

Tribal co-stewardship in practice: Emerging reflections from the field

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Abstract

Forest and wildfire management in the 21st century requires working across jurisdictional boundaries and with various land management entities. One important group includes Native American tribes, sovereign nations with unique legal and political standings who possess deeply rooted, intergenerational knowledge of ecological processes and landscape dynamics. This research seeks to learn from and engage with existing landscape-scale efforts where tribes are leading the way in cross-boundary ecosystem collaboration. In this paper, we synthesize recent field experiences and identify emergent themes from two in-person engagements related to interorganizational dialogue and tribal co-stewardship, one in Colorado (2024) and the other in New Mexico (2025). From these gatherings, we found that a range of definitions exist for co-stewardship, and that shared lessons around *Knowledge*, *Power*, *Practice*, and *Presence* – “KP3” – can inform future intertribal collaborations focused on cross-boundary natural resource management. *Knowledge* includes developing a shared understanding of various terms and recognizes that tribes and non-tribal entities often have different perceptions of the land, as well as how management is implemented and for what benefits. *Power* references the two-fold problem of capacity, recognizing that sovereign-to-sovereign relationships take immense time, energy, and sustained commitment on both sides. *Practice* acknowledges systematic ‘growing pains’ and emerging legal, bureaucratic, and logistical challenges bound up with shifting agency priorities and the legacies of settler colonialism. Lastly, *Presence* refers to the long-standing stewardship of tribal nations and the positive work going on throughout Indian Country. By exploring themes that emerged from these two in-person engagements, this article aims to share the lessons of KP3 to inform and strengthen future landscape scale collaborations between federal agencies and Indigenous communities.

Introduction

Over the past several decades, Native American tribes have continued to assert their sovereignty and have played a pivotal role in restoring ecosystems and socio-cultural practices around culturally significant species and landscapes. Recent federal initiatives have strengthened tribal engagement and emphasized federal trust responsibilities, prioritizing the inclusion of Indigenous Traditional Ecological

Knowledge (ITEK)¹ within agency decision-making and co-stewardship of lands and resources (Donoghue et al., 2010; Hoagland, 2017; Murray, 2023). Although significant efforts have been made – including the signing of over 120 co-stewardship agreements by the USDA² Forest Service (USFS) in 2023³ – such efforts are still in development, with few cross-cutting analyses to date.

[1] ITEK, or Indigenous Traditional Ecological Knowledge, is one of several terms used to refer to the collective body of knowledge, beliefs, and practices adaptively evolved over generations to promote responsible stewardship and healthy relationships between human beings and their environment.

[2] U.S. Department of Agriculture.

[3] USFS Office of Tribal Relations personal communication; 2024 White House Tribal Nations Summit; USDA Annual Report on Tribal Co-Stewardship <https://www.usda.gov/sites/default/files/documents/co-stewardship-authorities-november-508.pdf>

This research, begun in 2023, attempts to engage this gap, to better understand the challenges and opportunities of co-stewardship. Here we report preliminary findings from two in-person gatherings that included both USFS and tribal collaborators: the first, a workshop of scientists, managers, and tribal members held in Colorado in 2024, and the second, an intertribal gathering held in New Mexico in early 2025. Through these engagements, explored by a subset of our co-authors through participant observation and subsequent team-based reflection, we identify challenges faced and lessons learned by tribal communities and allies – those who have been carrying out the hard work of on-the-ground environmental collaboration, sometimes over decades – with the aim of informing future research and management efforts around tribal co-stewardship.

Background

The federal government owns and manages almost half (47%) of the land area in the 11 contiguous western states,⁴ with the majority governed by the Bureau of Land Management (BLM, part of the Department of the Interior; 247.3 million acres) and the USFS (192.9 million acres) (Bui & Sanger-Katz, 2016; Ruple, 2020). However, these ‘public’ lands only came to be through a history of private and federal interventions – including the dispossession and genocide of Indigenous peoples (White, 1983; Banner, 2005; Wolfe, 2006; Saunt, 2020; Farrell et al., 2021; Martin, 2024). As Mills and Nie explain, “But for the removal and exclusion of tribes from large swaths of their traditional territories, there would be no public lands... Both physically and legally, Indian tribes have been removed from the landscapes they occupied since time immemorial” (2021, 54).

In 1968, the American Indian Movement (AIM) was founded, followed by then-President Richard Nixon’s Special Message to the Congress on Indian Affairs in 1970, expressly rejecting the U.S. government’s prior policy of removal and forced termination of trust obligations in favor of tribally defined priorities, inherent tribal sovereignty, and government-to-government relationships – beginning an era of “self-determination” in Indian affairs (Nixon, 1970; Mills & Nie, 2021; Stark et al.,

2022). However, there remained a disconnect between public lands management and Indian law: although agencies like the USFS have “considerable discretion” in their land management decision-making according to Mills and Nie, agencies “regularly disassociate their land management activities from their interactions with tribes,” with the latter too often viewed as “an additional burden or only ancillary to their mission” (2021, 54). Consequently, while environmental restoration activities and federal decision-making have broad implications for tribal objectives and values, agency goals do not always take these into account. Uneven power dynamics, differences in perspectives or expectations, and a lack of resources have also frequently exacerbated tensions within federal-tribal partnerships, representing areas that might benefit from more intentional tribal consultation in higher-level decision-making and resource management (Dockry, 2018; Smith, 2023).

More than 50 years after Nixon’s message, we are only now entering a period of rethinking and engagement around public land law vis-à-vis treaty and trust responsibilities. Under the Biden administration, new obligations were communicated to federal agencies, including Joint Secretarial Order 3403, “Fulfilling the Trust Responsibility to Indian Tribes in the Stewardship of Federal Lands and Waters,” as well as memoranda on “Indigenous Traditional Ecological Knowledge and Federal Decision Making” (2021), “Guidance for Federal Departments and Agencies on Indigenous Knowledge” (2022), and “Implementation of Guidance for Federal Departments and Agencies on Indigenous Knowledge” (2022). Within the USFS, this took form through the Office of Tribal Relations Action Plan, “Strengthening Tribal Consultations and Nation-to-Nation Relationships” (FS-1211, 2023).

