. Building healthy relationships between rangers and communities in and around protected areas. Parks Stewardship Forum. 37(1): 153–173.

12 Principles for Engaging Local Communities: Experience from Mali

BY NOMBA GANAME and SUSAN CANNEY

Introduction

This paper describes 12 guiding principles for engaging local communities in the Sahel of Mali, which are based on the experience of the WILD Foundation and the International Conservation Fund of Canada's (ICFC) Mali Elephant Programme (MEP). Success of the MEP is demonstrated by the adoption of the 12 principles (and a broader participatory approach) across the elephant range, where local communities mobilised to protect wildlife and the environment together. The participatory approach provided the basis for the creation of the 42,000 km^2 Gourma Biosphere Reserve, and the development of a multi-scale, synergistic environmental governance structure over 60,000 km^2, where institutions at the commune, municipal, and regional level were created to support, monitor, and encourage local action (and are themselves cross-monitored), thereby embedding these practices in the structures and processes of government.

All conservation actions need to be contextually adapted, and so the paper begins with a description of the social context that "sets the stage" for the description of community engagement. Although the specific details relate to the Gourma region of Mali—the area lying within the bend of the Niger river (see fig. 1)—this approach is particularly relevant where communities have some kind of tenure over their land, while the principles apply more generally to the process of local community engagement.

Part One—the Historical Context

Ethnic Groups and Their Livelihoods

There are five major ethnic groups that have long lived together in the Gourma, namely the Tamasheqs, Fulani/Peul, Songhaï, Dogon, and the minority Arab/Moors. Within each of these groups there are dependent subgroups especially among the Tamasheq and Fulani.

Among these groups there are two conflicting lifestyles and livelihoods. First, there are the traditionally-agricultural Dogon and Songhaï groups, who consider all lands to be primarily used for agriculture, which results in large areas being cleared for that purpose. The traditional agricultural lifestyle can potentially conflict with a traditional migratory and pastoral lifestyle, mainly adopted by the Fulani, Tamasheq, and Moor groups, which focuses on the distribution of water and pasture over space and time, rather than attachment to fixed sites. The two different lifestyles and livelihoods are in constant tension over the control of land and its associated uses.

Furthermore, many ethnic groups have splintered into smaller subgroups, leading to additional dissension and challenges of living together. Numerous confrontations have occurred, with various alliances forming and breaking up over decades and, as a result, social cohesion has been severely undermined. Without social cohesion, there are many difficulties associated with mobilising local communities to protect wildlife and the environment.

Nomba Ganame *is the Head of Field Operations for the Mali Elephant Programme.* ***Susan Canney*** *is the Director of the Mali Elephant Programme.*

The Movements and Interactions of Ethnic Groups over Time

Although there is evidence that human settlements existed much earlier, the period of primary knowledge about settlement of the Gourma region is the 19th century. At that time, the Gourma region was under the domination of the Fulani in the west and centre and the Tamasheq in the north and east. The oldest Fulani political settlements in the Gourma are those of Dalla and Kanioumé, Boni, and Diona. According to local Fulani tradition, these chiefdoms were organised in the early 19th century by Mulay Hyamado Dicko of Macina.

The desire to extend the ruling Dina's area of influence, internal opposition, alliances or confrontations with other Fulani chieftaincies, and clashes with the Tamasheq tribes led to numerous changes in these chieftaincies throughout the 19th century. The Tamasheq, meanwhile, used the Gourma for pastoral purposes, exercising their power without establishing any real fixed sites. Today, the tribes are divided into a multitude of sub-groups or "fractions".

According to oral tradition, there were several Songhai settlements in the Gourma in the 19th century, formed by Songhai fleeing the decline of their empire at the end of the 17th century. They settled at the foot of the Gandamia and Hombori hills, sites which are ideal for farming.

The Dogon live mainly on the Bandiagara plateaux, to the west of the Gourma. Raids by the Fulani and Tamacheq confined them to the foot of the cliffs. However, increase in population and the need to extend the area under cultivation led the Dogon to gradually extend into the plains; although there were, and still are, strong traditions of wildlife and environmental protection governed by local rules and sanctions.

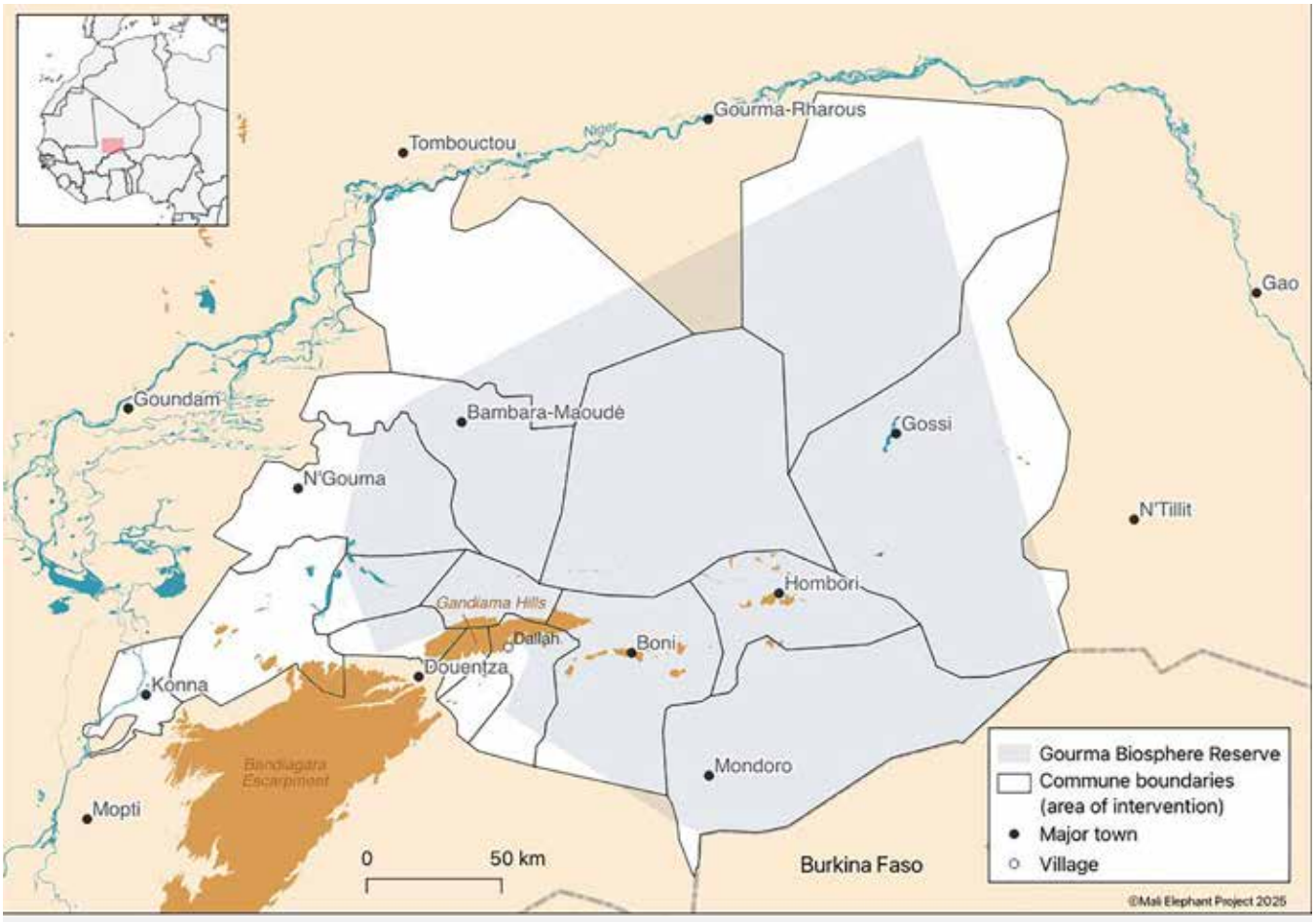


Figure 1 - The Gourma region of Mali

Recent Times: Challenging Conditions and a Population in Flux

The major droughts of the 1970s and 1980s and the recurrent Touareg rebellions of the 1990s led to increasing numbers of Tamasheq groups settling in the Gourma; this has been facilitated by emergency aid and refugee assistance programmes, which provided support. These new settlements have led to clashes, often with older populations, leading to difficulties in the collective management of natural resources, wildlife, and habitats.

Little by little, the nomadic population's relationship with space and land is changing, as pastoralists are increasingly developing the land, and agricultural groups are investing more in herding. Some areas of the Gourma are sparsely populated with no state representation; and some herders and farmers settle in the deep Gourma to escape "red tape" such as tax payments and checks by the water and forestry officers or customs officers. Other groups, often nomads, settle around waterholes hoping to find better conditions such as water and pasture and aid often through non-governmental organisation programmes or projects. If they are unable to obtain the external aid they are hoping for, they leave to explore other areas. People engaged in this nomadic lifestyle are often ignored or not formally recognised, and they are referred to as the "floating population".

When a group succeeds in obtaining outside help to improve its living conditions, its location can become a major magnet for other floating groups. In fact, as soon as a well or water point is created, new possibilities for developing the environment are opened up. The influx of new arrivals can create tensions with those who have obtained outside help, as well as those who traditionally have control over these areas. As well as resident populations, there are migratory herders from distant origins on the outskirts of the Gourma who exploit the Gourma's resources on a seasonal basis. Depending on climatic conditions in the region, the Gourma may also attract herders and their flocks from further afield, from Haoussa, Burkina Faso, or Niger. These herders may abandon their seasonal use and settle if the living conditions in their environment of origin are poor due to climatic and/or political factors.

While the conditions of those within the Gourma have always fluctuated, more recent changes such as increased population, increased exploitation by commercial interests, desertification, and a loss of ecological richness and climate change, have led to more than half of the population living below the poverty line.

The Mali Elephant Programme (MEP)

In 2003, WILD Foundation worked with Save the Elephants to undertake scientific studies over three years to understand the migration route of and the threats posed to an iconic elephant population (Canney 2007; Wall et al. 2013). The chief threats were increasing destruction of key elephant habitat, obstruction of the elephant migration route, and environmental degradation that increased competition between humans and elephants for scarce resources. The Gourma's natural resources are over-exploited, leading to environmental degradation. This is a result of the needs of growing local human populations, resulting in habitat clearance and reduction in vegetation cover and water resources, coupled with increased pressure from commercial interests (often based in distant urban centres) such as demands for firewood, charcoal and cattle, and poaching and mining interests. Given the low levels of political will, it was clear that local people were key to the survival of these elephants in this vast, open, populated landscape. On the basis of these findings WILD Foundation, through the U.S. Fish and Wildlife Service, supported social engagement over another three years to better understand the socio-economic context; a partnership with International Conservation Fund of Canada (ICFC) in 2010 enabled the development of a community-led approach to dealing with the challenges described in the previous section.

The complexity of the social-ecological context and the size of the elephant landscape (32,000 km^2) highlighted the potential value of a whole-system, participatory approach (see Canney (2021) for full details of the participatory approach). Here we highlight 12 principles, which are lessons learned from this participatory approach. The work began with the communities surrounding an important late-dry-season surface water hole, and grew from there to cover 60,000 km^2. It was enabled by Mali's decentralisation legislation, which gives local communities the legal right to manage their natural resources, with the rules of resource use articulated in local- and commune-level "conventions" or agreements.

This required bringing together all the ethnic groups in the community to discuss their daily problems in relation to the environment and elephants until a unified perception was reached. The next step was to discuss what needed to be done. This involved creating structures or institutions that prevent over-exploitation and degradation of natural resources, while protecting key elephant habitat from destruction, being careful to identify the qualities required for success. These structures were modelled on traditional management structures, which consist of a management committee of elders and a team of youth who conduct patrols to detect infringements and complete habitat protection and restoration work such as building firebreaks. The difference was that they involved all ethnic groups, as it was recognised that an inclusive, transparent and equitable process was required to ensure that decisions made could endure into the future.

Although the aim had been to make space for elephants, these systems were also found to deliver multiple benefits for local communities such as improved livelihoods, occupations for youth, opportunities for women, improved social cohesion, and a mechanism for promoting human–elephant coexistence.

Part Two—12 Key Principles for Mobilising Local Communities to Protect Wildlife and the Environment

Principle 1: Dialogue to Promote Awareness for the Management of Spaces and Resources

Before action on the ground can begin, dialogue is required to raise community awareness to build a shared understanding of:

- the differing perceptions of existing space, natural resources, and wildlife, as well as forms of attachment to the land and its resources;
- the real causes of environmental degradation, the link to their daily challenges, and the need for regulated natural resource use;
- the potential benefits of strengthening social cohesion to take concrete collective and individual protective action.

Once communities perceive that collective action is in their immediate interest, it is possible to then proceed to determining what actions are required, where, and the management and governance structures needed to achieve enduring visible results. For example, the challenge of finding daily forage and water for their livestock at the end of the dry season is alleviated by protecting an area of reserve pasture from wildfire. This requires collective action to construct firebreaks, and all benefit.

This step of developing a shared perception of the issues and their relation to daily life is vital—it makes the rest possible.

Principle 2: Analyse Past Interventions

Bringing together and mobilising local communities to protect wildlife and the environment requires knowing what has already been done in the target area. Previous initiatives may provide information and lessons (both positive and negative) that can support new projects in a given area. The Mali Elephant Programme has sought to understand:

- the impact of the actions taken by previous initiatives (as well as our own MEP) aimed at preventing over-exploitation and degradation of natural resources;
- whether the actions have had an enduring legacy or have effectively disappeared once the initiative closed; investigate the causes to better understand local dynamics before implementing new actions on the same themes.

Principle 3: Recruit Local Facilitators for the Consultation Process

Bringing together and mobilising local communities requires a great deal of skill, thorough knowledge of the local environment, and a command of local languages. The MEP has invested in community facilitators who have a particular interest in, and understanding of, the problems of rural populations, have good communication skills, are good listeners, and are able to adapt to the logic of the people they are working with. They must be able to empathise and interact as equals with the local populations and ethnic groups and, finally, they must be able to adapt their approach to different situations as they evolve, while remaining impartial. This is necessary to ensure that the less visible aspects, such as power relations or cultural norms, are accounted for.

Principle 4: A Timely Initiation of a Participatory Approach that Empowers Communities in All Aspects of Conception and Planning

Often there is a need for in-depth studies to guide action, for example in identifying areas of conservation interest and in understanding the underlying socio-economic situation. This knowledge is important to inform activities but the initiation of activities should not be delayed while awaiting the results. Instead these studies should be used as a tool for promoting consultation with and between beneficiaries. Sharing the findings of the in-depth studies with the local population can initiate dialogue and encourage exchanges between social groups, thus positively supporting Principle 1 (i.e., general awareness).

Nimbleness and a commitment to concrete action early on promotes local trust, something that is difficult for large institutional projects, which can take many years from studies to implementation. For local communities, action must follow initial engagement to gain their trust and trust is key for success.

Principle 5: Identify and Locate the "Right" Project Contacts

It is important for any project working to protect wildlife and the environment to understand social groups and to identify the origin of the social dynamics involved (for example between elected representatives, local, customary and religious authorities, the State, and its services). It is therefore vital to have the support of local people who can enlighten the project team about the relationships between social groups and their impact on natural resource use, but who are also regarded as legitimate and representative.

Some communities, for example, will have more social influence than others because they have previously benefited from external aid and will know how to forge relationships with projects that interest them and steer the project towards their own interests. These communities should not be seen as the project's privileged interlocutors, but included as equal to others.

Principle 6: Take the Time Required, and Leave the Time for Consultation

Local decisions concerning land tenure are rarely made by a single decision-maker but by a "decision-making network". The village chief needs to consult and possibly negotiate with the people who live on "his" land or who use it, with his advisers, with his clan, with the customary authorities on which he depends to a greater or lesser extent. This takes time but is essential to give legitimacy to these decisions. To accommodate this, the MEP uses a flexible timetable, working with the natural rhythm of these communities, adapting it as local consultations within and between ethnic groups evolve. Action is required within a reasonable timeframe without forcing adhesion to a strict, pre-determined timetable.

Principle 7: Develop an Approach that Promotes the Coherence of Interventions in the Project Area

This is important to avoid fuelling or multiplying local conflicts of interest. Investment and development projects constitute centres of attraction for interests and people, and when implemented without an understanding of their wider impact, negative and irreversible social and land impacts may occur. These can result in conflict between and within ethnic groups over access, which can then create negative environmental impact. Prime examples are the creation of new water points without a process of inclusive community engagement leading to social disputes, unregulated use, and environmental degradation.

The MEP is working on a protocol of intervention principles relating both to the consultation and participation process as well as particular technical interventions. An example of one of these would be that all projects should avoid digging wells and creating water points more than a few kilometres from human sites because of the environmental and social impacts.

Principle 8: Focus on Actions that Generate Short-Term Benefit to Encourage Actions that Generate Long-Term Impact

The benefits of natural resource management are visible to local people in the short-medium term, while the benefits of biodiversity conservation may only become apparent in the long term. It is therefore essential for the project to strike a balance between:

- actions with direct benefits in the short-medium term to mobilise the population and to encourage them to take action. For example, setting aside pasture reserves and protecting them with firebreaks demonstrates the imme diate benefit of collective environmental management because it means the community has guaranteed pasture nearby at the end of the dry season, when the price of forage is high. It also means that the local community can sell forage and charge others for access to grazing;

- actions to deliver long-term objectives with indirect benefits, such as ecosystem protection and regeneration. To attain these, the MEP supports communes (or districts) and inter-communal bodies in drawing up local agreements and action plans setting out all the measures to mobilise local communities to protect and restore wildlife and the environment. Their role is to have an overall view of the wildlife and environmental protection initiatives being carried out in their area, and highlight those that deserve support because they are beneficial to the community, or at least to as many people as possible.

Principle 9: Landscape Planning—Zoning and Varying Different Actions Across the Landscape

Given the long-term objective of the Programme (to bring together and mobilise local communities to protect wildlife and the environment) and the short- and medium-term motivations of local people, zoning can be used to enable a balanced approach across the landscape. There are three general categories, all of which are drawn up and enforced by the local communities themselves:

- areas under strict protection from all human presence and activity;
- areas with highly restrictive rules on natural resource exploitation, for example where herders may graze their herds but not stay overnight;
- areas under natural resource management, where natural resource use is regulated to prevent degradation and restore productivity, diversity, and resilience.

Principle 10: Let Communities Decide Where to Locate Actions according to Pre-established Criteria

Once the criteria for natural resource management and wildlife protection actions are discussed and agreed, allow local people to identify where, and allow them to organise themselves to carry them out.

In the case of the area covered by the MEP, for example, certain areas are not used intensively by local people and are of little or no strategic interest due to their isolation and/or lack of water, making them "low-hanging fruit" when it comes to identifying areas for strict protection for wildlife. The Programme works with local communities to raise awareness of the long-term interest and indirect benefits of such protection and help them identify these areas.

Principle 11: Achieve Objectives Through using Existing Knowledge and Practices

The introduction of novel actions, structures, and technology can lead to confusion among local people; so to achieve the objectives of protecting wildlife and the environment through local communities, it is essential to support local people, through starting with what they already know and do, and gradually guide them towards actions that contribute to the overall conservation of natural resources and biodiversity.

In rural areas such as the Gourma region, a number of local associations exist to manage natural resources, and some of them are administering existing natural resource management initiatives, but it is necessary to understand the initiatives and rules to build support for development that includes more actions specifically targeted at ecosystem protection and regeneration. For example, initial activities for pastoralist communities might include livestock fattening where just a few animals are reared and sold to generate a cash income. This is in contrast to

keeping large flocks of free-range animals with high environmental impact, and introduces the notion of benefits from collective environmental management.

Taking this more gradual approach encourages communities to emulate each other in a good-natured rivalry, while fostering adoption by other communities who see the benefit and adopt the practices themselves..

Principle 12: Mobilise Women and Youth

In rural areas, as elsewhere, women and young people spearhead action, although often they are marginalised. In the protection of wildlife and the environment by local communities, it is essential to involve them in decision-making and activities.

In the case of the MEP, young people play an important role in collecting data on the distribution of elephants and any elephant deaths or poaching incidents. They conduct manual labour for environmental protection and restoration such as building firebreaks, planting trees, and building fences or barriers to keep out livestock. They patrol to detect infringements of community environmental regulations and raise awareness of the importance of wise environmental management and wildlife protection, often acting as role models for younger children. The women are skilled at implementing income-generating activities that benefit from the increased resources available through natural resource management and protection of wildlife and its habitat, making enough cash to feed and clothe their children, send them to school and buy household essentials such as tea and sugar.

Conclusion

Bringing together and mobilising local communities to protect wildlife and the environment is a very long process that requires patience, time and, above all, competent human and financial resources. The MEP has found that using the above principles engenders behaviour change through embedding conservation in daily lives and practices; it aims to accompany communities until they experience the benefits for themselves and environmental and wildlife protection becomes a habitual part of daily practice.

References

Canney, S.M.; Lindsey, K.; Hema, E.; [et al.]. 2007. The Mali Elephant Initiative: Synthesis of knowledge, research and recommendations about the population, its range and the threats to the elephants of the Gourma. Unpublished report. Boulder, CO: WILD Foundation, Save the Elephants, and the Environment and Development Group.

Canney, S.M. 2021. Making space for nature: Elephant conservation in Mali as a case study in sustainability. Environment: Science and Policy for Sustainable Development. 63(2): 4–15. doi:10.1080/00139157.2021.1871292

Wall J.; Wittemyer G.; Klinkenberg B.; [et al.]. 2013. Characterizing properties and drivers of long distance movements by elephants (*Loxodonta africana*) in the Gourma, Mali. Biological Conservation. 157: 60–68.

The Tohono O'Odham Conservation Collaborative: Merging Education and Environmental Priorities to Build Conservation Career Paths with Indigenous Communities

BY ADRIAN QUIJADA, RICHARD SAUNDERS, LEE GAULT, KIM FRANKLIN, and GREGORY HANSEN

Abstract

Given the significant ecological challenges humanity faces, it's essential we rapidly scale up the coalitions and networks of diverse groups needed to address the pressing environmental issues before us. Traditional Cultural and Ecological Knowledge, as passed down through the ages offer practical, time-tested practices that can be of great benefit to contemporary land stewards across the globe. Understanding cultural differences and working together to identify and put into practice ways to avoid misunderstandings can help us potentially heal and work together to steward our wild landscapes.

Introduction

Historically, the O'odham inhabited an enormous area of land in the southwest of North America, extending south to Sonora, Mexico, north to Central Arizona (just north of Phoenix, Arizona), west to the Gulf of California, and east to the San Pedro River. This land base was known as the "Papagueria", from the old name "Pápago" given to Spanish colonizers by rival tribes, and it had been home to the O'odham for thousands of years (Erickson 1994; Tohono O'odham Nation 2024).

The Tohono O'odham Nation (TON) is a federally recognized Tribe located in Southwestern Arizona along the United States–Mexico border. The TON with its 2.8 million acres, approximately the size of Connecticut, is the second largest reservation in the state and sits at an average elevation of 2,674 feet. Today's Tohono O'odham who reside on reservation land live on one of four separate pieces of land that make up the Tohono O'odham Nation. The landscape of the Nation is topographically complex, with mountain ranges such as the Baboquivari Mountains, desert scrub, desert grasslands, and an entangled watershed system sustained by monsoons and winter rains. Soon after the Tohono O'odham were pressed into reservation life in 1917, the People began to run cattle. Grazing livestock in Southern Arizona is not an easy task but the O'odham excelled at ranching even in the most sterile environmental and extreme weather conditions. The same horse and livestock culture

Adrian Quijada *is the Director of the Land Grant Office of Sustainability, Tohono O'odham Community College at Sells, Arizona, USA.* ***Richard Saunders*** *is the Director of the Tohono O'odham Natural Resources Department at Sells, Arizona, USA.****Lee Gault*** *is a Natural Resource Management Consultant at Tohono O'odham Community College, Flagstaff, Arizona, USA.****Kim Franklin*** *is the Associate Director for Conservation for the Arizona Sonora Desert Museum at Tucson, Arizona, USA.****Gregory Hansen*** *is the Statewide Tribal Relations Coordinator for Arizona Conservation Corps and serves as Natural Resource Management Advisor for the Tohono O'odham Community College at Sells, Arizona, USA.*

that began over 100 years ago for the Nation, is still very much alive today, and is an essential economic as well as social element of contemporary Tohono O'odham life. With the rise of the livestock culture came the need for more intensely managed TON rangelands.

The People had traditionally managed their homelands successfully for thousands of years, but the stewardship challenges changed and intensified as now the People are tasked with managing livestock on over 2 million acres of extremely dry and heavily used range.

Figure 1 - Livestock is essential to Tohono O'odham culture.

Figure 2 - Sacred peak at the center of Tohono O'odham Nation (Tribe respectively asks we do not share peak name).

Figure 3 - Tohono O'odham Basket Dance.

Today, the TON supports a robust environmental management program recognized for its Indigenous-style range and natural resources management accomplishments. This longstanding quality work in environmental stewardship sets the stage for expanding the Nation's environmental management capacity and thus establishes a framework for the development of the conservation collaborative featured in this article. However, questions remain: why is "Indigenous-oriented" conservation programming needed? How can this type of specialized programming be effectually implemented with our wilderness management agencies and non-governmental organizations (NGOs) as critical partners? Most importantly, how can this approach offer career opportunities for Indigenous community members seeking employment in natural resources management and in service to their Nations?

Need for Indigenous Conservation Collaboration

Employment opportunities for Indigenous people in the U.S. are often strictly limited to working in towns located adjacent to Native communities or attaining jobs with tribal governments, such as working in tribal administration or for one of the many Indian Health Service departments. Larger tribes can typically offer jobs in environmental and natural resources management. However, many of the smaller tribal groups have fewer natural resources and less capacity to manage resources, resulting in fewer employment opportunities for tribal members.

Indigenous youth and young adults may also face challenges when thinking about entering the conservation workforce or leaving home and going off to college, as this literally means leaving "all" that has meaning behind! It's well known that Indigenous groups around the world have always had and still hold a sincere and heartfelt connection with family and their homelands. So asking a young person who's never been too far away from their community to leave their family, leave their friends, and homeland to go off for long extended periods of time to a completely foreign and environmentally sterile locale to live and study under the strictest timelines in highly competitive surroundings? Therein lies just a few of the challenges and barriers that Native youth sometimes face when entering the conservation workplace, and it is a primary objective for the Collaborative to blast through these types of barriers by providing solid science-based practical environmental learning specifically designed to engage and inspire Indigenous students into the environmental fields.

Wildland stewardship and public land conservation serve as common ground and a shared language for tribal communities and land management agencies. The effects of environmental change are equally felt across tribal and non-tribal communities, a common understanding that fosters unity when tribes and agencies come together. Shared environmental challenges bring tribal institutions, NGOs, and government agencies closer, rather than driving them apart.

In Arizona, USA, for example, the threat of wildfires triggered by invasive species like buffelgrass disrupts the environmental balance and directly and indirectly affects most peoples, whether they reside on tribal lands or not. Tribal and non-tribal environmental departments all benefit from sharing issues, needs, and potential solutions through respectful and trusting partnerships such as the Tohono O'odham Conservation Collaborative.

Tohono O'odham Conservation Collaborative

Collaboration between the TON Department of Natural Resources, Arizona Conservation Corps, Arizona-Sonora Desert Museum and the Tohono O'odham Community College has fostered a synergetic planning process to address environmental challenges affecting the TON. This process is based on science, technology, traditional and contemporary environmental management experience, and community needs. One of the most critical outcomes of this collaboration is the development of programs to train environmental professionals who will be dedicated to assisting and resolving challenges on tribal lands.

The TON Conservation Collaborative model begins with Arizona Conservation Corps' (AZCC's) Tribal Relations Coordinator (TRC) and AZCC staff establishing trusting relations with key tribal leaders and department heads. The TRC then works closely with tribal leaders to build, manage, and maintain a functioning Tribal Conservation Working Group (WG). Tribal conservation working groups most often engage with as many tribal departments as possible, but more realistically coordinate with the departments that best fit the WG mission and that have the capacity to actively participate.

The TON WG is made up of one or two Tribal Council representatives, multiple Youth Council representatives and adult advisors, and department directors and deputy directors from Natural Resources, Career Services, Education, One-Stop Employment, and Cultural departments. Extra community support is provided by the staff at Tohono O'odham Community College. Conservation WG alumni who now hold leadership positions with districts out on the Nation, or who moved to other TON departments also stay involved with the WG by lending their expanded networks and outreach capacity to support the awesome work of building-out the TON conservation program.

Once trusting relationships are in place and a functioning conservation WG has been established with as many tribal departments as deemed appropriate, it is possible to begin talking about partnership goals, fieldwork projects, a partnership work plan, and program funding. After a WG group has been effectively functioning as a conservation governing body for an extended period of time, and both the tribe and all collaboration partners feel comfortable moving the partnership ahead, it is then possible to consider escalating the relationship to the level of a formal conservation collaboration, sanctioned and supported by a formal agreement.

Figure 4 - The Tohono O'odham Nation Conservation Working Group celebrating its sixth anniversary.

Conservation Collaborative Partners

Tohono O'odham Nation Department of Natural Resources

The mission of the TON Department of Natural Resources (NRD) is to manage and protect the Nation's cultural and natural resources through the inventory, conservation, and development of these resources. The NRD also aims "to support, communicate, collaborate with all TON programs to continue to provide effective services to the Nation's membership and public". It administrates nearly 18 different programs, including Natural Resources Administration, Range Conservation, Soil and Water Conservation, Solid Waste Management, and Wildlife and Vegetation, which are all relevant and belong to the greater Conservation Collaborative. The Department provides advice on environmental priorities and human resource needs. It also constitutes the most appropriate vehicle for community outreach and communication with TON districts and leadership. Therefore, any and all TON Conservation Collaborative work and/or activities are always vetted through and fully sanctioned by NRD.

Tohono O'odham Community College

The Tohono O'odham Community College (TOCC) is a 1994 Land-Grant Tribal College located within the TON. The Tohono O'odham Legislative Council chartered the College in 1998 to educate the Nation as a means to uphold Himdag—the Tohono O'odham way of life. TOCC has a student body of approximately 1,200 students of which 95% are Native Americans, and nearly 350 are from the TON.

The vision of TOCC is to "become the Tohono O'odham Nation's center for higher education and to enhance participation in the local, state, national, and global communities". The mission of TOCC is to "enhance our unique Tohono O'odham Himdag by strengthening individuals, families, and communities through holistic, quality higher education services" (TOCC Annual Report 2021). The TOCC currently has two campus sites: S-cuk Du'ag Maṣcamakuḍ, and Wiṣag Koṣ Maṣcamakuḍ, both located along Arizona Highway 86, which transects the TON. The Wiṣag Koṣ Maṣcamakuḍ is the residence of the TOCC Sustainability Division, and the center for occupational programs, the General Education Diploma (GED) program, the Student Learning Farm (SLF), and the Land Grant Office for Sustainability (LGOS).

Supported by a USDA-NIFA grant, LGOS is developing micro-certificate programs (MCPs) focusing on Tohono O'odham Natural Resources, Tohono O'odham Traditional Agriculture and Food Systems, Land Restoration/Invasives Management, and Tohono O'odham Ferrier and Horse Care. These certificates are specifically designed on the basis of community member survey responses and public consultations on the development of training that responds directly to community needs. The TOCC has successfully piloted its first MCP in Horseshoeing, which has received full accreditation. It is currently implementing the Natural Resources Micro-Certificate Program (NRMCP). The TOCC MCPs are free of charge for all Indigenous students, regardless of tribal group, band, or sovereign nation. The TOCC has shared its MCP experiences with other tribes and is open to more tribe-to-tribe educational exchanges and cultural collaborations, pending requesting tribe's needs and TOCC staff capacity to engage.

Arizona Conservation Corps

The Tohono O'odham Conservation Collaborative was initiated when the tribe began partnering with the AZCC in 2018 on conservation issues. TON–AZCC crews have worked on traditional O'odham lands in partnership with the National Park Service (NPS) and the Forest Service, U.S. Department of Agriculture, conducting river restoration, traditional site restoration, resource inventory, fence construction, trail restoration, public education, and visitor interpretation work (Arizona Conservation Corps 2024).

The AZCC serves as the chief administrative support base for the TON Conservation Collaborative. The AZCC is a program of Conservation Legacy (Conservation Legacy 2024), a not-for-profit organization that fosters conservation service in support of communities and ecosystems. Conservation Legacy programs include over a dozen conservation corps across the United States. In 2024, Conservation Legacy engaged over 2,300 young people and veterans in paid conservation work, completing over 1,300,000 hours of service enhancing recreation facilities, protecting communities from wildfire, stewarding protected area resources and enhancing "**all**" communities.

Figure 5 - Arizona Conservation Corps Indigenous crew conducting cultural site restoration.

Figure 6 - Arizona Conservation Corps Native interns conducting resource inventory monitoring.

Arizona Conservation Corps' Indigenous Communities Program (ICP) is rooted in the culture and heritage of local tribal communities. The power and impact of AZCC's Indigenous programming is due to the community investment and support for each program by tribes, combined with a network of operational support from AZCC. The ICPs are made up of conservation crews and individual placements (internships). AZCC Indigenous Conservation Crews can be day crews who go home each night, overnight crews who spend a few nights a week camping at the project site, or backcountry crews who strike out and spend most nights camping in the field.

Figure 7 - Arizona Conservation Corps Indigenous Communities Program Crew team building during orientation.

Since its inception in 2014, and with essential guidance and support from their sister organization the Ancestral Lands Conservation Corps (ALCC) who is the originator of the Indigenous Youth Conservation Movement, AZCC's Indigenous program has successfully built lasting relationships with and/or run conservation crews and internships with San Carlos Apache, White Mountain Apache, Ft. McDowell Apache/Yavapai, Red Paint Apache, Tohono O'odham, Akimel O'odham, Gila River O'odham, Colorado River Indian Tribes, Cocopah, Quechan, and Hualapai Nations. Northern Arizona AZCC Native crews are recruited from western sections of Navajo, from Hopi, and from the Hualapai and Havasupai Communities in close coordination with AZCC's ALCC cousins to the east in Albuquerque, New Mexico (https://ancestrallands.org/).

In close partnership with the NPS, Northern AZCC Indigenous crews have conducted resource restoration, resource inventory, traditional site inventory/restoration, trail restoration, and visitor interpretation work at NPS units throughout Northern Arizona. AZCC ICP crews and interns have worked at Grand Canyon National Park for a decade and have been hired into full-time park staff positions. Strong ICP and TOCC career track programs are currently in the works with Saguaro and Casa Grande NPS units in Southern Arizona, and these long-term dedicated partners have been instrumental in developing the NPS career-track element of the NRMCP.

The Arizona-Sonora Desert Museum

The Arizona-Sonora Desert Museum (ASDM) is world-renowned for their staff's long-standing work in natural history and ecological exhibits, conservation education, and visitor interpretation. The mission of the ASDM is to inspire people to live in harmony with the natural world by fostering love, appreciation, and understanding of the Sonoran Desert (Arizona Sonora Desert Museum 2024).

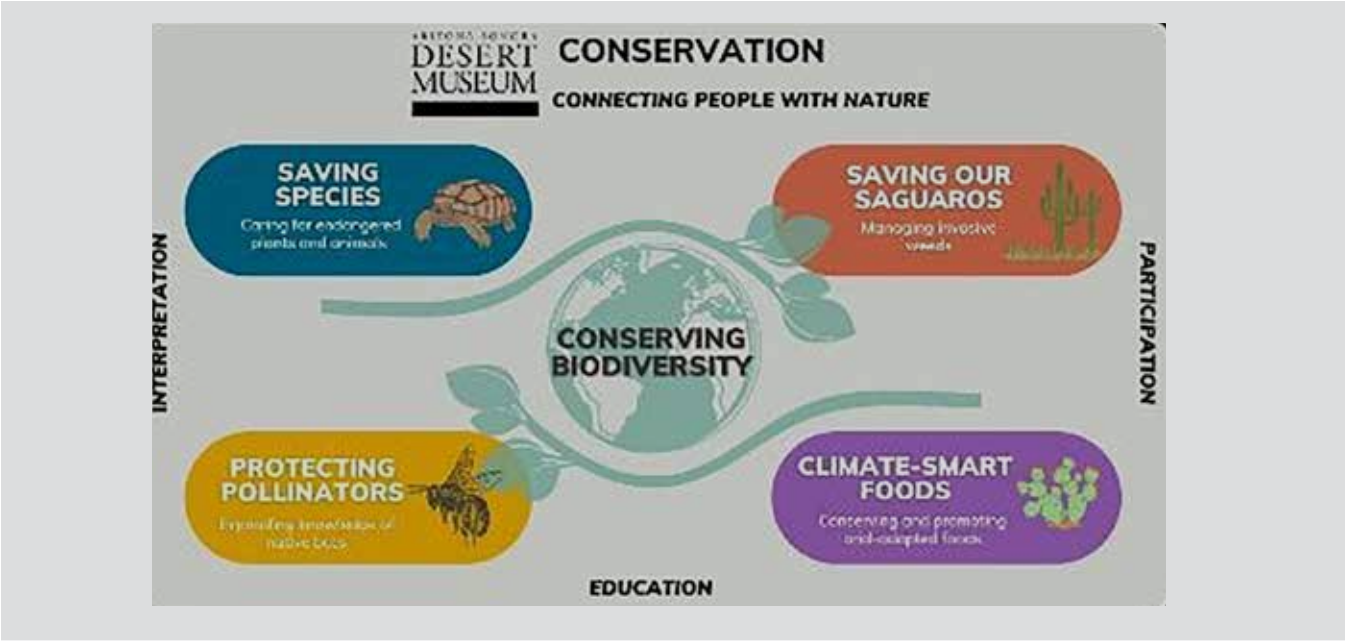


Figure 8 - Arizona-Sonora Desert Museum: "Connecting People" to environments.