Crucially, Indigenous peoples themselves have, in large part, pushed these discussions and policy shifts forward, over generations of contestation and through social movements for self-determination like AIM. Arguably, recent federal moves around collaboration would not have occurred without the mobilizations, discourse, and successes of Indigenous-led efforts – including the Dakota

[4] Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Access Pipeline protests (#NoDAPL) and movements around #LandBack – a context largely absent from, yet implicit in, contemporary discussions of co-stewardship and co-management (Pieratos et al., 2021; Stark et al., 2022, 445; Racehorse & Hohag, 2023).

Today, research linking new initiatives to historical experiences and existing collaborations is limited, with various challenges preventing strategic alignment between tribes and federal agencies. The intent of this research project is to leverage available resources to speak to the needs identified by tribal collaborators while addressing contemporary knowledge gaps. We aim to learn from and engage with existing landscape-scale efforts across the western U.S., where tribes have led the way in cross-boundary ecosystem restoration.

We are cognizant that doing this work successfully requires abundant care and time. The history of extractive research practices and colonial power relations embedded in land and natural resource management have produced a range of critiques and proposed alternative approaches. Community-based participatory research emphasizes partnership between researcher and community – in which the latter are active participants in the processes of knowledge production and change-making (Minkler & Wallerstein, 2003) – creating a participatory, empowering process of co-learning and capacity-building (Israel et al., 2005; see also Wallerstein & Duran 2010). Parallels to these insights are also seen in work on community-based conservation and natural resource management (Brosius et al., 2005; Selfa & Endter-Wada, 2008; Dressler et al., 2010; Kremen & Merenlender, 2018; see also Lake et al., 2017; Adlam et al., 2022; Ellam Yua, et al. 2022).

From conducting research in the Arctic alongside Indigenous communities, Ellam Yua, et al. (2022) have similarly highlighted a participatory framework of knowledge co-production, emphasizing a systematic change in how research activities are conducted toward more equitable, inclusive, and useful outcomes. Trust and transparency are essential here, along with acknowledging the history of colonial power relations, exclusionary and extractive practices (‘parachute research’) – and past research failures – as part of a turn toward healing, bringing about real change and benefit for those

communities involved with research (see also Davis & Reid, 1999; Mail et al., 2006; Tom-Orme, 2006; Campbell et al., 2007). The events discussed below represent responses to these critiques and recommendations, demonstrating efforts to engage with and intentionally pursue relationships with Indigenous communities – including co-development of what co-stewardship and learning ought to look like in practice.

Methods

In developing our project, we have kept the research design intentionally open-ended and non-prescriptive, with a goal of co-production of questions, approaches, and outcomes (Ellam Yua et al., 2022). We approach this work through “two-eyed seeing” (Bartlett et al., 2012) – a method that integrates, while holding in tension, Indigenous and Western knowledges – which requires mutual respect and a relational attentiveness to place, history, context, and complexity. We deploy a critical social science engagement achieved through transdisciplinary and qualitative research – drawing on diverse insights from political ecology (Robbins, 2019 [2004]; Martin et al., 2019; Zanotti et al., 2020), critical physical geography (Lave et al., 2014; 2018), public health, and Indigenous studies, among other fields – to help tell alternative stories, not currently captured by agency research and resource management practices. As highlighted below, a commitment to co-development – rooted in dialogue and mutual respect – produces different questions, integrative approaches, and holistic aims that can better speak to local priorities (Smith, 2021 [1999]; see also Sayre, 2004; Drury et al., 2011; Charnley et al., 2017).

In approaching this work, we also seek to critically and reflexively examine our own collective positionality (see Boyce et al., 2022; Steen et al., 2024). Our author team, hereafter referred to as the ‘research team,’ includes two researchers with the USDA Forest Service; one nonprofit program director; three research fellows with the Oak Ridge Institute for Science and Education (ORISE); as well as two volunteer research assistants (see Supplemental Information: Author positionality statements for further detail). We are an equal mix of settler scholars and tribal members and descendants, all invested in natural resource management and elevating Indigenous voices,

bringing to bear our diverse professional backgrounds, knowledge bases, and lived experiences.

Beginning in the spring of 2023, individuals within our research team (JM and SH) were invited by each event planning group to participate in the two tribal co-stewardship-related engagements described below, one in Colorado and the other in New Mexico. Participants (JC, JM, SH, MH) took extensive fieldnotes while in attendance at the two events – conducting participant observation as part of a qualitative, case study approach – and crafted separate reflections for each engagement, which were then shared and discussed with the entire research team (Strauss & Corbin, 1990; Flick, 2007; Patton, 2014; Bernard, 2017). SH and MH facilitated one of the ‘World Café’-style breakout discussions at the New Mexico gathering. JM assisted the organizers of the Colorado gathering with a post-workshop survey and follow-up interviews (n=13) with attendees.

It was clear after participating in these gatherings that a summary weaving the two events together could advance current dialogues on tribal co-stewardship. The research team reviewed and compiled themes that emerged from participants’ fieldnotes and reflections, with a focus on the processes and practices of collaboration and co-stewardship. This grounded theory approach resulted in the themes identified in the Discussion, with an emphasis on contemporary lessons learned (Guest et al., 2012). In an attempt to holistically portray the multi-faceted nature of this research, findings are presented below through a combination of research findings, visual components, and personal reflections from some of the co-authors on their experience as researchers and tribal members.

Results

Quaking aspen co-stewardship (Colorado)

In August 2024, the “Climate Smart and Culturally Sustaining Co-Stewardship of Quaking Aspen” workshop was held on Ute land at the Rocky Mountain Biological Laboratory (RMBL) in Gothic, Colorado.⁵ Organized through the Center for Public Lands at Western Colorado University by the

Western Aspen Alliance and other partners, this two-day workshop focused on quaking aspen (*Populus tremuloides*) genetics, fire ecology, and co-stewardship, aiming to deepen understandings and relationships surrounding this widespread species. Speakers and attendees – including academic scientists, agency managers, tribal community members, nonprofit representatives, and industry practitioners from across North America – shared, learned, and worked through the changes and challenges facing quaking aspen and land management (Center for Public Lands, 2024; Calabaza, 2025). Prior to the event itself, participants met in two pre-workshop Zoom meetings to forge connections and discuss pre-selected readings (Latulippe & Klenk, 2020, Crouch et al., 2023; optional: Jacobs et al., 2022; Steen-Adams et al., 2023) – an exercise in finding common ground and developing a “shared vocabulary and vision,” according to one organizer, for the coming workshop.