The Desert Museum is ranked as one of the top 10 Museums in the U.S. and unlike most museums, about 85% of the experience is outdoors! The 98-acre Desert Museum, located in Tucson, Arizona, USA, is a fusion experience: zoo, botanical garden, art gallery, natural history museum, and aquarium. The museum offers 21 interpreted acres with two miles of walking paths through various desert habitats. These diverse habitats include 242 animal species and plants from 1,200 taxa—56,000 individual specimens—and one of the world's most comprehensive regional mineral collections. The Museum's conservation and research programs provide a strong conservation framework that brings vital research and scientific expertise and support to the Collaborative.

One key role Museum staff and scientists play in the Collaborative is to serve on curriculum design committees tasked with researching, assessing, and offering recommendations on what science will meet the academic requirements needed to adequately prepare TOCC NRMCP students for conservation positions with tribes and federal agencies.

Creating Sustainable Indigenous-Focused Conservation Career Paths

The Tohono O'odham Nation has recently identified a strong need to train and mentor young people into tribal and federal agency positions in conservation and natural resources management. To help meet this need, the Nation has fully committed to offering community members accredited natural resources management classes, training, and hands-on field experience to mentor tribal members into conservation jobs with the tribe, federal land management agencies, and local conservation corps. The TON Conservation Collaborative works to ensure that environmental professionals are attuned to the most urgent environmental needs of tribal communities by supporting the development and implementation of standardized conservation-rooted academic programming such as TOCC's Micro-Certificate Program.

The MCP is a relatively new educational concept gaining momentum with tribes nationally. MCPs are designed to provide student participants with the necessary skills and knowledge, including Traditional Cultural and Ecological Knowledge, needed to become gainfully employed or start a business without leaving home for two to four years. A few tribal colleges currently offer MCPs, one being the Tohono O'odham Community College on the 2.8-million-acre TON reserve in Arizona, USA.

The objectives of the MCP are:

a) to increase student experiential learning opportunities with the development of culturally relevant curricula design and materials that builds a dynamic and engaging learning environment to instill entrepreneurship and leadership skills in environmental fields;
b) to offer professional career pathways that provide opportunities to TON community members for direct employment, while keeping open the road towards full degrees in higher education;
c) to invest in the equipment and infrastructure necessary to build a pathway for students to stimulate entrepreneurship and business success;
d) to recruit and retain students by eliminating limiting factors to participation, such as lack of funding, time, transportation or life situations such as family home care responsibilities.

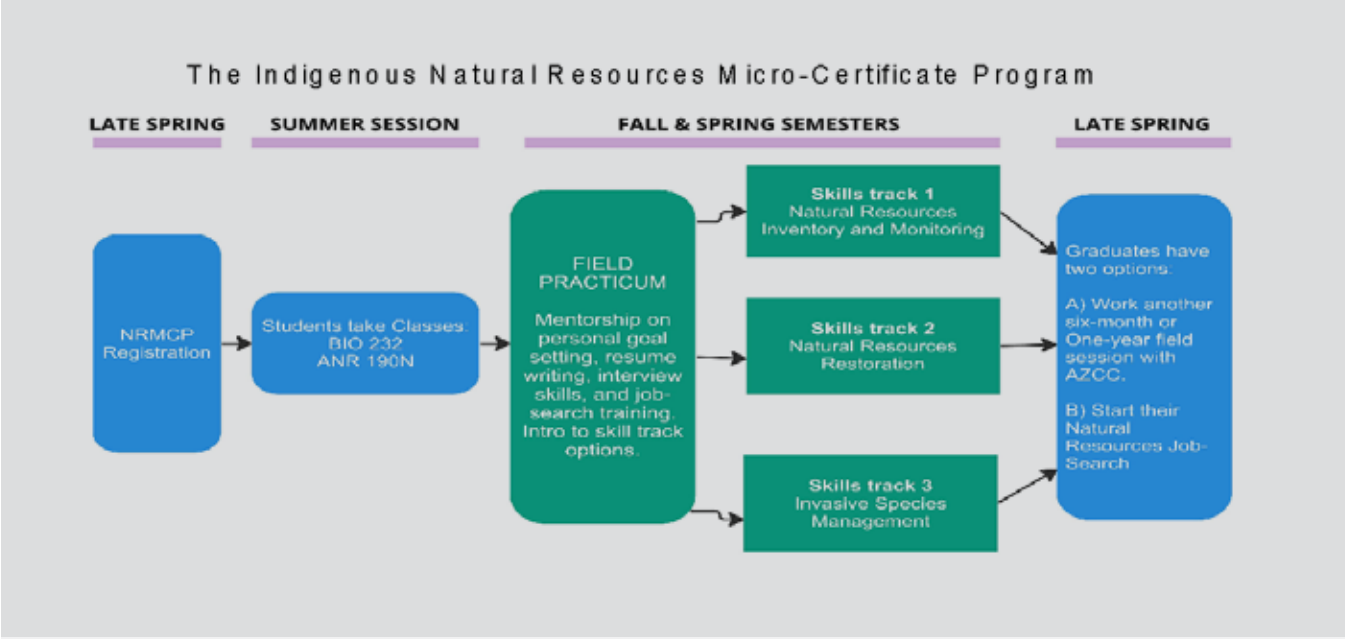


Figure 9 - The Tohono O'odham Natural Resources Micro-Certificate Program.

The TOCC's Natural Resource Micro Certificate program begins when students enroll in the late Spring-Summer Semester and take three formal courses for a total of 9 Credit Hours. These include the *Introduction to Indigenous Natural Resources* course, which is exclusively designed to give students a basic introduction to how natural resources management was conducted by the TON and other tribes traditionally, how TON and other Indigenous lands are managed today, and how the environmental policies of federal land management agencies mesh with and/or differ from tribal environmental management objectives and operations. Although Indigenous students may not fully embrace the whole "career" idea in theory, the introduction course carries a strong "work" development component that includes a comprehensive "Native-style" career development workshop. Workshop begins with students setting short- and long-term goals that serve as bridges to their agency land manager mentors or to the tribes where they aim to gain employment. The second and third formal NRMCP courses focus on the applied sciences that directly pertain to the concepts and theories presented to students in the field via the practicum, and qualify students for entry-level conservation positions with tribes, agencies, and conservation corps around the country

Traditional themes and traditional cultural and ecological knowledge are integrated into all aspects of the curricula and are specifically taught by local traditional Tohono O'odham elders. The NRMCP is fairly unique in that it carries both a traditional as well as contemporary Indigenous perspective on natural resources management and conservation, including, the theory of contemporary "W"ilderness, wildlands, and protected areas management. Then, in Fall Semester, students complete a six-month "Field Practicum" with AZCC for 3 Credits Hours. Field Practicum is designed to give students hands-on field experience in: 1) natural resource restoration, 2) resource inventory and monitoring, and 3) invasive species management. Federal agencies provide projects that meet their priority work needs, and which directly coincide with one of the three NRMCP emphasis areas.

Agency managers get to know NRMCP students via the extended six-month practicum and seek out opportunities to mentor and eventually hire NRMCP students for agency jobs at those specific field practicum sites. When completed, students graduate with the 12-Credit Natural Resources Management Micro Certificate and use contacts made via the classes with the tribe and via the Field Practicum with the agencies and conservation corps to begin their conservation job searches.

Figure 10 - Tohono O'odham Community College students earning "hands-on" field credits.

Figure 11 - Tohono O'odham Community College students earning classroom credits.

The NRMCP curriculum is closely vetted and coordinated with key tribal departments and the TON Conservation Collaborative to adequately prepare NRMCP students for jobs with TON and other tribes. The NRMCP curriculum is also assessed and evaluated by education and human resource professionals from federal agencies to ensure it meets agency standards to allow NRMCP graduates to compete for entry-level agency employment. The MCP is a relatively new concept throughout Native Country yet other tribes have already shown keen interest in using this unique "Native-style" conservation education model to guide the academic development of their own natural resource management initiatives.

Looking forward and using the "flexibility" of the MCP model, TOCC is considering adding an Associate of Applied Science degree to the NRMCP curriculum. Moreover, TOCC is in conversations with local universities to potentially develop a Bachelor of Science exchange process where TOCC NRMCP students earn their NRMCP and then transfer to a university to earn a higher degree in natural resources management.

Figure 12- Tohono O'odham Community College students enjoying themselves while gaining Traditional Cultural and Ecological Knowledge.

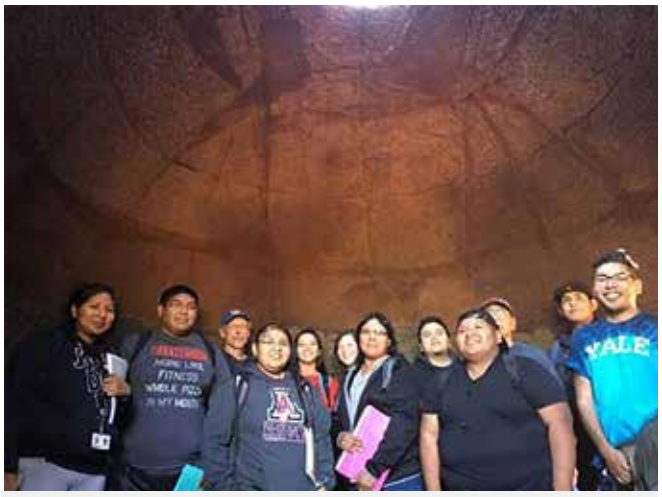


Figure 13 - Tohono O'odham Community College students enjoying themselves while gaining Traditional Cultural and Ecological Knowledge.

Offering Indigenous students educational options that fit within their personal, academic, and/or employment needs is critical to ensuring students are able to integrate into the conservation workforce as effortlessly as possible. Providing Indigenous-friendly curriculum and hands-on training to Indigenous students interested in working in conservation and natural resource stewardship is a primary mission for TOCC—and so is being a full and active partner in the Tohono O'odham Conservation Collaborative.

Figure 14 - Author Dr. Adrian Quijada with Tohono O'odham Community College graduates.

Building Stronger Tribal Relationships

It is long overdue for agency managers to begin building stronger working relationships with neighboring tribal groups. With Indigenous issues such as the appropriate management of and access to cultural and sacred sites within Wilderness, strong relationships ultimately move us closer to the common goal of managing protected areas for the use and enjoyment of all peoples (Hansen 2016).

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

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

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

Tribal Politics

Each Native group can have unique political structure and relationships. It is important for managers early in the process to avoid getting in between community divisions or becoming involved with tribal politics. In some instances, the official governing body of a community may not completely represent the philosophies, beliefs, or wishes of all community members. Managers and planners should devote time to respectfully finding out which leaders legally and traditionally speak for the entire community, and again should always avoid getting involved in cultural divisions or tribal political groups. While some community members might open up to the agency representative quicker than others, some members may never be completely comfortable with a particular collaboration or effort. Therefore, managers need to be open to receptive and approachable leaders while not purposely avoiding individuals who are resistant. They must try and work with the leaders who best represent the entire community and who are willing to develop a strong, positive partnership.

Developing Tribal Partnership Work Plan

Most tribes at some point will require some form of memorandum of understanding (MOU) and/or specialized tribal resolution to conduct any level of programming or project work inside a tribal community, or to even simply work with a tribe to recruit Indigenous crews or interns. Before any formal work can be done in partnership with most Native communities throughout the U.S. and Canada, trusting relationships need to be in place in order to have a strong enough foundation to enter into this formal level of partnership. After the appropriate tribal agreements and/or resolutions are in place, one of the final first steps in forming meaningful conservation relationships with tribes is to create a partnership work plan.

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

Conclusion

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

In another example, more than two dozen Tribes formally requested President Barack Obama to declare the 1.9 million acre (approx. 809,000 ha) Bears Ears sacred site (between Utah and Arizona, United States) as a national monument in October 2015. Under a unique plan involving nation-to-nation collaboration, it may be the first truly collaborative land management effort between Native Americans and the U.S. federal government (Minnard 2015). The Sierra Club and other prominent NGOs have pledged their support to the Bears Ears movement, setting a high bar for further environmental collaboration between the U.S. federal government and Native Peoples.

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

References

Aragon, D. 2007. The Wind River Indian Tribes. International Journal of Wilderness. 13(2): 14–17.

Arizona Conservation Corps. 2024. https://azcorps.org/. [Accessed 2024 August 30].

Arizona Sonora Desert Museum. 2024. https://desertmuseum.org/. [Accessed 2024 August 30].

Conservation Legacy. 2024. https://conservationlegacy.org/. [Accessed 2024 August 30].

Erickson W.P. 1994. Sharing the desert: The Tohono O'odham in history. Tucson, AZ: University of Arizona Press.

Hansen, G.F. 2016. First steps to meaningful and lasting relationships with Native Peoples. International Journal of Wilderness. 22(1).

Tohono O'odham Community College. 2024. About us. https://www.tocc.edu/about-us. [Accessed 2024 August 30].

Tohono O'odham Nation. 2024. Official website of the Tohono O'odham Nation. http://www.tonation-nsn.gov/. [Accessed 2024 August 30].

Minnard, A. Page last modified: 2015 December 1. Tribes ask President Obama to designate Bears Ears as National Monument. https://indiancountrytodaymedianetwork.com/2015/10/15/tribes-ask-president-obama-designate-bears-ears-national-monument-162096. [Accessed 2024 August 30].

Wilderness Ranger Advisory Groups: Bridging Gaps Between the Field and National Leadership

BY LISA JENNINGS, TANGY EKASI-OUT, COLTER PENCE, ERIC SANDENO, and DUSTY VAUGHN

Background

Field-based advisory groups allow local managers to work directly with national-level leaders so their voice can be heard while gaining a better understanding of national-level decision-making processes. The Forest Service has developed two such teams to help bridge the gap between the Chief of the Forest Service in Washington, D.C. and the Wilderness Ranger in the field. The Chief's Wilderness Advisory Group (WAG) and Wilderness Information Management Steering Team (WIMST) are two national-level teams made up of field-level wilderness managers who work directly for a national forest.

Both teams aim to address field-level issues and concerns wilderness managers are facing and inform national program priorities. The voices of these wilderness field rangers fill a niche in connecting the field to the highest levels of the agency. Each November, both groups meet to plan out the program of work for the year, including sharing common needs for tools, templates, and other materials from each region of the Forest Service. The Chief and Deputy Chief are invited to participate in the November meeting to provide input on the work being planned.

The WAG was first formed in 1989 after a U.S. Government oversight agency (Government Accounting Office) issued a report stating the Forest Service may have been devoting only minimal attention (budget and staff) to wilderness management. To address concerns in the report, then Forest Service Chief Mike Dombeck supported the development of a group who could provide field-level recommendations to improve wilderness management directly to the Chief. The WAG grew slowly in its first few years with only a handful of tasks being addressed. In 1999, then Forest Service Chief Dale Bosworth placed a greater emphasis on the need for the WAG to advise the Chief and the National Leadership Team about challenges faced by wilderness managers and rangers. Since 1999, the WAG has had a prominent role in guiding wilderness management for the Forest Service.

When the WAG was re-launching in 1999, a new field-based team, WIMST, was created to develop a performance measure for wilderness stewardship. This was in line with the Government Performance and Results Act of 1993, which required agencies to develop a performance-based budget process. WIMST was chartered with developing a wilderness-specific performance measure, monitoring protocols, and a corresponding database to track accomplishments towards the performance measure. Once the performance measure launched in 2001, the need for WIMST remained, but the primary purpose of WIMST changed to provide support, guidance, and quality control of the performance measure. With advances in technology, such as web-based information sharing and GIS mapping tools, there was also a greater need for WIMST to provide oversight on wilderness information management activities in the Forest Service's wilderness program at both strategic and tactical levels. Today, the goal of the team's work is to improve wilderness conditions and to inform sound wilderness stewardship decisions by providing line officers and staff with the information they need.

While the two teams were initially formed with different purposes, they often work together to support each other as they work to achieve a similar end result: improved conditions for field managers and the wilderness resource.

Charter and Organization Structure

The Chief's WAG and WIMST share many characteristics around how they are chartered and organized. Both groups primarily consist of field wilderness managers familiar with the needs of field units, employees, and partners. The composition of the groups includes one representative per Forest Service administrative geographical region. There are nine Forest Service Regions. The regions are broad geographic areas, usually including several states, encompassing 155 National Forests and 20 National Grasslands. These lands include a vast treasure of diverse landscapes, ecosystems, fauna, and flora. Regional representatives are appointed by their regional wilderness program manager. The team may contain other ad hoc members who serve on the team as needed to fill specific roles, such as representatives from other programs, partners, the Arthur Carhart National Wilderness Training Center, Aldo Leopold Wilderness Research Institute, Wilderness Connect, and academia.

The common responsibilities shared by both groups are:

1. to advise the Chief, the National Forest System Deputy Chief, and the Director of Wilderness & Wild and Scenic Rivers on the overall status of the Forest Service's wilderness stewardship program;
2. identify successes or problems in the program's implementation;
3. provide strategic and tactical recommendations for program enhancement.

Members work on tasks that will benefit the wilderness stewardship program in the near and long term. Additionally, they provide periodic input, from the perspective of field wilderness managers, to inform the programs of work of the Aldo Leopold Wilderness Research Institute and the Arthur Carhart National Wilderness Training Center.

The program of work for each group is developed annually during an in-person meeting, which is typically held in the fall at the start of the agency's fiscal year. The tasks undertaken are decided upon by the group membership and informed through input from other field wilderness managers, the regional wilderness program managers, Washington Office Wilderness & Wild and Scenic River Staff, and representatives from the Arthur Carhart National Wilderness Training Center and the Aldo Leopold Wilderness Research Institute.

Members participate in-person at an annual meeting, and as many of the monthly conference calls as they can. Their active participation in the group decision-making process is crucial and they support decisions made by the group at large. They are tasked to identify and prioritize actions that would be of benefit to the wilderness program, at all levels of the organization. They work in sync with their regional wilderness program managers to keep them abreast of the group's activities and to learn about issues of concern that might inform the program of work. Members also provide a two-way communication flow with other field-level managers in their regions. This eases transitions and onboarding of new members by building relationships that foster a culture of mentoring and support. The last key piece of the working group's network includes other field-based advisory groups within the agency, such as the Trails Advisory Group, to ensure projects are timely, compatible with other program efforts, and not redundant.

Confident they have developed a well-informed program of work, members serve on 1–3 specific task sub-teams, typically working on two tasks per year. These teams meet remotely, as needed, and individuals work independently to make progress on these tasks throughout the term. The workload requires approximately 40

hours of work per year. The salary for each member is expected to be covered by their region or home unit based on their regional agreement. Travel and per diem expenses for the annual meeting are covered by the home unit and when funding is available, the Regional Office and/or Washington Office assists with travel expenses.

Chief's Wilderness Advisory Group

The Chief's WAG was established in 1989 for the purpose of providing advice and counsel to the Chief of the Forest Service on matters related to wilderness stewardship from the perspective of field-level managers.

Members serve two-year terms. It is expected that a few regional representatives will continue to serve on the Chief's WAG for a second term to provide a measure of consistency in group operations, with the goal of having at least three members from the previous WAG carry over to the subsequent term. Generally, field-level Chief's WAG members will not serve longer than two consecutive full terms in order to provide the opportunity for others in their region to participate. Members beginning in the middle of a term to fill a regional vacancy may elect to serve an additional full term—a total of five years—if they have the support of their host forest and regional office.