Five federally recognized Tribal Nations were represented – Leech Lake Band of Ojibwe, Pueblo of Jemez, Ute Mountain Ute Tribe, Jicarilla Apache Tribe, and Turtle Mountain Band of Chippewa Indians – along with one Canadian First Nation, Samson Cree Nation. Several of the authors assisted in workshop planning and coordination: JC and SH conducted direct outreach to tribal natural resource and forestry department staff to encourage attendance; JM, SH, and EF provided social science consulting and analysis, including a post-workshop survey and interviews conducted with participants (n=13); JM and JC attended on-site, and SH attended virtually and contributed as an invited panel speaker.

The workshop opened with a prayer from a Ute Mountain Ute Tribe member, reminding the attendees of the critical cultural and historical context of the lands on which we met as well as the importance of our relationship to the land itself. Organizers emphasized goals of building trust and collaborative relationships, sharing knowledge and experience around Colorado aspen ecology and issues, and centering Indigenous voices and perspectives. The first day consisted of a series of panels and presentations exploring themes of

[5] <https://www.centerforpubliclands.org/cpl/aspen>.

co-stewardship, fire, and aspen genetics in the face of a changing climate, while the second day was devoted to field trips in the area that gave participants first-hand knowledge of some of the nearby landscapes and socio-environmental challenges related to aspen.

While the workshop emphasized the convergence of Western science and Indigenous perspectives, also on display were tensions surrounding such dialogue. Keith Karnes, Forestry Director for the Leech Lake Band of Ojibwe, spoke of how in the past the Tribe would be brought in at the end of the USFS planning process, rather than at the beginning. He also shared the Tribe's frustrations with being treated like a "special interest," rather than a sovereign nation with a trust responsibility from the federal government. However, the development of a memorandum of understanding (MOU) between the Tribe and USFS (2024) has since shifted practices toward shared decision-making, opening doors for conversation, change, and the restoration of traditional practices.⁶ Other workshop participants discussed how tribes could be inundated with consultation requests while struggling with capacity issues; on the agency side, there was often uncertainty over who to contact with tribes, particularly when wading into dynamics that implicated multiple Indigenous communities.

One notable activity on the first day of the workshop had attendees split into small groups to collectively define co-stewardship. The range of responses (Figure 1) demonstrated the many aspects and applications of this seemingly straightforward term.

In assessing the workshop, organizers felt it was “unevenly effective.” One noted that they had read a lot on inclusive organizing in planning, and that “[we] did a lot better than we could have.” However, they also felt that “balls got dropped,” as some had to step away from organizing – “life happens” – and planning faced structural challenges, along with difficulties in achieving greater Native presence in creation, planning, and facilitation. Another Indigenous organizer, however, saw it as “TEK in action,” and felt that planning was “all done in a respectful way.”

Questions of trust, respect, and historical harms arose early in the workshop, and while things remained professional and (mostly) civil, many non-tribal participants were “surprised by the depth of feeling expressed,” and “in some cases... not well-equipped to hear this feedback,” according to one organizer. This “friction,” to quote another organizer, “created some disruption in the agenda,” but insights from Indigenous participants’ (e.g., their

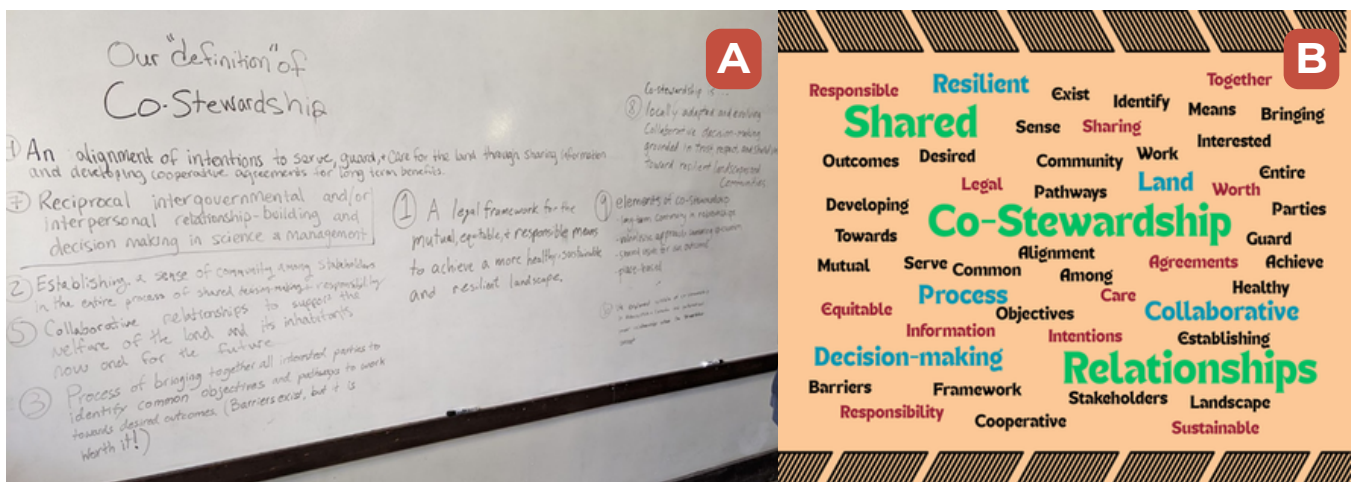


Figure 1. Defining co-stewardship. A) Definitions of co-stewardship created and shared by workshop participants (photo credit Jeff Martin); B) Word cloud generated from definitions, showing frequency of term use by size, colors were selected randomly. (Figure continues on next page.)

[6] <https://www.fs.usda.gov/r09/chippewa/working-with-us/tribal-relations>.

<i>"A legal framework for the mutual, equitable, + responsible means to achieve a more healthy, sustainable, and resilient landscape"</i>
<i>"Establishing a sense of community among stakeholders in the entire process of shared decision-making + responsibility"</i>
<i>"Process of bringing together all interested parties to identify common objectives and pathways to work towards desired outcomes. (Barriers exist, but it is worth it!)"</i>
<i>"An alignment of intentions to serve, guard, + care for the land through sharing information and developing cooperative agreements for long term benefits."</i>
<i>"Collaborative relationships to support the welfare of the land and its inhabitants now and for the future"</i>
<i>"We explored models of co-stewardship in Mexico, USA + Canada and problematized power relationships within the stewardship concept."</i>
<i>"Reciprocal intergovernmental and/or interpersonal relationship-building and decision making in science & management"</i>
<i>"Co-stewardship is... locally adapted and evolving collaborative decision-making grounded in trust, respect, and shared values toward resilient landscapes and communities."</i>
<i>"Elements of co-stewardship: - long-term continuity in relationships; - wholistic [sic] approach centering co-creation; - shared vision for an outcome; - place-based"</i>

Figure 1 (continued). Defining co-stewardship. C) Transcribed text from definitions in A.

"life experience... knowing the processes and local cultural norms and practices") were described as "really valued" and "critical." Many participants noted how the conversations at the meeting would not have been possible in other contexts, and inspired them to continue their own thinking, learning, and partnership development in the future.

While perhaps "too ambitious" for two days, organizers were proud of what was accomplished. The workshop brought people together, exposing many to ITEK and co-stewardship for the first time, through dialogue and "engag[ing] the

knowledge gap" – an effort that "moves us forward" and "hopefully set[s] a foundation" for future work. Clear points of consensus emerged around the keys to successful co-stewardship (Figure 2).

Speakers noted that while settler science and governmental structures are rarely optimized for co-stewardship, Indigenous and Western knowledge can be woven together through meaningful cooperation and collaboration – creating real, positive outcomes on the ground. However, dialogue requires that we "realiz[e] we're gonna have

Keys to successful co-stewardship
• Showing up to 'the table' • Valuing multiple perspectives • Taking time to build real trust • Working toward real collaboration (rather than just 'checking off a box' for Indigenous participation)

Figure 2. Emergent points of consensus

different people in the room with different forms of learning,” and thus tailor presentations to the audience. While presenters made clear that there remains much work yet to be done, the overall tone was hopeful and benefited from attendees spending time together and in place, having the opportunity to connect more organically through hikes, field trips, and sharing meals together. The event closed with a ceremony, as each attendee – with an aspen branch in hand – offered prayers, thoughts, and encouragement toward future co-stewardship, before throwing the branches into the fire (Figure 3), “watching the aspen – and our words – return to the earth” (Calabaza, 2025, 3).

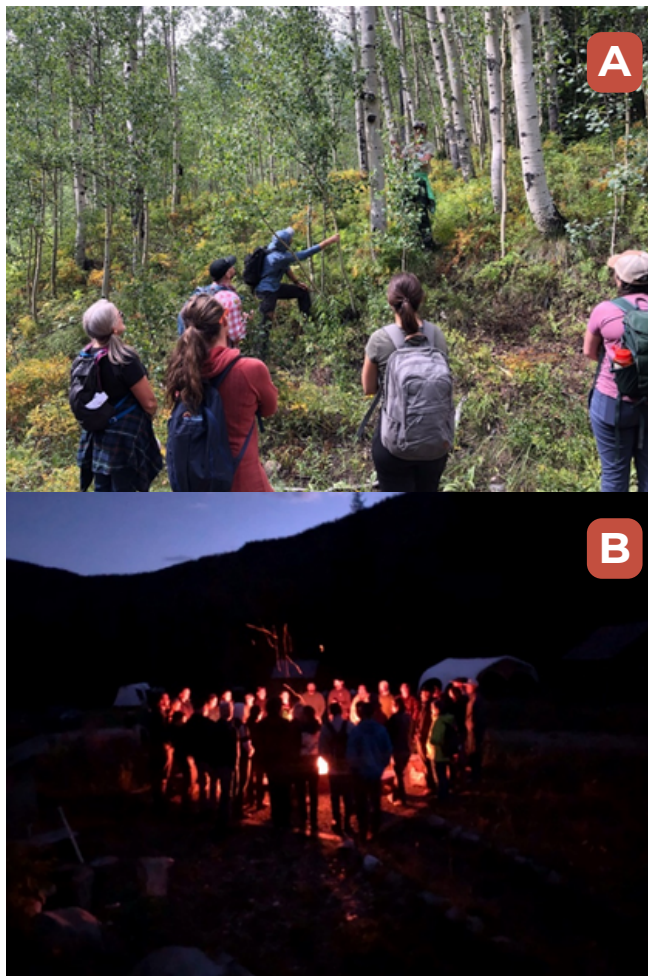


Figure 3. Scenes from the workshop. A) Participants examine local aspen during a field trip on day 2; B) Closing ceremony around the fire (photos credit Benjamin Wong Blonder)

Tribal forestry and fire (New Mexico).

The second annual New Mexico Tribal Forestry and Fire Summit took place at the Inn of the Mountain Gods over three days in March 2025, hosted by the Mescalero Apache Tribe (Figure 4).⁷ Tribal natural resource managers, non-governmental organizations (NGOs), federal partners, universities, and state representatives were in attendance, totaling approximately 250 people. There were 14 Pueblos/Tribes, 16 NGOs, 3 businesses, 2 utility service departments, 4 state institutions, 4 academic institutions and 6 federal agencies (Stewards of the Southwest, 2025). The event was “designed for and by Tribal and Indigenous voices and [was] meant to elevate them as they share[d] authentic experiences, challenges, needs and successes about working in the field” (Trees, Water & People, media communications 2025). JC, one of the authors in this paper, was the main conference organizer, while SH and MH attended the meeting in person and share their reflections below. Notably, one aim of the summit, including the ‘World Café’-style facilitated discussion break-out groups discussed below, was to inform the development of a strategic plan for the New Mexico Tribal Fire and Forestry Working Group’s next five years, which is undergoing final approval as of this writing.