The group selects members to serve as Chair and Vice-Chair from the regional membership. The Chair has responsibility to provide leadership for the group, to manage the meetings, and to hold the membership accountable for making progress on the program of work. The Chair of the Chief's WAG briefs the Chief of the U.S. Forest Service on recommendations from the membership, with the goal of one meeting per year.

The Washington D.C. Office Liaison has the responsibility to assist in managing the group. This role is intended to ensure the group is successful in their endeavors by assisting with strategic and tactical planning, as well as general meeting management and group administration. The goal is to coach group effectiveness and to provide long-term consistency to the group's activities. At appropriate times, the Washington D.C. Office Liaison shares information on the Chief's and Washington D.C. Office priorities to assist with determining group tasks and work priorities.

Wilderness Information Management Steering Team

The purpose of WIMST is to promote quality wilderness stewardship at all levels of the organization through the effective and efficient use of information/data. This is accomplished by providing support and guidance for information management activities in the wilderness program at both strategic and tactical levels. The ultimate goal of the team's work is to ensure that field rangers have sufficient information to make informed decisions related to wilderness stewardship, and the public has the information needed to enjoy and appreciate the full benefits of wilderness.

The scope of topics addressed by the WIMST is quite broad, addressing many different cross-cutting, multi-regional, and national issues. The scope can be summarized as encompassing information management planning, data collection, data storage and analysis, and information presentation and use.

The team is led by the National Wilderness Information Manager who serves as the Chair. The Chair reports to the Director of Wilderness & Wild and Scenic Rivers. A Vice-Chair may also be designated, at the discretion of the Chair or as voted upon by other members at the annual meeting. Representatives do not have a term limit.

Key relationships that WIMST manages include Wilderness Connect (https://wilderness.net) to help convey important information to the public and agency employees through annual updates and support to online resources, as well as the agency's internal upward reporting database, Natural Resource Management (NRM). Wilderness Connect is a communications, education, and science dissemination program administered through a collaborative partnership between The Wilderness Institute at the University of Montana, the Arthur Carhart National Wilderness Training Center, and the Aldo Leopold Wilderness Research Institute. It is advised by a working group and steering committee with oversight provided by the federal interagency National Wilderness Steering Committee and Wilderness Policy Council.

Products

Examples of the work of the Chief's WAG and WIMST are provided below, organized into the four components of the *Rangers for 30 by 30 Framework* developed by the International Ranger Federation, Universal Ranger Alliance, and other partners.

Overview of Rangers for 30 by 30 Framework

In 2022, the International Ranger Federation (IRF), the Universal Ranger Support Alliance (URSA), and other partners issued a policy note calling for the Kunming–Montreal Global Biodiversity Framework (CBD 2022) to recognize rangers as "essential planetary health workers" (IRF et al. 2022). To further support the development of a professional workforce to ensure equitable and effective management of protected and conserved areas, IRF and the other members of URSA developed a framework for support from governments, agencies, donors, and non-governmental organizations. This *Rangers for 30 by 30 Framework* defines essential requirements for the *Conditions*, *Conduct*, and *Competence* for a *Workforce* that is sufficient in numbers, diverse, and recognized (IRF and URSA 2023). WIMST and WAG have been analyzing this Framework and have developed a number of working groups and tools related to these themes. Some of these working groups and tools are presented in the following sections.

WIMST: Recognizing and Elevating Tribal Connections to Wilderness Working Group

This wilderness ranger group is focused on acknowledging and enhancing tribal connections and wilderness consistent with the Framework and the Forest Service Tribal Action Plan (USDA Forest Service 2023). The Tribal Action Plan provides agency guidance and assistance to fulfill the Federal trust responsibility, honor treaty obligations, and support Tribal self-determination. Tools that have been developed include:

Inclusive and Respectful Language Evaluation Tool for Wilderness Narratives

This tool helps wilderness managers reflect on opportunities to make wilderness narratives more inclusive and address Native and marginalized group's connections to wilderness landscapes more accurately and respectfully. The goal is a more truthful and holistic portrayal of Indigenous People's past, present, and future stewardship of lands proclaimed to be federal Wilderness areas, and a deeper understanding of their connections to these landscapes. This framework is shared as a tool for wilderness rangers to use when they perform annual wilderness upward data/information reporting tasks, which include reviewing the way wilderness descriptions are developed on the Wilderness Connect website. This effort is meant to ensure that rights-based thought processes are accounted for in wilderness stewardship.

Identifying Pathways for Tribal Engagement in the Forest Service's Wilderness Stewardship Performance (WSP) Elements

Wilderness Stewardship Performance is the suite of activities the Forest Service uses to measure their wilderness stewardship accomplishments towards preserving wilderness character each year (USDA Forest Service 2020). Examples for tribal engagement in this work includes opportunities for co-stewardship, respectful application of Indigenous Knowledge and protection of sacred sites within a variety of performance elements including Water, Fish and Wildlife, Plants, Agency Management Actions, Cultural Resources, Workforce Capacity, Education, and Wilderness Character Baseline. Integrating tribal engagement pathways into wilderness stewardship work helps the Forest Service meet its goal of responsibly stewarding wilderness in an inclusive manner.

WIMST: Mini Webinars to Improve Uptake and Comprehension of WSP Working Group

This wilderness ranger group has produced 18 mini webinars to help agency wilderness rangers and partner groups better understand the fundamentals of these elements as they assist with implementing the WSP program. Subject matter experts are paired with a wilderness ranger invested in a particular performance element for an interview-style webinar where they provide an overview of the element paired with tools and advice. The webinars are promoted annually as wilderness managers and partners plan for new stewardship work and as they prepare for upward reporting. They help increase the competencies of wilderness rangers to plan and perform wilderness stewardship projects and accurately capture the accomplishment data associated with the work for upward reporting.

WAG: Fire Management in Wilderness Working Group

Fire management in Wilderness and wild areas has increased in frequency as wildfire risk increases across the United States. Support to the field for fire management in Wilderness has been a common theme over the years. While land management agencies also fight fire on those public lands, often the management tools in firefighting conflict with the minimal-impact values of Wilderness. Where life and property are not at risk, minimal-impact fire suppression techniques can be used to avoid permanent scars on the landscape from motorized equipment. The WAG worked with fire managers to gather best practices for these minimal-impact suppression techniques, as well as trainings, fire management plans, and best practices for resource advisors working on fires in Wilderness. This information is shared openly with practitioners through Wilderness.net.

Additional Chief's WAG and WIMST Products/Projects

Other products/projects developed by Chief's WAG and WIMST and organized by *Ranger for 30 by 30* theme include:

Conduct

- Responsibility—identify pathways for tribal engagement in the Forest Service's WSP elements.
- Accountability—utilize elements from WSP and Wilderness Character Monitoring (Landres et al. 2020) to track and report management actions and outcomes to preserve wilderness character
- Leadership—represent the field to agency through communications and meetings such as the WAG's annual Brief the Chief.
- Rights-based approaches—developed resources such as the Inclusive and Respectful Language Evaluation Tool for Wilderness Narratives

Competencies

- Knowledge—develop and share resources such as the Wilderness Connect Practitioners Toolboxes (Wilderness Connect 2025a), Wilderness Character Monitoring support tools, and conduct WSP quality control interviews
- Skills—co-host and present skills trainings at National and regional Wilderness Skills Institutes (Wilderness Skills Institute 2025) and ranger academies.
- Attitude—provide peer-to-peer support and networking venues for field input on national priorities
- Training and learning—assisted with developing training curriculum and guides such as the Wilderness Ranger Field Guide (Arthur Carhart National Training Center 1993); assist with the development of the Competency Areas for Wilderness Stewardship Specialists (Wilderness Connect 2025b) and associated training.

Conditions

- Fair terms of employment—advocate for temporary to permanent employment
- Right to decent work, safe workplace, and equipment—advocate for safe and affordable housing and government housing rebate; improve field uniform components.
- Ensured equality and equity—develop and share resources, case studies, and success stories

Workforce

- Professionalization—development of the WSP Workforce Capacity element and 0301 Series Position Descriptions to develop the professional capacity of the wilderness workforce (Wilderness Advisory Group Members 2013).
- Adequate numbers—the WSP Workforce Capacity element identifies a framework for evaluating if there is adequate staffing levels for wilderness stewardship.

- Formal recognition—the national wilderness program office facilitates annually the granting of National Wilderness Awards, which showcase exemplary leadership in stewardship of the wilderness resource and recognize outstanding efforts toward WSP, Wilderness Character Monitoring, and other wilderness stewardship goals (Wilderness Connect 2025c).
- Established standards—wilderness program complexity rating is a framework for evaluating the complexity of various wilderness unit's program of work; the complexity level of a wilderness unit can inform prioritization of stewardship resources.

Brief the Chief

The Chief's WAG annually meets with the chief of the Forest Service to present field perspectives on wilderness stewardship in the Forest Service. WAG is a team of field-based managers from each National Forest Region. Additional representatives serve on the committee from the regional recreation directors, the Washington Office, the Arthur Carhart National Wilderness Training Center, and the Aldo Leopold Wilderness Research Institute. The WAG acts as a conduit between field-level managers and national wilderness leadership. In addition to providing support and assistance to the field, it also provides ideas and suggestions to leadership. WAG Chair Lisa Jennings and Co-Chair Jonathan Brooks last briefed former Chief of the Forest Service, Randy Moore, on a range of topics, including:

- Celebrating 2024 as a uniquely important year for Wilderness; for example, convening and celebrating the Gila Wilderness' 100th birthday, 60th anniversary of the signing of the Wilderness Act, the World Wilderness Congress, and September as National Wilderness Month;
- Emphasizing the importance of WSP and Wilderness Character Monitoring; these two programs demonstrate the interdisciplinary management that Wilderness requires to ensure the agency continues to preserve wilderness character for current and future generations;
- Highlighting the importance of growing, training, and retaining a more diverse workforce. Traditional skillsets (e.g., use of axes, crosscut saws, and pack stock) are critical for wilderness stewardship and important to pass down to the next generation of Forest Service employees through training and mentoring;
- Working with fire programs around training and planning including efforts to support Wildfire Crisis Strategy (WCS) landscapes for Wilderness; WCS landscapes include 84 Wilderness areas.

After an engaging conversation, the Chief thanked WAG for their work and asked a series of questions meant to challenge and stimulate connections for Forest Service wilderness stewards. These questions may be useful for other wilderness stewards to contemplate, and are offered here for consideration:

- What draws you in to wilderness?
- How do we view wilderness into the future as we continue to see increasing challenges around growing populations and fire?
- What can we do now to preserve wilderness character for future generations?
- How can we grow partnerships that support wilderness stewardship?
- How can leaders at every level of the agency support wilderness?

Reflections

Given the successes and accomplishments of the Forest Service's field ranger groups in addressing field-level issues and concerns that wilderness managers are facing as well as advocating for resources to help inform national program priorities, we share some reflection questions that may be useful for other organizations considering the role and empowerment of field ranger groups:

- Who are "field rangers" in your organization? What titles, position descriptions/roles, duties do they have?
- How can field rangers organize and act in a collective manner within the traditions of your organization?
- Are there examples of field rangers influencing leadership/decisions/perspectives in your organization? What are the pathways for that influence?
- Are there examples of leadership within your organization engaging directly and consistently with field ranger? What do those examples look like?
- How could field rangers collaborate together and influence leadership in your organization?
- What barriers exist in your organizational structure which prevent or slow communication from and to field staff?
- What topics (e.g., workforce development, working conditions, conduct, competencies/skills) might field rangers best focus their collective effort on in your organization?

References

Arthur Carhart National Training Center. 1993. USDA Forest Service. Wilderness ranger field guide. https://www.umt.edu/media/wilderness/toolboxes/documents/ranger/Wilderness%20Ranger%20Field%20Guide.pdf [Accessed 2025 July 27]

CBD. Convention on Biological Diversity. 2022. Kunming–Montreal Global Biodiversity Framework. CBD/COP/DEC/15/4. Secretariat of the Convention on Biological Diversity, Montréal, Canada. https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf [Accessed 2025 July 1]

IRF and URSA. International Ranger Federation and Universal Ranger Support Alliance. 2023. Rangers for 30 by 30: A professional workforce to guarantee equitable and effective management of protected and conserved areas (revised version). International Ranger Federation and Universal Ranger Support Alliance. https://www.internationalrangers.org/wp-content/uploads/2023/11/URSA-Ranger-30x30-final-new.pdf. [Accessed 2025 July 1]

IRF, the Thin Green Line Foundation, and URSA. 2022. Essential planetary health workers: Positioning rangers within global policy. https://www.ursa4rangers.org/download/1210/?tmstv=1671783842 [Accessed 2025 July 1]

Landres, P.; Boutcher, S.; Mejicano, E.; Sandeno, E., tech. eds. 2020. Wilderness character monitoring technical guide. Gen. Tech. Rep. RMRS-GTR-406. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

USDA Forest Service. 2020. Wilderness stewardship performance guidebook. Version 2020.1 https://www.umt.edu/media/wilderness/NWPS/documents/FS/WSP-Guidebook_v2020.1.pdf [Accessed 2025 July 27]

USDA Forest Service. 2023. Strengthening tribal consultations and Nation-to-Nation relationships: A USDA Forest Service action plan. FS-1211. https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Strengthening-Tribal-Relations.pdf [Accessed 2025 July 1]

Wilderness Advisory Group Members. 2013. The Forest Service wilderness career ladder: In search of the missing rungs. https://www.umt.edu/media/wilderness/NWPS/documents/FS/WAG_Wilderness%20career%20ladder.pdf [Accessed 2025 July 27]

Wilderness Connect. 2025a. Toolboxes https://wilderness.net/practitioners/toolboxes/ [Accessed 2025 July 1]

Wilderness Connect. 2025b. Competency areas for wilderness stewardship specialists. https://wilderness.net/practitioners/training/wilderness-technical-core-competencies/competency-areas/ [Accessed 2025 July 1]

Wilderness Connect. 2025c. Forest Service agency resources. https://wilderness.net/practitioners/agency-resources/forest-service/ [Accessed 2025 July 1]

Wilderness Skills Institute. 2025. https://wildernessskillsinstitute.org [Accessed 2025 July 1]

Environmental Stewardship Through Volunteer-Collected Data

BY ALISON A. ORMSBY, ALISA FUTRITSKI, and SAMANTHA SMITH

Abstract

Participatory data collection is a way to actively involve community members in research about natural areas that directly contributes to conservation outcomes. This paper covers two Adventure Scientists initiatives in wilderness areas: the Wild and Scenic Rivers Project and the Wilderness Study Area Monitoring in Grand Staircase-Escalante. Adventure Scientists' Wild and Scenic Rivers Project collected water quality data in prioritized locations across the National Wild and Scenic Rivers System. From 2020 to 2023, volunteers completed 1,381 surveys across 197 rivers. This inventory of over 11,000 miles of the Wild and Scenic Rivers system supported improved multi-level partnerships and informed policy and management of the nation's waterways. In 2024, Adventure Scientists' volunteers collaborated with the organization Grand Staircase Escalante Partners to monitor three Wilderness Study Areas in Grand Staircase-Escalante National Monument to document signs of human disturbances, such as off-road vehicle use, trash, and graffiti. The results of this project will aid management and stewardship efforts to help maintain the wilderness characteristics in the national monument areas. These projects exemplify how volunteer-collected data can support large-scale conservation efforts and reinforce environmental stewardship.

Introduction

Federal public lands in the United States include national parks, wildlife refuges, wilderness areas, national forests, and the national system of public lands. Wilderness areas are the most strictly regulated type of federal public lands in the United States. Public lands provide opportunities for people to witness and experience unique, scenic, and wild landscapes. These lands are valued for reasons that include recreation, resource extraction, fisheries and wildlife, and water resources. Public lands attract visitors, particularly to the west of the United States, where approximately half of the country's public lands are located. However, some public lands are understaffed, or have research needs that cannot be addressed by land managers. This is where trained public volunteers can help address research questions and gather data to share with the land managers to support conservation goals.

The vast size and ecological diversity of public lands are key resources that counter increasing pressures on natural resources. Urban and suburban sprawl and the effects of climate change have destroyed and degraded habitats. Additional impacts include threats to native species, compromised water sources, and increased risks of wildfire on public and adjacent private lands. Other impacts stem from growth in human population and consump-

Alison Ormsby, *PhD, is Associate Director of Design/Forest Specialist with Adventure Scientists in Bozeman, Montana, USA.* ***Alisa Futritski*** *is Senior Manager, Volunteer Recruitment and Community Engagement with Adventure Scientists in Bozeman, Montana, USA.* ***Samantha Smith*** *is Project Coordinator with Adventure Scientists in Bozeman, Montana, USA.*

tion, including higher rates of resource extraction and threats to public lands from mining, logging, and ranching practices. Furthermore, increases in the presence of various pollutants and invasive species continue to encroach on public lands (Wilson 2014).

This article presents the results of two citizen science projects in wilderness areas that were coordinated by Adventure Scientists. Adventure Scientists is a non-profit organization with a mission to "ensure the availability of critical field data that accelerates conservation and climate solutions" (Adventure Scientists 2024). The organization mobilizes and trains volunteers to collect high-quality scientific data that are difficult to access, require too large a scale, or are too costly to obtain with traditional methods.

Citizen science is scientific research that is conducted, in whole or part, by volunteers and nonprofessional scientists. It is also referred to as crowd science, crowd-sourced science, volunteer monitoring, community science, and participatory monitoring or research. The contribution of citizen science to research has been found to be greater than perceived. With appropriate training and oversight, volunteers can collect data with quality that is equal to that collected by experts (Bonney et al. 2014).

Citizen science can help improve conservation policies and outcomes, through contributing to scientific knowledge and getting the public engaged in conservation and natural resource management. Community involvement in data collection also helps facilitate the inclusion of diverse perspectives into management and to foster environmental stewardship (McKinley et al. 2017).

Project Results

Wild and Scenic Rivers Project

Established in 1968, the National Wild and Scenic Rivers (WSR) System includes over 13,400 miles of rivers (USDA, n.d.). These rivers are set aside based on three main characteristics: their free-flowing nature, pristine water quality status (or ability to achieve this), and other outstandingly remarkable values that are unique to each river. Those qualities could be unusual or notable geology, scenery, wildlife, or fishing or recreation opportunities.

The scale of the national WSR system, combined with access challenges and limitations in state and federal agency capacity, contribute to nationwide data gaps. These data gaps have implications for both the agencies tasked with protecting the rivers and for the rivers themselves. A report by the Interagency Wild and Scenic Rivers Coordinating Council revealed that "there has been no comprehensive effort to assess the state of water quality within the National WSR System" (Willi and Back 2018: 4). In particular, about 38% of the national system has unassessed or unknown water quality, and an additional 44% has identified impairments (Willi and Back 2018). Even on accessible rivers, states have gap years before returning to monitor established field sites that only cover a small portion of their surface waters. This means that available information and reporting regarding the water quality status of rivers is sparse. There is a need to address these data gaps and conduct regular monitoring, as the WSR system has proportionately more impaired waters than other rivers across the United States (Willi and Back 2018).