Serra:

Attending the NM Tribal Forestry and Fire Summit was both uplifting and grounding. This gathering uniquely brought together tribal field staff, program managers, and partners within the forestry and fire professions, which fostered a sense of empowerment and collective brainpower, combined with the inherent cultural understanding of our responsibility to the land. The organizers of the conference nominated me to be the plenary speaker for the event. I was very honored by this request, and I focused my talking points on how tribal forestry programs can serve as models for innovation and leaders in natural resource management, as well as the future of self-determination with increased autonomy and use of federal authorities to promote self-governance. I brought in local examples from my experience, as well as citations from my recently published, congressionally mandated report on the status of tribal forests and forest management (Gordon, et al., 2023).

[7] <https://www.stewardsofthesouthwest.org/>.



Figure 4. Group photo from the New Mexico Tribal Forestry and Fire Summit (photo credit Zoe Bashkin with Trees, Water and People).⁸

The first day of the event included a presentation from Doug Neasloss with the Indigenous Guardians Network (IGN) in Canada,⁹ where decades ago their First Nations decided to stop waiting for government funding and began training their own people to become watchmen of the resources, who, via federal-tribal collaborations, eventually became certified enforcement officers to take over this formerly federal function. Their chiefs wrote the declaration where the watchmen are provided the delegated authority, and continue to experience 100% compliance.

The second half of the opening day was spent in 15 ‘World Café’-style roundtable discussions focusing on topics identified from past survey efforts, where participants decided which topic to join. SH and MH facilitated the conversation around tools, technology, and equipment (TTE). Other topics included: wildlife management, intertribal collaboration, fire program development, TEK, community engagement, watershed management, etc. The conversations would be summarized by facilitators and incorporated into a first draft of the Strategic Plan for the New Mexico Tribal Forestry and Fire Working Group (NMTFFWG).

Nearly 20 participants came to our roundtable and discussed four topics within TTE: heavy equipment/automated monitoring systems, personnel, new technology, and programs/software.

Alongside the notes from this initiative, my all-caps sideline displays “CREATIVE NATIVES” – and a quote from Doug Neasloss stating, “We all have stewardship responsibilities, this is the common ground.” This novel approach, grounded in Indigenous peoples’ connection to their lands, serves as a model for tribes across the United States to adapt to their contemporary needs. The IGN watchmen provided audience members with countless ideas and re-energized our work. I felt an enormous amount of pride in seeing Indigenous people directly protecting their resources. I then asked myself: how do we learn from our relatives to the north?

Personally, the most meaningful component of the summit was listening to the tribal leaders’ panel. Four Native leaders (Figure 5) shared stories of innovation, community wellbeing, and economic development interwoven with ancient and contemporary lessons around resilience. Their

[8] Additional images available online at: <https://www.stewardsofthesouthwest.org/photos-2025>.

[9] <https://www.rng-ngn.ca/>.



Figure 5. Tribal leaders panel at the New Mexico Tribal Forestry and Fire Summit. Indigenous leaders shared the lessons learned and challenges they encountered in their respective journey. (photo credit Zoe Bashkin with Trees, Water and People).

words captivated the audience and felt like moments of deep prayer for the health of Indigenous people and the sacred resources we manage. Sharing space with Indigenous professionals at this summit felt as powerful as going home for ceremony and left the audience with a greater sense of responsibility for striving to be the best stewards of our traditional homelands. This shared responsibility can be our beacon – when we collaborate, good outcomes will follow.

Mary:

Life seems chaotic, but at the 2nd Annual New Mexico Tribal Forestry and Fire Summit, there seemed to be calm in this atmosphere. In the room were folks from all different backgrounds, gathered for the same purpose: to support, uplift, and share experiences and knowledge among tribes within the Southwest and beyond. This summit focused on forestry and fire; fire gives us a sense of renewal and balance, and forestry is the connection and kinship that we need the most right now. As we sat there, we bore witness to tribal nations showcasing and solidifying their role as leaders in fire management and environmental stewardship.

A few themes that emerged during the roundtable discussion included how tribes are creatively thinking about funding, adding an inclusive workforce to predominately non-Native careers, and reaffirming that tribes are sovereign, each carrying

generations of knowledge through ITEK. Over the recent years, non-Natives have realized the importance of restoring fire to the landscape as an ecological necessity and a cultural imperative to many tribes. This summit brought to light some strategies to increase Indigenous representation and perspectives, which will be showcased, studied, and implemented by the NMTFFWG.

Although the summit focused on the Southwest, individuals from the Indigenous Guardians Network (IGN) were invited from Canada to showcase their Coastal Guardian Watchmen Program. This Indigenous-led program has gained British Columbia authority to enforce wildlife regulations, monitor cultural sites, and provide critical training to their tribal members. The success of the Coastal Guardian Watchmen Program can also inspire other tribes to think outside the box by diversifying funding and investment sources within their own networks.

Indigenous knowledge has been exploited in the past, and must be respected moving forward. To strengthen data sovereignty, the Coastal Guardian Watchmen Program created the Coastal Tracker to allow Indigenous communities to record wildlife sightings, monitor illegal activities, and secure their environmental data within their own data jurisdiction.

Having never attended an event or conference like this before, it is clear that this room full of change-makers has a deep understanding of the holistic approach to conservation, ranging from fire management to medicinal plant preservation, all while thinking of landscape-scale restoration. When Western scientists advocate for the return of fire to the landscape, we must see this as synonymous with and validating the restoration of Indigenous leadership in land management. Future generations will thrive in an environment where forestry and fire have strengthened economic resilience and ecological sustainability, all of which were discussed at this summit. In events like this, we are reminded that the most important takeaway is that true partnerships are the pathway forward. Indigenous stewardship is more than just forestry and fire management; it entails upholding sovereignty, preserving cultural practices, and ensuring the passage of generational knowledge.

Discussion

The two in-person gatherings described above differed in size, organization, goals, and outcomes. However, similar themes and questions emerged from both, in turn mirroring discourse our author team has encountered elsewhere working with Indigenous communities. In this next section, we synthesize some of the takeaways from these events, connecting them with themes that have emerged out of conversations with researchers, managers, and tribal partners over the past several years. We focus here on lessons learned and points of tension in the practice of collaboration and co-stewardship. By organizing these themes into four broad categories, developed using a grounded theory approach (Guest et al., 2012), we hope to demonstrate commonalities across varying efforts to advance cooperative land management and elevate the voices of Indigenous communities at the frontlines of environmental stewardship (Figure 6).