To address this problem and enhance decision-making capacity by federal and state agencies, Adventure Scientists developed a framework for collecting water quality data throughout the WSR system. The goal of Adventure Scientists' WSR project was that twice, over a four-year project period, Adventure Scientists volunteers collected water quality data on all of the federally-recognized WSR segments designated as either unassessed or unknown. Data were also collected on prioritized impaired status segments.

The WSR project addressed data gaps and updated the water quality statuses of rivers across the United States to improve the management and protection of WSR. Between June 2020 and February 2023, Adventure Scientists managed the training and data collection process of 479 volunteers. Across 25 states, volunteers visited 197 WSR located on federal and state land (Figure 1). Volunteers completed 1,381 surveys that included field measurements of pH, total dissolved solids, salinity, temperature, and dissolved oxygen. Adventure Scientists partnered with the United States Forest Service (USFS), Bureau of Land Management (BLM), National Park Service (NPS), and state water quality agencies to identify project priorities, design protocols and volunteer training materials, and obtain permits. This project supports strong interagency collaboration and engages community members in the scientific process. Its data allow land managers to determine any necessary status changes of WSR and inform decision-making.

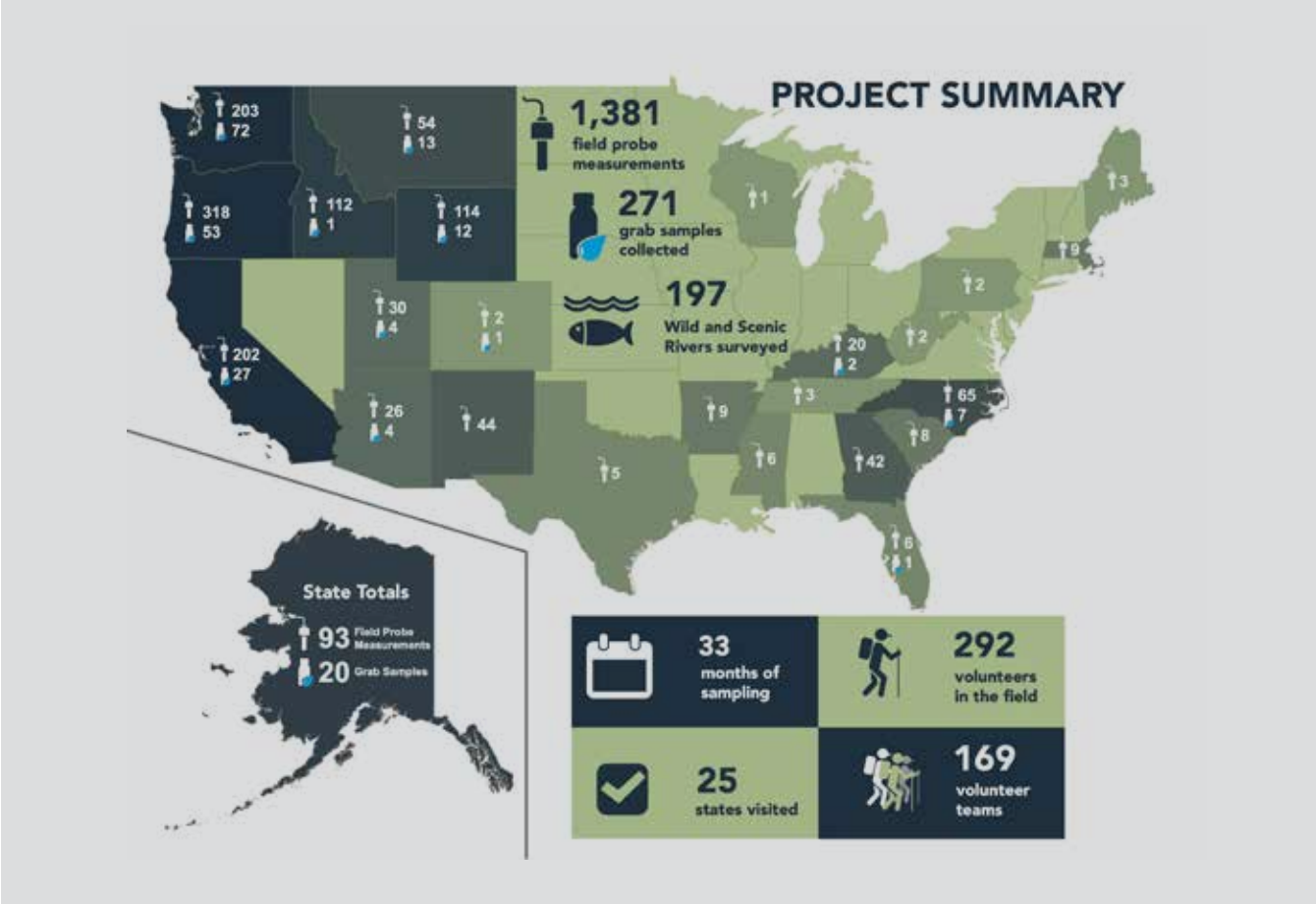


Figure 1 - Scope of the Wild and Scenic Rivers Project (photo: Adventure Scientists).

Volunteers collected water quality data using grab samples and probes. A grab sample is a sample of open water collected at a specific time and location, which was noted by each volunteer. Volunteers collected 217 grab samples in open water (Figure 2) for lab analysis and conducted qualitative habitat and invasive species surveys. Adventure Scientists' staff recruited, trained, and managed volunteer teams, maintained and managed equipment, coordinated with interagency and state partners, and compiled and displayed data in web portals accessible by volunteers, project partners, and the general public.

Figure 2- Utah volunteer collecting grab samples for the Wild and Scenic River project from the Green River along Swasey's Beach (photo: L. Hunt).

Figure 3 - Two volunteers who hiked along the Noatak and Alatna Rivers in Alaska in August 2021 to collect data for Wild and Scenic Rivers (photo: M. Herring).

Data collection occurred during two field seasons each year: April to August, and October to February (Figure 3). Adventure Scientists received samples and data throughout the field seasons. All gear and equipment were returned to Adventure Scientists and calibrated during the months of September and March.

Volunteers collected data approximately every 13 miles on unassessed and/or unknown WSR segments (Figure 4). Once the project was completed, volunteers responded to surveys and provided feedback on their experience. As one volunteer in Oregon expressed, "I loved the experience of adventuring up tributaries I never would have explored if the goal to collect water samples hadn't existed. We went to such magical places just to take our samples!"

Figure 4 - Oregon volunteers gathered water quality data along Wasson Creek using a probe and the Adventure Scientists' detailed methods booklet (photo: J. Daniels).

Of the volunteers who responded to the survey, 87% agreed or strongly agreed that they protected a place that was important to them. As one volunteer from Idaho shared: "what struck me was how being obligated to take water quality readings at regular intervals made me stop in places that I otherwise would have just rolled by. It gave me the opportunity to pause and take in the pleasure of being out on a river beyond the ways and places I expect to do that. It helped the good fortune of being on such a trip sink in a little deeper. And taking a small action to care for the river deepened my care for the place. As is often the case, volunteering for something you believe in makes you want to give more to that thing or place."

Wilderness Study Area Monitoring in Grand Staircase-Escalante

Often cited as the most remote area in the Lower 48, Grand Staircase-Escalante National Monument (GSENM) is almost entirely made up of Wilderness Study Areas, which are management zones that have been put aside to one day be considered for designation as Wilderness Areas by Congress. This national monument celebrates the lands of many Indigenous communities, including the Hopi, Zuni, Dine/Navajo, San Juan Southern Paiute, Kaibab Paiute, Ute, Ute Mountain Ute, Jemez Pueblo, and Acoma nations (GSEP 2024). The land holds countless artifacts, artwork, historical, and present-day connections to these communities. On this project, Adventure Scientists partnered with Grand Staircase Escalante Partners (GSEP) and BLM, to monitor three Wilderness Study Areas for disturbances such as off-road vehicle use, dispersed camp areas, trash, structures, and graffiti (Figure 5).

Figure 5 - A sign marks the first steps into a Wilderness Study Area near the town of Escalante, Utah (photo: D. Maclure).

During May 2024, volunteers joined staff from Adventure Scientists and GSEP to monitor and survey these Wilderness Study Areas. Sixteen volunteers participated in extensive training and subsequent surveying and data collection (Figure 6). On the first two days, volunteers learned about the history and importance of the Grand Staircase Monument, the data collection methods, and the impact of their participation. As one volunteer from Indiana shared, "while I'm helping nonprofits in their missions to conserve these areas, it's also very enriching for myself to grow as a person. It goes hand in hand—personal growth along with protecting these places. It's a spiritual experience."

Volunteers then separated into pairs and embarked on multi-day backpacking, hiking, and overland surveying trips (Figure 7) throughout the monument, using the Survey123 app and detailed protocols to monitor human disturbances within the Wilderness Study Areas. Volunteers documented the following intrusions and disturbances in the Wilderness Study Areas: Off-Highway Vehicles/motorized recreation use/vehicle trespassing; erected camp areas; graffiti/vandalism; large modern trash; and human-made structures. They also noted wilderness characteristics, including structures, ecological impacts, solitude, and primitive and unconfined recreation.

When asked about their motivations for joining the project, volunteers from Iowa commented: "protecting the places that we love or are experiencing for the first time means to… make sure that other people 100 years from now can experience the same awe-inspiring immersion in nature that we've found here. It is because of people many years in the past that… we are able to enjoy them today. It is our duty to do the same for generations in the future."

Figure 6- Volunteers learn to chart their course on backpacking routes (photo: D. Maclure).

Figure 7- Volunteers participate in a trial survey on a hike through a Wilderness Study Area (photo: D. Maclure).

The successful data collection from this project will be used to aid in management and stewardship efforts to maintain wilderness characteristics in these areas. By monitoring these Wilderness Study Areas, GSEP and BLM are able to support co-stewardship for this landscape, with respect and reciprocity for tribal communities, and ensure that the interests and priorities of tribal communities are considered in management policies and decisions (GSEP 2024). On the impact of this work, one volunteer from Utah noted: "with the pressures of population growth… these open places are so special for people to be able to get out and experience the natural world, and [this helps] preservation for native species and the Native Americans who were here long before us."

Discussion and Conclusion

In summary, volunteers in both projects felt that their efforts have impact and that they are making direct contributions to science. Conservation action data from many years of post-project Adventure Scientists volunteer surveys reveal that after participating in a citizen science project, 29% of volunteers take greater conservation action in their own lives.

Citizen science is a powerful tool to support wilderness conservation, fueled by community volunteers. The contribution of volunteers in parks collecting citizen science data to influence park management decisions has been documented (Andow et al. 2016; Ryan et al. 2001). As Lin and Ormsby (2021) documented, with ongoing budget cuts for parks and increased park acreage, volunteers can fill roles that support the work of ranger staff. For example, volunteers can help with mapping invasive plants in parks (Jordan et al. 2012). The type of training that volunteers receive can impact on the quality of data collected (Dickinson et al. 2010). The volunteers for Adventure Scientists projects first sign up through the organization's community science platform on its website. Then, they typically participate in an asynchronous online training course that takes 20–30 minutes to complete. If gear is needed for the project, it is mailed to volunteers at no cost to the volunteer. Volunteers collect project data using a specially tailored phone application created by Adventure Scientists staff. Physical data samples are shipped directly to research partners and collaborating laboratories for processing.

Similar to the two projects led by Adventure Scientists, McKinley and colleagues (2017) documented that participation in a community science project can lead to people making different personal choices and changing their own management practices, as well as spreading new knowledge to a social circle and setting an example for behavior change for others to follow. Participation in projects also improves personal science literacy and builds expertise through the training.

Nature access is important—it benefits individuals physically, mentally, and emotionally. One way to increase access to nature is through volunteer involvement in citizen science opportunities. Studies show that human involvement with nature creates an increased awareness of the natural world (Frantz et al. 2005; Kals et al. 1999). Public lands allow access to nature, influencing an individual's view of the natural world. For society as a whole, there are both environmental and social effects from spending time outdoors. Better concentration (Taylor et al. 2002; Wells 2000) and coping with upsetting events (Wells and Evans 2003) are benefits of nature access, along with more cooperative and creative social interactions (Herrington and Studtmann 1998; Kirkby 1989; Taylor et al. 1998).

It is recommended that scientists and organizations continue to collaborate with local communities and trained volunteers to create support for conservation and make data-driven environmental management decisions. By engaging volunteers in hands-on scientific research, they not only contribute to the understanding and management of public lands, but also cultivate a personal commitment to conservation.

Acknowledgements

We are grateful to all of our volunteers, project partners, and supporters.

References

Andow, D.A.; Borgida, E.; Hurley, T.M. [et al.]. 2016. Recruitment and retention of volunteers in a citizen science network to detect invasive species on private lands. Environmental Management. 58(4):606–618. doi:10.1007/s00267-016-0746-7

Adventure Scientists. 2024. Who we are & what we stand for. https://www.adventurescientists.org/mission-and-values.html [Accessed 2024 April 30]

Bonney, R.; Shirk, J.L.; Phillips, T.B. [et al.]. 2014. Next steps for citizen science: strategic investments and coordination are needed for citizen science to reach its full potential. Science. 343(6178): 1436–1437. doi:10.1126/science.1251554

Dickinson, J.L.; Zuckerberg, B.; Bonter, D.N. 2010. Citizen science as an ecological research tool: challenges and benefits. Annual Review of Ecology, Evolution, and Systematics. 41: 149–172. doi:10.1146/annurev-ecolsys-102209-144636

Frantz, C.; Mayer, F.S.; Norton, C.; [et al.]. 2005. There is no "I" in nature: the influence of self-awareness on connectedness to nature. Journal of Environmental Psychology. 25(4): 427–436. doi:10.1016/j.jenvp.2005.10.002

GSEP. Grand Staircase Escalante Partners. 2024. Native Perspectives. https://gsenm.org/native-perspectives/

Herrington, S.; Studtmann, K. 1998. Landscape interventions: New directions for the design of children's outdoor play environments. Landscape and Urban Planning. 42: 191–205. doi:10.1016/S0169-2046(98)00087-5

Jordan, R.C.; Brooks, W.R.; Howe, D.V.; [et al.]. 2012. Evaluating the performance of volunteers in mapping invasive plants in public conservation lands. Environmental Management. 49(2):425–434. doi:10.1007/s00267- 011-9789-y

Kals, E.; Schumacher, D.; Montada, L. 1999. Emotional affinity toward nature as a motivational basis to protect nature. Environment and Behavior. 31(2): 178–202. doi:10.1177/00139169921972056

Kirkby, M.A. 1989. Nature as refuge in children's environments. Children's Environments Quarterly. 6(1): 7–12.

Lin, J; Ormsby, A.A. 2021. Evaluating the impacts of volunteers serving public lands. Parks: the International Journal of Protected Areas and Conservation. 27(1): 25–34. doi:10.2305/IUCN.CH.2021.PARKS-27-1JL.en

McKinley, D.C.; Miller-Rushing, A.J.; Ballard, H.L. [et al.]. 2017. Citizen science can improve conservation science, natural resource management, and environmental protection. Biological Conservation. 208: 15–28. doi:10.1016/j.biocon.2016.05.015

Ryan, R.L.; Kaplan, R.; Grese, R.E. 2001. Predicting volunteer commitment in environmental stewardship programmes. Journal of Environmental Planning and Management. 44(5): 629–648. doi:10.1080/09640560120079948

Taylor, A.F.; Kuo, F.E.; Sullivan, W.C. 2002. Views of nature and self-discipline: Evidence from inner city children. Journal of Environmental Psychology. 22(1): 49–63. doi:10.1006/jevp.2001.0241

Taylor, A.F.; Wiley, A.; Kuo, F.E.; [et al.]. 1998. Growing up in the inner city: green spaces as places to grow. Environment and Behavior. 30(1): 3–27. doi:10.1177/001391659830100

USDA. United States Department of Agriculture. [N.d.]. Wild & Scenic Rivers.

https://www.fs.usda.gov/managing-land/wild-scenic-rivers

Wells, N.M. 2000. At home with nature: Effects of "greenness" on children's cognitive functioning. Environment and Behavior. 32(6): 775–795. doi:10.1177/00139160021972793

Wells, N.M.; Evans, G.W. 2003. Nearby nature: A buffer of life stress among rural children. Environment and Behavior. 35(3): 311–330. doi:10.1177/0013916503035003001

Willi, K.; Back, J. 2018. Evaluation of state water quality assessments and the National Wild and Scenic Rivers System. https://www.rivers.gov/sites/rivers/files/2023-07/state-water-quality-assessments.pdf

Wilson, R.K. 2014. America's public lands: From Yellowstone to Smokey Bear and beyond. Maryland: Rowman and Littlefield.

Section 5

Appendix A

Appendix A:
12th World Wilderness Congress Resolutions

The World Wilderness Congress is unique among civil society environmental forums as it provides the public a direct and concrete instrument for setting the global environmental agenda: resolutions. All WILD12 delegates–participants were invited to join in the resolution process by engaging with other delegates in polite and purposeful conversation and meaningful attempts to find common ground. Unity of purpose is essential for the success of any coalition, and the World Wilderness Congress is an instrument to help global civil society find such unity on the next steps we can and should take as an international wilderness movement.

At the 12th World Wilderness Congress (WILD12), twelve resolutions were voted on and accepted by delegates.

The Hé Sapa
RESOLUTION 1

On Sovereignty and Wilderness: Deepening the Wilderness Concept Through Indigenous Knowledge and Wisdom

PREAMBLE
Given the reality that wild nature on land, water, and sea is fast disappearing and is an irreplaceable necessity for the health and well-being of all life, we recognize the urgent need for all people to have a common language that can support a call-to-action for the preservation of Earth's biosphere. To generate this consistency, the Westernized concept of 'wilderness' needs to evolve, deepen, and strengthen through recognizing and reflecting Indigenous science, knowledge, thought, and wisdom. The He Sapa Declaration, upon which this resolution is based, provides more context, and asks no tribe, nation, or person to replace their word for free nature. It asks that the evolved concept of wilderness called for in this resolution – one that acknowledges the sovereignty of all lifeforms and is inclusive of Indigenous perspectives -- be accepted and used by Western conservation to assist with keeping nature whole, and in our collective action to safeguard the sacred, biodiverse, and sovereign nature of life on Earth.

WHEREAS
Acknowledging that many protected wilderness and other natural areas were established on lands that were and/or remain sovereign territories of Indigenous Nations; that some protected and wilderness areas were achieved in ways problematic and harmful to Indigenous peoples; and that genuine healing and reconciliation is required.

Understanding the need to adhere to Indigenous rights as enunciated in the United Nations Declaration on the Rights of indigenous Peoples (UNDRIP), as a baseline, and the Convention on Biological Diversity (especially Article 8(j)), and also to the universal need for humans to respect and act responsibly to each other and all life on Earth.

Acknowledging that many Indigenous Peoples have kept and keep wild places healthy and intact while also acknowledging Western conservation has done the same in many instances.

Accepting fully that Indigenous Knowledge and Wisdom Systems (IKWS) contain specific, place-based information, management wisdom, law, policy, and guidance.

Acknowledging that both traditional Indigenous and Western sciences are both critical informants of a more holistic philosophy and practice of wilderness conservation.