1. Knowledge: shared understandings

At both events – and in discussions with partners on collaboration between federal agencies and tribes – it is often noted that we are *talking past each other*, with “divergent definitions, interpretations, and applications” of terms like co-management and co-stewardship (Mills & Nie, 2021, 183). Such terms are not defined in law (Murray, 2023) and may be applied differently between agencies as well as over time and space. One organizer of the aspen

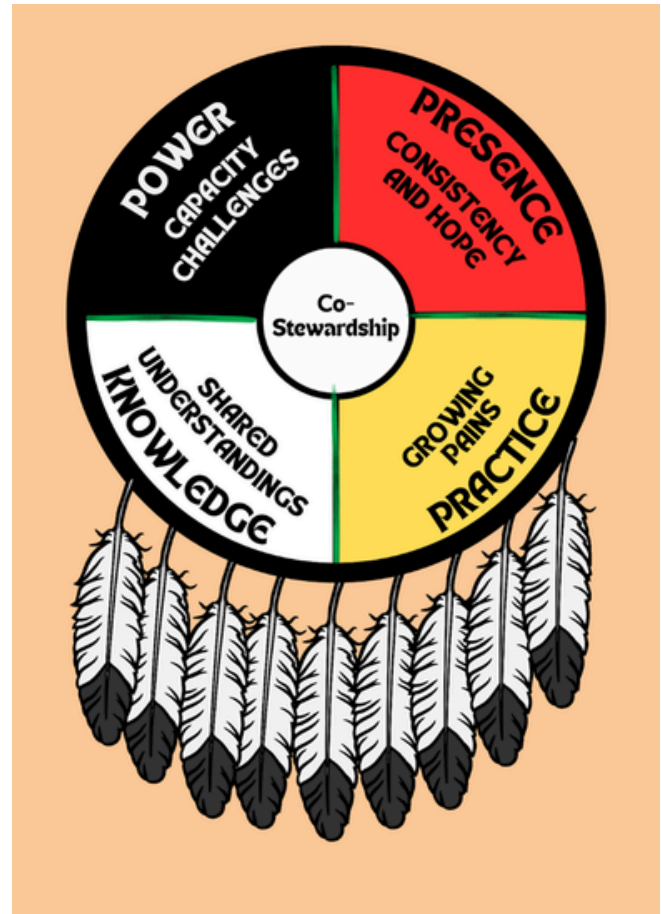


Figure 6. Emergent themes from work on tribal co-stewardship.

workshop explained how they saw co-management as “more table-based discussion... [a] due diligence process” of decision-making, while co-stewardship was more “boots-on-the-ground implementation” with “more community involvement, community engagement.” However, they also noted that earlier uses of co-stewardship had largely referenced tribal-tribal relationships and building coalitions, while more recent usage emphasized the tribal-federal government relationship. These differing interpretations highlight the value of exploring ideas collectively and building toward common, working definitions for the context and communities in question (Figure 1).

As term use varies between organizations, so too do approaches to land management. As one of the aspen workshop organizers noted, there are sometimes discussions, including within agencies, of “using” ITEK separate from people. In contrast, an Indigenous way of thinking stresses the inseparability of people, knowledge, and the land (Barlett et al., 2012; Teves et al., 2015; Larsen &

Johnson, 2017). However, not all Indigenous communities view ITEK and working with government agencies in the same light – particularly given differing histories, geographies, and disparities in legal status – resulting in complex relationships and the need for a co-defined approach to this work.

We continue to feel the legacies of erasure, as non-tribal staff working with tribes often lack basic cultural competency. However, it is unclear who should be tasked with training personnel in ITEK and cultural competencies, and whether needed resources are available. Expecting Native communities to instruct non-Natives in how to respect and work with them is an additional burden placed upon already limited capacities, often without clear compensation. At the same time, collaborations between those versed in Indigenous ways of knowing and those trained within a Western framework can be difficult without unpacking the norms and universalist assumptions implicit in Eurocentric ways of knowing (Stein et al., 2024). For example, co-stewardship/co-management often runs up against Western norms of privatized land ownership as well as jurisdictional contradictions. Indigenous peoples often describe the land as sentient and sacred, and their relationship with it as reciprocal and regenerative, sustained by mutual care and stewardship of the land and/as community (Whyte, 2018; Grand Canyon Trust, 2021).

When it comes to “natural resources” and their management – terms that are primarily propounded by federal land management agencies and rooted in settler colonial notions of ecological domination – Western ways of knowing are often unable to contend with the relational, multi-generational, place-based traditions of ITEK. As Dockry, et al. explain, “Different perceptions and definitions of natural resources can create conflict when building partnerships with tribes, according to participants... sometimes agency perspectives reduce natural resources to recreation or economic resources whereas tribal perspectives often recognize the same biophysical resources more broadly and as being intimately connected to tribal cultural identity” (2018, 130).

This connection to cultural identity is further linked with challenges surrounding ITEK and data

sovereignty, in which data is not viewed in the same way by tribes as in Western research methods. Certain knowledge surrounding ITEK and cultural sites is viewed as sacred and only shared internally as a means of protection and preservation (Carroll et al., 2020; Latulippe & Klenk, 2020; Tribal Legal Development Clinic, 2020; Steen et al., 2024; Ravindran, 2024). Indeed, to quote the USFS Tribal Cultural and Heritage Cooperation Authority Technical Guide, “the original holders of sensitive information may be the best holder of that information, sharing only with the Forest Service on an as-needed basis” (USFS, 2019, 23). This contrasts with a Western approach that often sees data as alienable from the communities and context of its production.

All of this is to say that the often-invoked “braiding” of Indigenous and Western knowledges (e.g., Kimmerer, 2013) is easier said than done, especially given durable power imbalances and absent dedicated training of agency staff and Western scientists (Hickman et al., 2023). This raises questions of whether such braiding – engaging in meaningful dialogue and collaboration – is indeed possible absent equal footing, full recognition, and respect, i.e., a serious engagement with questions of power.