Recognizing that the current ('western') wilderness concept and related policy (the international standard of which is called Category 1B and is the responsibility of the Wilderness Specialist Group of the International Union for Conservation of Nature (IUCN) World Commission on Protected Areas) requires more depth and strengthening through close collaboration with, understanding of, and integration (in word and thought) of Indigenous Knowledge and Wisdom Systems (IKWS).

Knowing that this resolution will help transform and strengthen the broader meaning of wilderness, and in turn also increases the likelihood that Indigenous Peoples and other 'non-western' cultures can more effectively communicate with each other and build collaborative management approaches.

THEREFORE
The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED
That all relevant institutions, governments and civil society in all sectors at all levels:

A. Include language and protocols for the recognition and implementation of and responsibilities to all life, and the recognition where relevant and possible of the decision-making governance systems of regional Indigenous communities, and do so before initiating any protection concept following at a minimum Free Prior and Informed Consent (FPIC); and throughout the process of designating wilderness or other protected areas on land, water and sea.

B. Actively promote wilderness policy that acknowledges that nature is multi-dimensional, transcending the material and physical realms; and use language that honors the rights and roles of Indigenous Peoples, Indigenous Knowledge and Wisdom Systems, natural and customary law.

C. Elevate awareness of IUCN Wilderness Category 1B and associated guidelines within institutions, organizations, governments, nations, and the public at all levels as an opportunity for protected area designation and management in the future, and urge more comprehensive and far-reaching actions to initiate, integrate, and support Indigenous management or co-management and stewardship of these Category 1B Wilderness Protected Areas.

D. Adhere to the inherent sovereignty and leadership of Indigenous Peoples' stewardship of nature necessary in order to achieve the international call for protecting 30% of Earth by 2030 as specified by the Kunming- Montreal Global Biodiversity Framework and "at

least half or more[1]" recognized by IUCN Resolutions 125 and 129. Implement means for adhering to Indigenous science, knowledge, and wisdom and the best of contemporary science within a framework of legal pluralism.

E. Ensure that networks of sacred natural sites and territories sustained by Indigenous Peoples and others for ceremonial purposes, and for their intrinsic value, are a recognized part of wilderness and/or in another relevant, distinct category of protected areas.

F. Actively and publicly support and collaborate with Indigenous Peoples so that they can stay on their lands, should they wish, and prioritize the defense of their sovereignty, traditional lifeways, and the land, waters, and seas upon which they depend.

PROPOSERS

Name: Gwen Bridge
Position: Gwen Bridge Consulting
Country: Canada
Email: gwen@gwenbridge.com

Name: Vance G Martin
Position: Wilderness Foundation Global (President Emeritus)
Country: USA/South Africa
Email: vance@wildernessglobal.org

Name: Meda DeWitt and Starlyn Miller
Position: The Wilderness Society
Country: USA
Email: meda_dewitt@tws.org

Name: Ilarion Merculieff
Position: Founder, Global Center for Indigenous Leadership & Lifeways
Country: USA
Email: lmerculieff@gmail.com

Name: Shay Sloan Clarke
Position: Executive Director, Global Center for Indigenous Leadership & LIfeways
Country: USA
Email: director@gcill.world

SECONDERS

Name: Amy Lewis
Position: CEO, WILD.org
Country: USA

Email: amy@wild.org

Name: Philimon Two Eagle
Position: Executive Director, Sicangu Lakota Treaty Council
Country: *Hé Sapa*
Email: phil.twoeagle@rst-nsn.gov

Name: Tarun Chabra
Position: EDHKWEHLYNAWD Botanical Refuge
Country: India
Email: kwattein1@gmail.com

Name: Andrew Muir
Position: CEO, Wilderness Foundation Global
Country: South Africa
Email: andrew@wfa.africa

Name: Jo Roberts
Position: CEO, Wilderness Foundation UK
Country: United Kingdom
Email: jo@wildernessfoundation.org.uk

Name: Cherryl Curry
Position: CEO, Wilderness Leadership School
Country: South Africa
Email: ceo@wildernesstrails.org.za

Name: Vance G Martin
Position: Wilderness Specialist Group (IUCN, WCPA)
Country: Global
Email: vance@wildernessglobal.org

Name: Adam Hanson
Position: Sr. Conservation Network Manager
Country: U.S.A
Email: adam@wild.org

[1] International Union for Conservation of Nature. (2020). WCC-2020-Res-125-EN: Setting area-based conservation targets based on evidence of what nature and people need to thrive. IUCN. https://portals.iucn.org/library/node/49288

RESOLUTION 2

Through the Eyes of Buffalo: A Strategic Platform to Restore All Natural World Relationships

PREAMBLE

The world faces an unprecedented trebled crisis of biodiversity loss, climate change, and social injustice, with over one million species on the brink of extinction. We recognize at the heart of this crisis lies a fundamental breakdown in our relationships with ourselves, each other, and the natural world. This resolution is based on the *Through the Eyes of Buffalo Declaration,* which illuminates the challenges we face and presents an opportunity for transformative change with a campaign and policy goals. By embracing and supporting Indigenous-led bison conservation, we can restore our relationship with nature and each other, drawing on the wisdom of the past, present forces, and a bold vision for a just and equitable future.

WHEREAS

Humanity finds itself at the center of interconnected crises—biodiversity, climate, and justice—which root in a crisis of relationship with ourselves, each other, and the planet. The extraordinary juncture we collectively find ourselves offers significant opportunities for transformational change to revitalize our relationship with nature and dissolve barriers dividing us from the natural world and each other.

Not long ago, an estimated 30-60 million bison lived in dynamic equilibrium with the land we now call North America. Due to extermination efforts enforced by non-Indigenous governments in the late 1800's, only an estimated 500 individual bison were left, creating a devastating impact on bison herds, the land they lived on, and the Indigenous communities they lived in reciprocity with.

As a result of rematriation efforts by Indigenous communities and governments across North America, more than half a million bison exist in North America today. However, more than 400,000 are in commercial herds. In contrast, only about 31,000 are in conservation herds

managed by public agencies and environmental organizations and about 25,000 are in Tribal/Indigenous-managed herds.

Honoring Indigenous Peoples' relationship with the land since time immemorial and their knowledge, wisdom and science systems thus as stewards and guardians of keystone relatives and their homelands.

Indigenous-led conservation and regeneration are critical to meeting the challenges of biodiversity and climate crises and healing relational fault lines. Indigenized approaches are proven to be the best way forward for the land and all that it sustains. Eighty percent of the world's remaining biodiversity and nearly a quarter of above-ground carbon stores are on Indigenous lands[1]. Restoring bison at meaningful ecological and cultural scales mandates a conservation paradigm recognizing buffalo as a cultural species and keystone relative—a species with extraordinary effects, both measurable and immeasurable, on the biocultural system in which it lives.

Co-creating a multi-dimensional, Indigenous-led conservation and rematriation strategy centering ecological and cultural restoration of bison at a continental scale can serve as a model for relational conservation and ecosystem regeneration. Returning Buffalo revitalizes Indigenous lifeways and the full suite of grassland biodiversity, from plants and insects to prairie dogs and large mammals, and large interconnected landscapes. Understanding the need to recognize, uplift, enforce and protect Indigenous rights as enunciated in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and also to the universal need for humans to respect and act responsibly to each other and all life on Earth.

Buffalo can help us define and elevate an entirely new, Indigenous-led model to guide the next era of North American conservation. By framing conservation through a biocultural lens, we can co-create a paradigm suited to the complex, systemic challenges of the 21st century. A model that embodies concepts like relationship and reciprocity, respect and reconciliation, equity and justice. There is no better frame for this critical work than the biocultural restoration of bison, which lays the foundation for a durable conservation approach able to work effectively across the complex matrix of land ownership and rights that fragment the continent—private, public, Tribal/Nation, communal—and deliver large-scale, resilient outcomes that address the crises of our times, while healing and renewing the fractured relationship at the heart of these crises.

THEREFORE

[1] https://soe.dcceew.gov.au

The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED

That, to achieve the goal of at least one million wild bison on 100 million acres by 2050 and to further expand their numbers and range during the last half of the Century, all relevant institutions, governments, and civil society in all sectors at all levels:

A. Design and implement strategies that advance and demonstrate multi-jurisdictional partnerships for bison rematriation and stewardship.
B. Support the Indian Buffalo Management Act (IBMA).
C. Sustain and implement the United States Department of Interior's commitment to the Bison Conservation Initiative (BCI).
D. Engage in strategic international and transboundary agreements and collaborations to support continental-scale restoration of bison.
E. Establish an expanded set of Protected Area strategies and designations that help define a more equitable and enduring set of 30x30 targets.
F. Recognize and incentivize bison restoration as a Nature Based Solution.
G. Increase the social acceptance and political will needed for scaled bison restoration.
H. Establish durable funding mechanisms that reflect the ecological, cultural and social value of continental buffalo restoration.
I. Develop a strategy for conservation through reconciliation.
J. Recognize the inherent responsibility of Indigenous Peoples to steward buffalo and grasslands by honoring treaties and enforcing traditional territorial treaty boundaries.

PROPOSERS

Name: Tatewin Means
Position: Executive Director, Thunder Valley
Country: Hé Sapa
Email: tatewin@thundervalley.org

Name: Cristina Mormorunni//Issistsáakiiksi (Wolverine Woman)
(Métis/Sardo)
Position: Co-Chair/Bison Working Group
Country: USA
Email: cristina@indigenousled.org

Name: Philimon Two Eagle

Title: Executive Director, Sicangu Lakota Treaty CouncilCountry: Hé Sapa
Email: phil.twoeagle@rst-nsn.gov

SECONDERS

Name: Jason Baldes
Position: Executive Director, Wild River Tribal Buffalo Initiative
Country: Hé Sapa
Email: upon request

Name: Ernesto Enkerlin
Position: Director of Science, Organización Vida Silvestre A.C. (OVIS)
Country: Mexico
Email: upon request

Name: Raechel Wastesicoot
Position: Member, Bison Working Group
Country: Canada
Email: raechel.wastesicoot@gmail.com

Name: Curt Freese
Position: Member, Bison Working Group
Country: U.S.A
Email: upon request

Name: Amy Lewis
Position: CEO, wild.org
Country: U.S.A
Email: amy@wild.org

Name: Adam Hanson
Position: Sr. Conservation Network Manager
Country: U.S.A
Email: adam@wild.org

RESOLUTION 3

Advancing the Rights of Antarctica

WHEREAS

The 7th World Wilderness Congress (2001) adopted a Resolution, proposed by the late Nobel Peace Prize Laureate Professor Wangari Maathai, stating that delegates should "develop a jurisprudence that recognizes humans as inseparable from the planetary ecosystem."

Delegates at the 10th World Wilderness Congress (2013) resolved to "support the worldwide recognition of the inherent rights of Nature to exist, thrive and evolve," and to "actively advance Nature Rights in law and practice," including through delegates' own work.

Implementation of this approach has continued to accelerate worldwide, and in 2019 the United Nations Secretary General stated that: "Over the last decade, Earth jurisprudence can be seen as the fastest growing legal movement of the twenty-first century." Currently, Nature's rights are recognized in constitutions, treaties, national and municipal legislation, and/or court decisions in at least 24 nations.[1]

The continent of Antarctica and the surrounding Southern Ocean covers ten percent of the surface of Earth, and plays a vital role in maintaining the climate and other conditions which enable life across the planet to flourish. This magnificent, vast wilderness now faces grave threats: climate change is melting the ice and rapidly degrading Antarctic ecosystems on land and in the sea, and increased fishing, tourism, and fossil fuel exploration pose significant and growing risks. Scientists report that Antarctic glaciers are rapidly melting, sea ice is at record lows, ocean currents are weakening, and temperatures of 40°C above average have been recorded.

Antarctica is unique in geopolitical terms: it is not within, or subject to, the sovereignty of, any State. Since 1959, the Antarctic Treaty System (ATS) has reserved Antarctica for peaceful purposes, particularly scientific collaboration, and has prohibited mining and militarization. However the ATS alone cannot meet the intensifying threats to Antarctica, nor enable Antarctica to be represented in decision-making processes that affect it.

In response, a growing number of scientists, indigenous representatives, conservationists, and others are calling for transformative change. This includes the recognition of Antarctica as an autonomous, sovereign, self-regulating entity, for humans to respect and uphold the

inherent rights and freedoms of Antarctica and all Antarctic beings, and for decisions that affect Antarctica to be based on what is best for Antarctica.

THEREFORE

The 12th World Wilderness Congress, reaffirms the support expressed by the 7th and 10th Congresses for advancing the recognition of Nature's rights, and recognizes: first, that Antarctica is a community of inter-dependent Antarctic beings that plays a vital and indispensable role in maintaining conditions conducive to the flourishing of life on Earth; second, that all people have a duty to safeguard the inherent rights and freedoms of Antarctic beings to exist, to be wild and continue their regenerative cycles and processes free of human disruption or control, and to play their unique roles in the larger Earth community.

RESOLVED

A. Delegates at this Congress will support the establishment of a global alliance to advocate for the recognition of the rights of Antarctica and all Antarctic beings, and will advance rights of Antarctica in relevant international fora, current or to be developed, to ensure that those rights are protected and that decisions that affect Antarctica are made in the best interests of Antarctica.

PROPOSER

Name: Cormac Cullinan
Position/title: Executive Director, Wild Law Institute
Country: South Africa
Email: Cormac@greencounsel.co.za

SECONDERS

Name: Andrew Muir
Position/title: CEO, Wilderness Foundation Africa
Country: South Africa
Email: andrew@wfa.africa

Name: Danii Kehler
Position/title: Indigenous Artist & Consultant, Office of the Treaty Commissioner
Country: Canada
Email: daniikehler@gmail.com

Name: Dr Priscilla Wehi
Position/Title: Centre for Sustainability, University of Otago, and Director, Te Pūnaha Matatini National Centre of Research Excellence in Complex Systems
Country: New Zealand
Email: priscilla.wehi@otago.ac.nz

Name: Linda Sheehan
Position/title: Executive Director, Environment Now
Country: U.S.A
Email: lsheehan@environmentnow.org

[1] *See* https://ecojurisprudence.org/ and http://www.harmonywithnatureun.org/rightsOfNature/.

RESOLUTION 4

Mainstreaming Mentorship of Young Ecological Stewards

PREAMBLE:
At CoalitionWILD, we envision a world where young ecological stewards, which includes junior professionals, conservationists, and environmentalists are confident, respectful, respected, included, and well-supported as active leaders and agents of change. Over our ten-year history, we have supported over two hundred young conservation leaders by connecting them with relevant seasoned ecological stewards, helping them amplify their networks, access up-to-date knowledge on conservation sector trends, and gain lifelong supporters and cheerleaders.

In recent years, we have seen a striking increase in interest from young ecological stewards seeking mentorship, receiving more than six hundred applications per year for our Global Mentorship Program. Unfortunately, this surge in interest has not been matched by a corresponding increase in participation from mid and senior generations. This trend is not unique to our program but is also evident in other mentorship programs in the conservation sector with which we have had discussions.

WHEREAS:
To ensure the long-term sustainability of restoration, protection, and conservation of nature efforts, we must invest in the younger generation of ecological stewards. These young ecological stewards will soon enter the workforce, advocate for, and actively engage in movements and policies focused on restoring, protecting, and conserving nature. We recognize that mentorship, understood as: *"a long-term, trust-based, horizontal relationship between two or more people that provides a space for two-way knowledge, ideas, and experience exchange, and reciprocal learning, empowering young people to exercise their agency, fostering their ability to lead and innovate"* is a critical strategy to enhance the effectiveness and maintain the legacy of conservation efforts in the long run.

Mentorship provides youth with cross-generational interactions which contributes to generational planning. This process not only helps maintain the continuity and integrity of the efforts for nature but also secures its legacy.

A key principle of the Kunming-Montreal Global Biodiversity Framework emphasizes the need to "meet the needs of the present without compromising the ability of future generations to meet their own needs." We recognize the importance of engaging in meaningful dialogues with younger generations to understand their needs and equip them with resources to develop

strategies and address those needs. Ensuring the meaningful participation of younger generations in decision-making processes at all levels is possible only when these dialogues are actively promoted.

THEREFORE

The delegates to the 12th World Wilderness Congress, recognizing the importance of youth in addressing our biodiversity and climate crises, are hereby

RESOLVED

A. To include mentorship of younger generations as part of the internal strategy of organizations, institutions, groups, and companies dedicated to protecting, restoring, and conserving nature. Mentorship can be implemented within the organization, with their partner organizations, or externally.

B. To allocate at least 20 hours per year for each staff member of nonprofit organizations, companies, and groups to mentor young ecological stewards; and

C. To ensure each staff member receives at least 10 hours of mentorship training per year to become more effective mentors. These commitments should be reflected in their job description and responsibilities.

D. To encourage retired environmentalists and ecological stewards to contribute their experience, knowledge, and time to mentorship efforts, ensuring that valuable conservation knowledge is passed on to younger generations.

E. To collaborate with organizations or movements that already have successful mentorship programs or are experts in training for effective mentorship relationships.

F. To advocate for funders to increase grant allocations to organizations and groups that incorporate mentorship into their proposals.

PROPOSERS

Name: Rowely “Yen” Parico
Position/Title: Director, CoalitionWILD
Country: Belgium/Philippines
Email: yen@coalitionwild.org

Name: Fátima Gigante
Position/Title: Program Coordinator, CoalitionWILD
Country: Spain/Portugal
Email: fatima@coalitionwild.org

SECONDERS

Name: Michael Grover
Position/Title: Nature Positive Enterprise Manager, Conserve Global
Country: South Africa
Email: Mike.Grover@conserveglobal.org

Name: Crista Valentino
Position/Title: Executive Director, Jackson Hole Travel and Tourism Board Tribal Partnerships Program Manager, National Wildlife Federation Socio-economic Advancement Specialist, Current Consulting
Country: U.S.A
Email: crista.valentino@gmail.com

RESOLUTION 5

Indigenous Law and Guardianship of Nature

WHEREAS
Affirming Indigenous Peoples' inherent relationships with and responsibilities to sacred lands, waters, and sky, and their critical role in protecting and safeguarding Mother Earth and all life within as Nature's traditional guardians since time immemorial; and

Recognizing the shortcomings of anthropocentric legal frameworks, which largely treat Nature or Mother Earth as a mere commodity or resource, and which fail to recognize the unique wants, needs, and voices of life on Earth aside from its value to humans; and

Building on the foundations laid by the 7th World Wilderness Congress (2001), which called for the development of a jurisprudence recognizing humans as inseparable from the planetary ecosystem, and the 10th World Wilderness Congress (2013), which supported the worldwide recognition of the inherent rights of Nature; and

Applauding the growing number of legal guardianship bodies that serve as the human face and voice of Nature, such as Te Pou Tupua, the legal guardianship body for the Whanganui River in Aotearoa New Zealand, along with legal guardianship bodies fulfilling the legal rights of the Atrato River in Colombia, Mar Menor saltwater lagoon in Spain, and Marañón River in Peru (in development), amongst others; and

Noting that Nature's voice is also being elevated in law and society through other innovations, including the establishment of a Mother Earth Ombudsman (Defensoría de la Madre Tierra) in Bolivia and by giving Nature a formal voice in governance, including within government and both for-profit and not-for-profit organizations;

Understanding that humans cannot fully represent the entirety of Nature's diverse interests, yet despite this limitation, it is imperative to strive to provide a voice for more-than-human life in our legal and governance systems; and

THEREFORE
The delegates to the 12th World Wilderness Congress, recognizing the importance of guardianship models and Indigenous law along with other ways to amplify and protect the voice, interests, and rights of Mother Earth, are hereby

RESOLVED

A. To recognize the importance of Indigenous and other guardianship models to provide formal representation for Nature within the legal system.
B. To recognize the importance of amplifying Nature's voice in decision-making within governance mechanisms via human proxy models.
C. To support and honor the rights of Indigenous Peoples to stand as guardians of their territories, recognizing their traditional knowledge and practices as vital to protect and restore Mother Earth.
D. To promote the adoption and implementation of laws and policies that recognize the inherent rights of Nature.
E. To affirm the Inherent Relationships between Indigenous Peoples and their connected lands and waters and other non-rights-based inherent responsibility pathways.
F. To encourage all organizations of which delegates are members to commit to the above.
G. To foster a global movement to amplify Nature's voice within law and society.