2. Power, capacity challenges

Many tribes struggle with capacity issues, including workforce, housing, and other challenges. These questions are deeply rooted, inseparable from histories of colonialism, dispossession, and ongoing marginalization (White, 1983; Williams, 2025). Capacity challenges can create hurdles to engagement and participation – getting people “to the table” – as seen in both cases above. Organizers for the Colorado workshop noted the challenge of getting communication back from tribal nations despite “lots of outreach” over a period of months; however, one organizer also noted that those who responded were very receptive and thankful to be invited. The New Mexico conference had only 80% of anticipated numbers due to budget constraints and travel restrictions for staff with the Bureau of Indian Affairs (BIA) and other federal agencies.

Tribal staff often find requests for engagement – from universities, agencies, NGOs, etc. – overwhelming, burdensome, and not fitting within tribal priorities given limited capacity and time.

Indigenous community leaders may face unique obstacles to participation stemming from conflicting responsibilities, e.g., ceremonial obligations and pursuit of higher education (Gervais et al., 2017). On the agency side, budget cuts and staff turnover often hinder the ability to move forward on and achieve stated aims, including around collaboration with partners. For agencies and researchers tasked with or wanting to work with tribes, this can create bottlenecks that complicate access to tribal authorities for consent, collaboration on research, and other goals aimed at the co-production of knowledge. Importantly, however, as many informants noted, a lack of tribal response is *not* consent to advance with research (United Nations General Assembly, 2007; Gross, et al., 2021).

Co-production takes time and trust-building, with iterative and ongoing engagement, which may not fit with the timelines and structural pressures of agencies or academia (Ellam Yua et al., 2022; Steen et al., 2024). Those who successfully engage in co-production do so because of a commitment to the value of this work, yet addressing structural challenges would facilitate the expansion and greater effectiveness of these efforts. This raises questions around how government agencies might serve as better community partners, perhaps by providing resources to help alleviate these issues (e.g., lending equipment, providing training, covering travel costs, etc.).

3. Practice: growing pains

In navigating collaborations with tribes, we see needs for both cultural shifts and higher-level guidance on the emerging legal and logistical challenges. Non-tribal entities and agency scientists are often trained and evaluated based on Western norms and metrics (i.e., the number of peer reviewed citations), which do not always align with Indigenous values and lifeways. Yet as one of the aspen workshop organizers noted, it is “hard to assess the value of these kinds of projects” – the gatherings, like those described here, that do so much to build mutual trust and understanding – within a settler colonial framework. These challenges, as noted above, are inextricable from questions of power and the relationship between tribes as sovereign nations and the federal government. Unresolved questions of decision-making authority persist – including lingering

paternalistic dynamics among individuals and those codified in rules and regulations (Williams, 2025).

As one USFS employee noted after the aspen workshop, if we really want to pursue co-stewardship and promote tribal involvement, we need to arrange more tribally led meetings, where agencies and Western scientists are *not* the majority or setting the agenda. Another workshop participant agreed: “I would really just love for...all of these agencies to like, have a seat, and... listen to some Native folks.” As we have seen recently, however, federal promises can be unreliable amid shifts in administration and agency priorities (Williams, 2025). Despite efforts to center Native voices, the federal government has historically retained the final say, with few processes available for holding the government accountable to include tribes in land management decision-making.

Other challenges for agencies and managers working with tribes are bound up with bureaucratic hurdles around transferring resources to tribes and tribal members. For example, Joint Venture Agreements – one of the main vehicles for USFS scientists conducting research with tribes – once required a 20% match of funds, a major hurdle for capacity-limited Indigenous communities. It was only in 2022 that the then-USFS Chief issued an interim policy direction waiving this policy match requirement. At the level of individuals, there are additional logistical challenges around compensating tribal elders or practitioners for their contributions to research projects, as federal procurement and contracting requirements are frequently burdensome for less privileged, economically secure, and/or rural community members (Korostelina & Barrett 2023; Fenner et al., 2024).

Additional questions surround data sharing and sovereignty, in which rules and regulations may stand in the way of fulfilling tribal goals around ethical research practices and data management. These are multi-layered challenges, and navigating them takes time, capacity, and legal savvy often not available either to tribes or individual scientists. It is not always clear what the legal standing of tribes or researchers is around these claims, challenges which are further complicated when working with non-federally recognized tribal communities. Some tribes assert claims to historical information available in previously published sources. Other times, tribal

claims may stand in tension with other legal requirements on government employees (e.g., the Freedom of Information Act, or FOIA). We have heard expressed by both tribal partners and researchers the need for legal counsel in navigating these questions – although tribal law can be complicated and at times contradictory given the history of colonialism, trust responsibilities, and government-to-government relationships.

4. Presence: consistency and hope

Despite these challenges, the gatherings described above – and the fact that we are discussing these themes at all – demonstrate the continued resilience of Indigenous communities and their relationship with these landscapes. In the face of historical and ongoing dispossession and marginalization, tribal nations are “still here” (Iverson & Davies, 2014), fighting for dignity, sovereignty, access, and a place at the table where decisions are made regarding the lands to which they are inseparably connected (Larsen & Johnson, 2017; Simpson, 2017).

As Ron Skates, one of the contributors to *Wildlife Stewardship on Tribal Lands*, points out, “The politics change so often, it’s sometimes very difficult to keep any continuity going” (Hoagland & Albert, 2023, 29). Amid shifting agency priorities, available resources, and changes in administration however, Indigenous communities remain and sustain ties to place, holding onto local knowledge and the historical memory crucial for effective land and forest management in the future. Tribes thus can serve as a stewardship “anchor” or “stronghold” (Corrao and Andringa 2017; Jacobson et al. 2021), maintaining continuity amid dynamic social, political, and environmental change. As Steve Andringa, former Yakama forest manager and Intertribal Timber Council board member, put it, “They are here to stay.” Events like those described above provide a basis for collaboration, for bringing together Western sciences and ITEK (Calabaza, 2025, 2) – one grounded in ongoing Indigenous presence in place, providing a sense of hope and resilience amid the challenging circumstances of our time.