PROPOSER

Name: Grant Wilson
Position/title: Earth Law Center
Country: USA
Email: gwilson@earthlaw.org

SECONDER

Name: Britt Gondolfi
Position/title: Rights of Nature Project Coordinator
Country: USA
Email: britt@bioneers.org

RESOLUTION 6

Ratify the High Seas Treaty

WHEREAS

There is no question about the ecological importance that the ocean provides not only for humankind, but for the entire Earth. Historically, the ocean has been falsely viewed as a vast and inexhaustible resource. As with the tragedy of the commons, international waters have facilitated widespread, unregulated ecological exploitation and habitat loss. Despite targets to preserve the ocean, such as the UN's goal to protect 10% of the ocean by 2020, global governments continue to fall short. Nearly halfway through the new decade, only around 8% of our oceans are protected. Meanwhile, the ambitious target of protecting 30% of the ocean by 2030 (30×30) looms just a few years away. Achieving this goal is a critical step toward the broader vision of protecting 50% of the planet by 2030, under the "Nature Needs Half" initiative, which is vital for addressing the dual biodiversity and climate crises as well as protecting the cultural integrity and food sovereignty of Indigenous Peoples.

Conservation priorities can be loosely divided into a two-pronged approach. The first, and most common, strategy is to protect and restore hotspot areas. These are regions of high biodiversity and endemism that face significant human threats. The second approach focuses on proactive wilderness protection, which is a less resource-intensive method aimed at safeguarding ecosystems that are still intact with minimal human disturbances. This dual strategy ensures the preservation of both highly threatened biodiversity hotspots and relatively undisturbed wilderness areas.

While terrestrial wilderness has guided conservation priorities since Dr. Russell Mittermeier defined and mapped it in 1988, marine wilderness has been relatively neglected. It was not until 2018 that Dr. Kendall Jones and his team defined and mapped marine wilderness, identifying areas most devoid of intense human impact. The study revealed that only 13.2% (55 million km^2) of the world's oceans still qualify as marine wilderness, primarily located in the high seas of the polar regions and the southern hemisphere. To date, marine conservation strategies have generally targeted hotspots within Exclusive Economic Zones (EEZs), leaving most marine wilderness unprotected in the high seas and in deep water ecosystems.

Alongside climate change, bottom trawling, and pollution, mining poses an additional threat to deep sea ecosystems, which constitute a major portion of marine wilderness. Over 800 marine scientists have declared that deep sea mining would result, "in the loss of biodiversity and ecosystem functioning that would be irreversible on multi-generational timescales." In addition,

a new study by Sweetman *et al.* (2024) found that "polymetallic nodules" – deep sea minerals that produce a small electric current – are believed to be producing *dark oxygen* in a process called *saltwater electrolysis*. This finding could have major implications in how we understand oxygen production on Earth, and how deep sea mining could further exacerbate climate change and biodiversity loss.

With only 8% of the world's oceans protected, securing Marine Protected Areas (MPAs) has proven to be a complex task involving challenges in politics, funding, and enforcement. A major roadblock for MPA implementation has been the lack of jurisdiction in the high seas, which cover 64% of our oceans. The 1982 UN Convention on the Law of the Sea (UNCLOS) granted the International Seabed Authority (ISA) jurisdiction over the seabed, including areas in the high seas, with a dual mandate to authorize and control mining and protect ecosystems. However, it lacks a framework for establishing MPAs in the high seas and has no mention of the inclusion of the rights of Indigenous People and future generations. In addition, ISA deliberations have favored mining interests over environmental concerns in recent years. The UNCLOS of 1982 is sorely out of date compared to other more recent UN declarations and treaties. It is therefore imperative to have a new vision for the protection of the high seas.

In September 2023, the United Nations signed the High Seas Treaty in potentially one of the largest conservation victories to date. However, for it to enter into force, 60 countries need to ratify it by June 2025. As of August 2024, only 8 countries have ratified while 91 have signed. If ratified, the High Seas Treaty would provide an updated framework that prioritizes marine conservation, including MPA implementation in the high seas, and Indigenous rights.

THEREFORE

Ratifying the High Seas Treaty before June 2025 is essential to achieving the 30×30 conservation target, protecting the entirety of remaining marine wilderness, and combating deep-sea mining prospects. Governments of countries that have signed but not yet ratified the treaty must be urged to act. This treaty would establish the legal framework to incorporate the rights of Indigenous Peoples and traditional knowledge, create MPAs in international waters, and enable a more versatile approach to marine conservation. The High Seas Treaty would play a critical role in safeguarding biodiversity and sustaining large-scale ecological processes in the areas beyond national jurisdiction.

The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED

A. To urge immediate action from all countries to ratify the High Seas Treaty by June 2025.

B. To increase awareness about the High Seas Treaty and to mobilize public support in order to pressure governments to ratify and implement the treaty.

PROPOSERS

Name: Cristina Mittermeier
Position/title: Co-founder, SeaLegacy
Country: Canada
Email: cristina@sealegacy.org

Name: Jamie Goncalves
Position/title: Marine Biologist and Writer, Cristina Mittermeier Photography
Country: Canada
Email: jamie@mitty.art

Name: Hinano Teavai-Murphy
Position/title: Cultural Director, Tetiaroa Society
Country: French Polynesia
Email: hinanomurphy@gmail.com

Name: Frank Murphy
Position/title: Director of Programs, Tetiaroa Society
Country: French Polynesia
Email: fmurphy@tetiaroasociety.org

SECONDERS
Name: Sylvia Earle
Position/title: Founder, Mission Blue
Country: United States
Email: saearle@aol.com or sylviaearle@

Name: Maximiliano Bello
Position/title: Advisor / Global Ocean Policy, Mission Blue
Country: Chile
Email: bello.max.m@gmail.com

Name: Alexandra Cousteau
Position/title: Co-founder, Oceans 2050
Country: United States
Email: alexandra.cousteau@gmail.com

Name: Carlos Duarte
Position/title: Professor and Marine Ecologist, King Abdullah University of Science and Technology (KAUST)
Country: Saudi Arabia
Email: carlos.duarte@kaust.edu.sa

Name: Roderic Mast
Position/title: Founder, Oceanic Society

Country: United States
Email: mast@oceanicsociety.org

Name: Octavio Aburto-Oropeza
Position/title: Professor and Marine Ecologist, Scripps Institution of Oceanography
Country: Mexico
Email: maburto@ucsd.edu

Name: Paul Nicklen
Position/title: Co-founder, SeaLegacy
Country: Canada
Email: paul@sealegacy.org

Name: Christian R. Voolstra
Position/title: President, International Coral Reef Society
Country: Denmark
Email: christian.voolstra@uni-konstanz.de

Name: Mark Erdmann
Position/title: Vice President of Asia-Pacific Marine Programs, Conservation International
Country: New Zealand
Email: mverdmann@gmail.com

Name: Jodie Rummer
Position/title: Professor and Marine Biologist, James Cook University
Country: Australia
Email: jodierummer@gmail.com

Name: Lance Barrett-Lennard
Position/title: Research Scientist, Raincoast Conservation Foundation
Country: Canada
Email: lance@raincoast.org

Name: Titouan Bernicot
Position/title: Founder, Coral Gardeners
Country: French Polynesia
Email: titouan@coralgardeners.org

Name: Daniela Fernandez
Position/title: Founder and CEO, Sustainable Ocean Alliance
Country: United States
Email: daniela@soalliance.org

Name: Mikki McComb-Kobza

Position/title: Founding Director, Ocean First Institute
Country: United States
Email: mikki@oceanfirstinstitute.org

Name: Adam Hanson
Position: Sr. Conservation Network Manager
Country: U.S.A
Email: adam@wild.org

RESOLUTION 7

Making Space to Protect White Animals, Messengers of Peace

PREAMBLE

White buffalo are exceedingly rare. Distinct from albino buffalo (with red eyes and pink noses, versus white buffalo which possess black eyes, nose, and hooves), only 1 in 10 to 20 million buffalo are born white. These unique individuals also play an important role in the prophecies of the Lakota, Dakota, and Nakota Oyate.

This resolution is requested by Chief Arvol Looking Horse, the 19th Keeper of the Sacred White Buffalo Calf Pipe, and was catalyzed by the birth of a true white buffalo in Yellowstone National Park in June of 2024, two months prior to the 12th World Wilderness Congress. Lakota prophecy holds that the white buffalo calf will be born in difficult times of cataclysmic change. It portends the end of a cycle, and draws attention to the need for the restoration of balance and peace.

In 2023, Chief Looking Horse also had a vision, in which the world would gather in the Black Hills, people from all walks of life, who would work to heal Ocim Maka, Mother Earth. His vision coinciding with the birth of the white buffalo calf and the 12th World Wilderness Congress, is the impetus behind this resolution. While this may challenge those delegates steeped in more material epistemologies, those who seek to create transformational change believe traditional ways of knowing play an important role in the world we seek to create.

WHEREAS

White animals play an irreplaceable role in the cultural practices of traditional peoples. These animals, which are often viewed as “messengers of peace” help to restore pride and relevancy in ancient lifeways while simultaneously heightening interest in traditional ways of knowing. In many cultures, when people learn of the birth or appearance of a white animal, such as the recent birth of the exceedingly rare white buffalo in Yellowstone National Park, they are reminded of the prophecies of their ancestors and are often inspired to come closer to the practices through which such prophecies were derived. Thus, white animals can play a role in slowing assimilation’s corrosive poison of forgetfulness.

The sudden, unexpected appearance of a white animal - within a community's awareness or an individual's line of sight - fills many with a sense of hope and a connection to a purer, more expansive, and more subtle reality, be that the intangible principles of goodness and peace or a stronger recognition of the collective unconscious and the Otherworld. They guide the

attention of native and non-native peoples alike toward the sacred and a recognition that existence is more than just physical bodies moving through physical space. They remind us of the omnipresence of spirit. They remind us that Earth is sacred.

White animals have a track record of uniting us, across cultures, in worthwhile endeavors. It was the protection of the Southern White Rhino, which in the 1950s was on the brink of extinction, that brought the founders of the World Wilderness Congress together (a white South African game ranger and his Zulu mentor) during the violent racism of Apartheid to unify their efforts for the protection of this species. It is the June 2024 birth of the white buffalo in Yellowstone that precedes the cross-cultural communion of the 12th World Wilderness Congress (WILD12) that will convene in the *Hé Sapa*, the Black Hills, in August of the same year.

Like all lifeforms, white animals need a space to live, grow, and nourish themselves. While their appearance is oftentimes rare, these appearances will become even more scarce if we continue to degrade the lands, waters, and seas upon which they depend. This weakens our connection to the sacred. When we make space for life, we make space for white animals. When we make space for white animals, we make space for the sacred. In the view of many Indigenous Peoples, the logic is self-evident.

Recent governmental calls to protect 30% of Earth's lands, waters, and seas by 2030 (30x30), while important, do not go far enough for Indigenous Peoples who view all of Earth as sacred and who recognize that intact places that many call "wild" help to increase the likelihood that we might encounter and be inspired by white animals and that they might aid us in drawing closer to Spirit. Western scientists have called to protect a minimum of Half of Earth's lands, waters, and seas – while this is still not enough (all of Earth is sacred, not just Half), it is a step closer to what is needed.

THEREFORE

Due to the fact that Western science and conservation does not fully recognize or understand white animals for what they are, Indigenous leadership and stewardship of the lands, waters, and seas must play a prominent role in the global endeavor to ensure that nature has sufficient space to thrive. The 30x30/Half objective must include the restoration of Indigenous territories to Indigenous Peoples who will unite Western science and traditional knowledge and wisdom to protect the physical spaces that help manifest white animals into the world and who will in turn heighten the sacred significance of our lives.

RESOLVED

A. Call upon conservation non-governmental organizations, national and provincial land management agencies, and Indigenous leaders to publicly recognize the sacredness of all of Earth, including and especially white animals.

B. Increase awareness about the role of white animals in reminding us of the importance of and our connection to intangible and spiritual dimensions.

C. Increase the amount of lands, waters, and seas that are wild, healthy, and intact to at least Half of the surface of the Earth, and in doing so requiring the free, prior, and informed consent of all Indigenous Peoples and local communities who occupy those areas, and including in this objective the return and restoration of territory to Indigenous communities for the purpose of stewarding Earth in accordance with traditional knowledge and wisdom.

D. Encourage further public dialogue on the sacred and the role white animals play as messengers of peace.

PROPOSERS

Name: Chief Arvol Looking Horse
Title: 19th Keeper of the Sacred White Buffalo Calf Pipe
Country: *Hé Sapa*
Email: upon request

Name: Philimon Two Eagle
Title: Executive Director, Sicangu Lakota Treaty Council
Country: *Hé Sapa*
Email: phil.twoeagle@rst-nsn.gov

SECONDER

Name: Amy Lewis
Title: CEO/WILD.org
Country: USA
Email: amy@wild.org

RESOLUTION 8

Empowering Ecological Outcomes by Honoring Treaties

WHEREAS

Many Indigenous Peoples, including the Oceti Sakowin Oyate, have signed treaties with national governments. In all such cases, Indigenous Peoples, like national governments, are possessed of inherent sovereignty and may enter into such agreements in good faith. In the case of the Oceti Sakowin Oyate, these treaties were signed in 1851 and 1868 at Fort Laramie, and recognize a combined territory of approximately 60 million acres that include the better part of South Dakota, and parts of North Dakota, Montana, Wyoming, and Nebraska for the "free and undisturbed use" of the "Great Sioux Nation." Few, if any of these treaties, have ever been fully implemented, despite recognition of their legal standing by national courts, including the Supreme Court of the United States.

National governments continue to dishonor themselves and the treaties with devastating consequences for both Indigenous Peoples and the environment. Currently, the Oceti Sakowin Oyate occupy less than 2 million acres of land while federal authorities continue to approve and support uses and interactions that further degrade treaty lands. For example, in 2016, the United States Army Corps of Engineers approved the Dakota Access Pipeline (DAPL) on treaty lands taken from the Standing Rock Tribe in 1958. This pipeline runs beneath Lake Oahe and the Missouri and Mississippi Rivers, which are sacred rivers that millions of people (not just the Oceti Sakowin) depend upon.

Since the Mining Act of 1872 which allowed miners to purchase claims on sovereign treaty lands, mines (first for gold and now for uranium, lithium, and rare earth), were the first major infrastructure in violation of the treaties with the United States federal government. Abandoned gold mines continue to pollute the waters and sit atop sacred places, while new mines jeopardize water quality and availability in an area that is dry and subject to increasing drought conditions as we confront the twin ecological crises of climate change and biodiversity loss.

Meanwhile, federal, national, and provincial authorities work hand-in-hand with tribal authorities devised and imposed by colonial powers on Indigenous Nations (in the case of the Oceti Sakowin Oyate this occurred through acts of Congress in 1889 and 1934) which permit and grant approval of activities that further destroy the land, including oil and natural gas drilling. Traditional authorities, the treaty councils, and those who seek to restore and

interpret traditional lifeways in this new era, disagree with these decisions and view them as a consequence of ongoing treaty violations.

Indigenous Peoples, including the Oceti Sakowin Oyate, since time immemorial have been distinct Peoples possessed of inherent sovereignty. These Nations and communities share common ancestry and their own societies, spiritualities, languages and dialects, lifeways, culture and traditions, knowledge, science and technology, economy, history, territory, laws and norms, governance, leaders, warriors, and the capacity to enter into relations with other nations. For the Oceti Sakowin Oyate, our traditional form of government is a decentralized confederation among seven bands that include both appointed and hereditary positions of authority who maintain our customary laws of Wakȟáŋ Tȟáŋka, wólakȟota, and the čhaŋnúŋpa. Our lifeways also contain institutions and knowledge forgotten by the dominant, colonial culture that makes Indigenous Peoples more effective stewards of the environment when empowered to steward our treaty lands and practice our traditional practices.

THEREFORE
Western scientists have called to keep half of Earth's lands, waters, and seas intact in order to preserve the ecological functionality of the biosphere and slow or halt the climate crises.

Political leaders have proposed protecting 30% of Earth's surface by 2030 (30x30). Restoring treaty lands, waters, and seas to Indigenous Peoples and traditional cultures interrupts the extractive and destructive misuse of these areas by national authorities and the resulting severe ecological consequences. It also honors the agreements these governments entered into with the leaders of other sovereign nations.

RESOLVED

A. Require the full respect and enforcement of all treaties with Indigenous Peoples according to the laws of Indigenous Peoples and the international law of treaties between nations as equals. Require that matters and disputes between Indigenous Peoples and national governments, and other nations and states, be resolved by treaties as between nations as equals.
B. Restore and respect the primacy of the traditional and customary laws of Indigenous Nations and communities in the constitutions and courts of national authorities.
C. Recognize that achieving the Half/30x30 target must include the restoration of treaty lands to the customary governance and stewardship by Indigenous Peoples.
D. Restore the traditional customary governance of Indigenous Peoples.
E. Restore the traditional customary selection of governance officials by Indigenous Peoples.
F. Cease the colonial rule of treaty lands, including the so-called doctrines of discovery, trust authority, and plenary power.
G. Implementation by Indigenous Nations of inherent sovereign authority including but not limited to any and all use or development of its lands, water, minerals, and airspace and the conduct of persons, corporations, and any other entity occurring within its territory.

H. Require the return of all territory and lands, including but not limited to sacred Pahá sites, unceded lands, and all territory and lands taken through allotment.
I. Require full reparations for all harms of any kind or nature, including but not limited to the ecology, suffered by Indigenous Peoples.

PROPOSERS

Name: Philimon Two Eagle
Title: Executive Director, Sicangu Lakota Treaty Council
Country: Hé Sapa
Email: phil.twoeagle@rst-nsn.gov

Name: Claude Two Elk
Title: Chairman, Sicangu Lakota Treaty Council
Country: Hé Sapa
Email: tokala2elk@gmail.com

Name: Ilarion Merculieff
Title: Founder, Global Center for Indigenous Leadership & LIfeways
Country: U.S.A.
Email: lmerculieff@gmail.com

Name: Shay Sloan Clarke
Title: Executive Director, Global Center for Indigenous Leadership & LIfeways
Country: U.S.A.
Email: director@gcill.world

SECONDER

Name: Amy Lewis
Title: CEO/WILD.org
Country: U.S.A.
Email: amy@wild.org

RESOLUTION 9

Urgent Mineral Withdrawal for all of the Black Hills

PREAMBLE:
We, the delegates of the 12th World Wilderness Congress convened in the sacred lands of the Black Hills, recognize these lands belong to the Lakota. The Black Hills are unceded Lakota territory guaranteed for their "absolute and undisturbed use and occupation" by the Treaties of Ft. Laramie 1851 and 1868. Treaties are the supreme law of the land according to Article VI of the US Constitution. It must be said the Lakota have inherent sovereignty to their land that pre-dates the treaties.

However, these lands, and the meanings attached to these lands by the Lakota, are under threat from mining activities, which pose irreversible damage to the environment and violate the treaties that protect these lands. The Lakota have called for an end to mining in the Black Hills, 80% of which are considered Federal lands, and the Lakota are leveraging the administrative mechanism of a Mineral Withdrawal. A Mineral Withdrawal is a process of the United States Forest Service which removes a specific area from mineral entry, meaning no new mining claims will be issued. This is effectively a 20-year mining ban. There is currently an ongoing proposed Mineral Withdrawal in the Black Hills for parts of the Pactola Reservoir and Rapid Creek. The Black Hills Sioux Nation Council, the Sicangu Lakota Oyate Treaty Council, the Oglala Sioux Tribe, the Rosebud Sioux Tribe, and the Lower Brule Sioux Tribe, have all passed resolutions or signed letters supporting the Mineral Withdrawal at Pactola, asking for the expansion of the Mineral Withdrawal, and for a Mineral Withdrawal of ***all*** the Black Hills. We will follow the lead of the Lakota people and support the current proposed Mineral Withdrawal at Pactola, see it expanded to all of the Pactola Reservoir and Rapid Creek Watershed, and lastly call for a new Mineral Withdrawal for the entirety of the Black Hills. We will do this by sending this resolution to the USFS and the Bureau of Land Management, and will write a letter that all members and attendees of WILD 12 can send out from their individual organizations.

WHEREAS:

The Black Hills belong to the Lakota; and Treaties are the supreme law of the land, and the treaties of Fort Laramie (1851 and 1868) legally recognize the rights of the Lakota Nation to the Black Hills, affirming the land is "set apart for the absolute and undisturbed use and occupation" by the Lakota; the Lakota have inherent sovereignty to the law under Natural Law; and

The Lakota have always fought against mining and the destruction of their sacred land; and

The Black Hills Sioux Nation Council, the Sicangu Lakota Oyate Treaty Council, the Oglala Sioux Tribe, the Rosebud Sioux Tribe, and the Lower Brule Sioux Tribe, have all passed resolutions or signed letters supporting the Mineral Withdrawal at Pactola, asking for the expansion of the Mineral Withdrawal to all of the Pactola Reservoir and Rapid Creek Watershed, and for a Mineral Withdrawal of the Black Hills,

THEREFORE:
The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED:

A. To follow the lead of the Lakota by supporting the Mineral Withdrawal at Pactola, and ask for it to be expanded to all of the Pactola Reservoir and Rapid Creek Watershed;

B. To call for a Mineral Withdrawal for ***all*** of the Black Hills;

C. That civil society will follow up by communicating our support by using the correct processes and channels to the Federal Governmental agencies, and will provide template letters of support to all of our attendees and members aiding in this effort;

D. To urge all levels of government, including the United States federal government, to honor their treaty obligations, uphold the sovereignty of the Lakota Nation, and collaborate with Indigenous communities ensuring that the Black Hills remain free from the pervasive and destructive impacts of mining for future generations.

PROPOSERS:
Name: Beatriz Padilla Martínez
Title: President, Fundación Biosfera del Anáhuac, A.C.
Country: Mexico
Email: bea.padilla@funba.org

Name: Alan Watson
Title: Social Scientist and Member of IUCN WCPA Wilderness Specialist Group
Country: Missoula, Montana
Email: wildmule.watson@gmail.com

Name: Bill Masure
Title: Content Producer, Wildlife Protection Solutions
Country: USA (Denver, Colorado)
Email: bill.masure@gmail.com

SECONDERS:

Name: Ernesto Enkerlin
Country: Mexico
Email: enkerlin@gmail.com

Name: Michael Charton
Country: England
Email: michaelcharton@inheritsouthafrica.com

Name: Patricia Rojo Blanco
Country: México
Email: patriciarojo@gmail.com

RESOLUTION 10

Recognition of Central Mexico's Forest of Water as a Strategic Region for the Viability of Central Mexico's Megalopolis

PREAMBLE

We, the delegates of the 12th World Wilderness Congress convened in the sacred lands of the Black Hills, clearly see that the highly biodiverse and rapidly degrading Forest of Water of Central Mexico is the largest benefactor of the country's most densely populated region, providing water and vital ecological services to a growing number of over 25 million people, today nearly a fifth of Mexico's total human population, in the region where 30% of the gross domestic product is generated. We further see that its loss would not only put at risk the social, political and economic viability of Mexico as a country, but that its effects would also ripple across borders. The Forest of Water is a world-wide example of how very large wild, natural areas are able to provide ecological services to people, water being the most obvious of them all.

WHEREAS:

The Forest of Water harbors over 2% of the world's flora and fauna, Mexico's highest number of endemisms and 10% of Mexico's flora and fauna species; and of the region's biotic diversity, 10% of its species are endemic: a total of 325 species found nowhere else on Earth; and although the Forest of Water represents only 0.065% of the national territory, it harbors an important proportion of Mexico's biodiversity (5 of its 6 Ecological Zones, 8 of its 10 types of ecosystems, 13% of its plant species, 17% of its fungi species, 20% of its invertebrate species and 15% of all the vertebrate species known in Mexico); and the Forest of Water is also the provider of water to three RAMSAR SITES (Hueyapan lagoon, Xochimilco and the Ciénegas de Lerma); and hundreds of migratory bird species hibernate in the Forest of Water.

Close to 80% of the water consumed in Mexico City comes from the Forest of Water; and in 2024 the metropolitan area of the Mexico City valley experienced dramatic water scarcity during the dry season, followed by a high record of urban floods when the rains settled in.

Urban sprawl from the valleys of Mexico, Toluca and Cuernavaca is rapidly climbing up the slopes of the Forest of Water mountains; and very powerful real estate corporations are making exclusive residential areas in protected and or very well-conserved stretches of the Forest of Water, such as the residential projects of Reserva Santa Fe, Bosque Real, Villa Alpina and Bosque Diamante.

New roads and highways are planned for this region that is already fragmented by over 90 paved roads, some of them being highways whose construction violently transgressed the rights of local native communities. Illegal logging and soil extraction are degrading the Forest of Water at an unprecedented and highly alarming rate. Numerous new stressors associated with and induced by climate change such as the increase in fire frequency and intensity and additional susceptibility and decline of forest resilience in vast swaths of the Forest of Water, and the Forest of Water lacks a proper land-use plan with a regional and watershed perspective.

THEREFORE:

The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED:

A. To call for the recognition and management of Central Mexico's Forest of Water as a region that is strategic to the viability of Central Mexico's Megalopolis, as well as for the recognition of its indigenous and agrarian communities -ancestral inhabitants of the territory- as its true and essential custodians;
B. To call on the governments of the states of Morelos, Mexico and of Mexico City to sign a Collaboration Agreement for the conservation of the Forest of Water, to implement the *Strategy for the Conservation of the Forest of Water 2012-2030*, and to renew it with a 2025-2050 Action Plan to be developed in very close collaboration with with people from the Forest of Water communities, the academic sector and NGOs, all with a proven track-record of defending the forest;
C. To urge all levels of government to immediately stop the proliferation of industrial and residential developments and highways on the slopes and highlands of the Forest of Water;
D. To call all new federal and state congresses to legislate towards landscape connectivity (of natural protected areas with all other biodiversity conservation areas) to preserve biological and hydrological corridors, for the conservation of ecosystems and of their environmental benefits;
E. To urge all levels of government to immediately safeguard that the mountains themselves and their wildlife are hydrated, by not exporting all the water from its springs to the towns and cities, but leaving some to hydrate the ecosystems and their species;
F. To call upon all levels of government to immediately carry out a participatory process to develop a regional land-use plan for the entirety of the Forest of Water, to respect the rights of indigenous communities to define the destiny of their territories, to support communities in the development and implementation of their local land-use plans, and to strictly respect these plans;
G. To urge the Ministry of the Defense and the National Guard to design and carry out a plan to oust all organized crime activities including illegal logging and other illegal activities such as soil extraction, land-use change and arson forest fires;

H. To call upon all levels of government to immediately carry out ecological restoration programs throughout the Forest of Water, generating employment for people from the local indigenous and agrarian communities in all conservation and restoration activities, and in the management of all protected areas in the region.

PROPOSERS:

Name: Beatriz Padilla Martínez
Title: President, Fundación Biosfera del Anáhuac, A.C.
Country: Mexico
Email: bea@funba.org

Name: Ulrich Stoecker
Title: Deutsche Umwelthilfe (Environmental Action Germany)
Country: Germany
Email: stoecker@duh.de

SECONDERS:

Name: Dr. Arthur Zimiga
Title: President, WiZi Tecnology
Email: Zimiga@aol.com

Name: Ernesto Enkerlin
Country: Mexico
Email: enkerlin@gmail.com

Name: Francesca Mahoney
Title: Founder & Executive Director, Wild Survivors
Country: London and Tanzania
Email: francesca@wildsurvivors.org

Name: Bob Baron
Title: Founder, Fulcrum Publishing
Country: USA (Lakewood, Colorado)
Email: bob@fulcrumbooks.com

Name: Charlotte Baron
Title: Director, the WILD Foundation
Country: USA (Lakewood, Colorado)
Email: charlotte@fulcrumbooks.com

Name: Maya Roberts
Title: Marketing Associate, Fulcrum Publishing
Country: USA (Minneapolis, Minnesota)
Email: maya@fulcrumbooks.com

Name: Patty Maher
Title: Production Manager and Film Production Manager, Fulcrum Publishing
Country: USA (Lakewood, Colorado)
Email: patty@fulcrumbooks.com

Name: Boyd Norton
Title: Conservation Photographer
Country: USA (Evergreen, Colorado)
Email: boydn@earthlink.net

Email: Barbara Norton
Title: Chemist and Librarian
Country: USA (Evergreen, Colorado)
Email: bnorton105@gmail.com

Resolution 11

Metaphysical Activism

WHEREAS:

1. Humanity is being called upon to take transformative, epic action to respond meaningfully to a multitude of converging (some, potentially existential) crises, including war among humans, and war perpetrated against the biosphere.

2. Conventional activism has had undeniable value in progressively helping to mitigate or resolve said crises. Yet those crisis situations continue to worsen in nature and degree, *indicating the urgent need for a radically different approach*.[1]

3. From the perspective of many [Indigenous Peoples], and a growing number of awakening and awakened non-[Indigenous] populations, these predicaments are seen as largely symptomatic of a fundamental underlying crisis, i.e. a crisis of **consciousness**, or of the **spirit** of a critical mass of humanity (which for the purposes of this resolution We shall call a [**metaphysical] crisis**) - both in terms of the cause, and people's capacity to respond to remediate the situation.

4. Arguably, that [metaphysical] crisis is characterized by people's:

    a. diminished connection with the Planet, and all Earthly relatives (whether human, or other) – including Our responsibilities to co-exist, to the best of Our capacity, in harmony with them, and

    b. lack of awareness and understanding about:

        i. the **true nature of reality**, i.e. that it is fundamentally **[*metaphysical]*** (consciousness, energy or spirit-based[2]) as opposed to malleable, molecular-based, **physical reality**, and

        ii. their essential, Highest Sovereign,[3] [metaphysical] Self, and (as such) their potent, inherent power to generate from the [metaphysical] into physical reality, and

5. This [metaphysical] crisis demands a corresponding new kind of [**metaphysical] activism** to address it.

THEREFORE:

1. A **mechanism** is **urgently required** to generate a quantum leap in awareness of the circumstance outlined in 1-5 above, that is focused on (1) exploring, comparing and contrasting different [**metaphysical**] perspectives, with the intent to (2) actively identify shared objectives and effective [metaphysical]-based action in the context of healing and resolving the aforementioned converging crises.

    a. In the spirit of **optimizing receptivity** across a diverse range of audiences, the mechanism shall be grounded in a **collaborative, cross-knowledge system approach** comprising a triangulation of (a) [Indigenous] ancestral technical knowledge,[4] (b) Western science, (c) spiritual wisdom and (d) faith-based wisdom. This is essential to optimize the mechanism's inclusivity, so that a diverse range of people feel safe to engage with the mechanism, in so far as they find one or more of above mentioned perspectives (a)-(d) relatable, regardless of their ethnic cultural, spiritual, religious, academic, social, political or other beliefs or orientations.

RESOLVED:

1. That a publicly transparent [**metaphysical] activism mechanism** be urgently established to bring together [Indigenous] ancestral technical knowledge, Western science, spiritual and faith- based wisdom perspectives, with the intention, through constructive dialogue, to:
    a. achieve a deeper understanding of the nature of reality (including [metaphysical] and physical realities), and humanity's power within that construct to shape reality, and in doing so

    b. explore transformative practices, based in [metaphysical] knowledge and wisdom, by which to remediate the many converging crises facing humanity – and beyond, to co-create a more harmonious world, and

    c. actively promote awareness, education and appreciation of the value of [metaphysical] activism in this context.

PROPOSERS:

Name: Catherine Murupaenga-Ikenn
Title: [Indigenous] Human Rights and environmental defender and United Nations Office of the High Commissioner for Human Rights (2005 Indigenous Fellow, and 2020-21 Senior Indigenous Fellow)
Country: Aotearoa, New Zealand
Email: catherinedavis@hotmail.co.nz

Name: George Pletnikoff
Title: Elder, Global Center for Indigenous Leadership and Lifeways/ GCILL, Alaska Oceans Campaigner
Country: Unangan, St. George Island, Alaska
Email: gpletnikoff@gmail.com

SECONDER:
Name: Anita Sanchez
Title: Elder, Global Center for Indigenous Leadership and Lifeways/ GCILL
Country: Nahua (Aztec) and Mexican American
Email: anita@sancheztennis.com

[1] In the spirit also of Einstein's idea that a problem cannot be fixed with the same consciousness that created
it.
[2] Science might describe this foundational reality as being based in the quantum field.
[3] We are mindful that this is a term from the colonizer's language. It is used here as a generic substitute for any term which First Nations Peoples may prefer to use from their own respective language. "Self-determination" may be another such substitute term.
[4] Also known as Native Science, which was discussed by Dr. Greg Cajete, WILD12 Plenary, Day 1.

RESOLUTION 12

Protecting the Sámi Forest: Safeguarding Biodiversity and Indigenous Livelihoods

WHEREAS:

The Boreal Forest is a complex and incredibly valuable ecosystem that supports a wide range of life forms. Covering 68% of Sweden's land area, and encompassing four countries, it is one of the earth's most extensive forested regions. The Boreal Forest is the world's second largest above ground carbon sink, containing 22% of the carbon stored on Earth's land surface. Thus, the conservation of Sápmi is essential for its ability to mitigate the impacts of climate change.

The Boreal Forest is also a vital habitat for a unique ecosystem. It is home to the Arctic reindeer, a keystone species crucial for the ecological health of the entire region. The forest also supports an estimated 1,600 species of lichen, which are highly sensitive to ecological changes (once degraded, some species regrow as slowly as 1 millimeter per year); these lichen are also an indispensable, and increasingly rare, food source for the Arctic reindeer.

Sápmi, the homeland of the Sámi people, is a vast land mass where the Boreal Forest covers 62% of the land. The Sámi culture is deeply intertwined with the survival and health of the reindeer, as Sámi food, clothing, language, handicrafts, and tradition all depend on their existence. The decline of the forest, and thus the reindeer population, poses a serious threat to the Sámi way of life.

Despite its ecological significance, Sweden's old-growth boreal forests are being lost at an alarming rate of 1.4% per year (70% over the last 60 years), a rate higher than the Amazon rainforest. Between 2003 and 2019, nearly a quarter of Sweden's remaining old-growth forests were lost. This rate of deforestation poses a significant threat to the ecosystem's integrity and the sustainability of its carbon sequestration, biodiversity conservation, and resilience to threats posed by climate change. Rapid rates of clear cutting and forest degradation also place the Sámi way of life at significant risk, as the decline in lichen-abundant forest land threatens the food security of reindeer populations, which are crucial to the Sámi culture and traditional subsistence living.

THEREFORE:

To ensure the long-term sustainability of the Boreal Forest, and to maintain the ecological and cultural integrity of the forest in Sámi lands, it is imperative to adopt practices and conservation efforts that prioritize the protection of Sápmi and elevate Sámi voices.

Recognizing the Sámi people's traditional knowledge and practices is crucial for sustainable forest management, as the reindeer herding practices of the Sámi people have historically contributed to the health and resilience of the Boreal Forest,

The delegates to the 12th World Wilderness Congress (WILD12), convening in He Sapa, the Black Hills of the Oceti Sakowin Oyate are hereby

RESOLVED:

A. To mobilize public support and influence legislation to ban clear-cutting of forests, protecting the ecological integrity of ecosystems in Sápmi.
B. To call upon the public and all countries to support sustainable forestry practices that maintain the ecological integrity of the Boreal Forests in Sápmi to develop and implement strategies to ensure the protection of reindeer habitats, lichen growth, and the survival of Sámi cultural practices.
C. To work directly with Sámi communities in restoring degraded forests in ways that protect reindeer habitats and promote lichen growth, shifting from consumption-based replanting to long-term restoration of habitat.
D. To advocate for public dialogue and education to teach younger generations to respect and integrate Sámi traditional knowledge and practices.
E. To ensure that the right to Free, Prior, and Informed Consent (FPIC) is upheld by all relevant actors and that Sámi communities are actively involved in local and global conservation efforts.
F. To advocate for monetary support to affected communities to meet the needs for the restoration of lichen-abundant forests and other vital habitats, supporting the food security of reindeer populations as well as the cultural integrity and economic well-being of the Sámi people.

PROPOSERS

Name: Maidi Eira Andersson
Title: Reindeer Herder
Country: Sweden
Email: maidikristin@hotmail.com

Name: Tori Pfaeffle
Title: Program & Administrative Associate, WILD.org
Country: USA
Email: tori@wild.org

Name: Madison Miller
Title: Development & Administrative Associate, WILD.org
Country: USA
Email: madison@wild.org

SECONDERS

Name: Amy Lewis
Title: CEO, WILD.org
Country: USA
Email: amy@wild.org

Name: Jackie Batrus
Title: Senior Communications Officer, WILD.org
Country: USA/Swiss
Email: jackie@wild.org

Name: Giulia Gasparrini
Title: Content Lead, WILD.org
Country: Monaco
Email: giulia@wild.org

Name: Yen Parico
Title: Director, CoalitionWILD
Country: Belgium/Philippines
Email: yen@coalitionwild.org


Wild 12