Conclusion

“There is power through unity as stewards of the land” -James Calabaza, New Mexico Tribal Forestry and Fire Summit, 2025

We see this research as an opportunity to use our positionality as a coordinated, multi-generational research team of Indigenous and settler scholars, to turn a critical eye onto contemporary practices and realities on the ground. We humbly aim to contribute to a reconciliation of the USFS’s history, culture, and authority with more recent agency goals – of expanding tribal partnerships and developing comprehensive co-stewardship guidance – toward the fulfillment of federal trust responsibilities to Native sovereign nations, and the common goal of improved management of public lands (all formerly Indigenous lands) and the natural resources we share for generations to come.

Our hope, with this snapshot and critical synthesis of two recent efforts at collaboration and tribal co-stewardship, is to contribute what we can to the efforts of our current moment – a period of flux at the federal level and activity driven largely by Indigenous people themselves – and to help reveal opportunities for substantive, meaningful change, toward reconciliation and justice (Mills & Nie, 2021, 182). As one organizer noted, these meetings and dialogues are “where all the uncomfortable things happen, but also [where] the progress happens.” We acknowledge and highlight here the many challenges to tribal co-stewardship in practice: power inequalities, ontological divides, entrenched opposition, and shifting policy priorities. We hope that this work highlights some of the continuity that *is* there, as well as the value of dedicated collaboration and its potential to uplift and empower those who take part. Many challenges and open questions remain, presenting openings for future research: *how can federal agencies and academic researchers better respect Indigenous knowledge systems and data?; how do such efforts play out differently in different contexts, and what can we learn while attending to the sensitivity of ITEK?; how do we recognize, respect, and reconcile tribal sovereignty with federal management?; and how do we invest in the collaboration and trust-building necessary to truly build co-stewardship?* This includes opportunities for researchers and managers to bring these insights into the practice of organizing future gatherings like those studied here, to learn the lessons and not make the same mistakes next time.

Following Latulippe and Klenk (2020), we hope that our work – here and in the future – is ultimately part of a process to “make room and move over,” to step aside and facilitate the work of Indigenous

people in continuing to push discourse and practice forward. For now, we are proud of the role our team has played in providing material support for young Indigenous scholars and the communities of which we are a part, as we collectively implement our values in practice and contribute in some small way to positive change.

Acknowledgements

Many thanks to Drs. Benjamin Wong Blonder, Roxy Cruz, and the other organizers of the aspen workshop, and to the Trees, Water and People team for coordinating the Tribal Forestry and Fire Summit. Thanks also to the anonymous reviewers who helped us to refine and improve our manuscript. We acknowledge and honor the past, present, and future Native communities who participated in the two in-person engagements.

The findings and conclusions in this publication are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.

Funding Statement

This research was supported by the U.S. Department of Agriculture, Forest Service with funding from the Infrastructure Investment and Jobs Act of 2021.

This research was also supported in part by appointments to the United States Forest Service (USFS) Research Participation Program administered by the Oak Ridge Institute for Science and Education (ORISE) through an interagency agreement between the U.S. Department of Energy (DOE) and the U.S. Department of Agriculture (USDA). ORISE is managed by Oak Ridge Associated Universities (ORAU) under DOE contract number DE-SC0014664. All opinions expressed in this paper are the authors' and do not necessarily reflect the policies and views of USDA, DOE, or ORAU/ORISE.

Images from this report were provided either directly by meeting organizers, co-authors with their consent, or via the NIFA grant to UC Berkeley via Dr. Benjamin Blonder.

Conflict of Interest

The authors declare that they have no conflicts of interest related to this research, nor any personal or financial relationships that could influence this work.

AI Disclosure

The authors did not use AI tools in the preparation of this manuscript.

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Supplemental Information: Author positional statements

Jeff Vance Martin (Settler scholar), Research Social Scientist, USDA Forest Service, Pacific Southwest Research Station

I was born in San Francisco, California and raised in the Bay Area, the lands of the Ohlone people. My family of mixed European descent have lived in the Western states (California, Arizona, Idaho) for several generations, and I was raised with a love for these landscapes and the diverse cultures and species we share them with. In high school, I helped found our school's environmental club, from which I made the jump to social and environmental justice activism and organizing. I pursued higher education at the University of California, Berkeley and the University of Manchester, where I was trained as a geographer, gaining a greater appreciation for the complexity and cross-disciplinary nature of the questions of our time. In my work I try to play a bridging and translating role – between disciplines, and between science, policymakers, and diverse publics – to help identify barriers to and openings for transformation, to contribute what I can toward building more just and sustainable futures.

Serra J. Hoagland (Pueblo of Laguna, POL), National Program Lead, Tribal Research, U.S.D.A. Forest Service, Washington Office

I was born and raised off my reservation in a rural town in Northern California, but my mother was active in the Indian Education programs during my childhood. The emphasis on education during my formative years, combined with my interest in ecology, led to my academic pursuits – where I eventually earned a PhD in Forestry from Northern Arizona University, an institution where my maternal grandmother (Elaine Paisano/Hamilton PoL) earned her bachelor's degree in the late 1940's. I learned to hunt as an adult on my reservation because I believed it would enhance my skills as a wildlife biologist and allow me to build a connection with our lands on an intimate level through countless hours in the field. Today as a professional, I gravitate towards serving natural resource management needs of tribes with a particular focus on tribes in the southwest.

Mary Hiney (Tohono O'odham Nation), Research Fellow, USDA Forest Service, Pacific Southwest Research Station / Oak Ridge Institute for Science and Education

I was born and raised in Oklahoma, off my tribe's reservation, which is located on the US-Mexico border in Arizona. I was raised near Oklahoma City by a single mother where I joined the Army shortly after high school, and I moved back to Anadarko briefly to be near my family after my mother passed away. I spent 10 years in the Army; I earned my Bachelor of Science in Environmental Science while I was active duty in South Korea, and I earned my Master of Science in Environmental Policy and Management while I was deployed to Kuwait/Iraq. Shortly before starting this fellowship, I earned a Bachelor of Arts in Ethnic Studies. I would not be here today if it weren't for Deborah K. Hiney, my mother, George F. Hiney, my uncle, and Aspen S. Adams, my daughter.

Sidney Paulina Williams, Research Fellow, USDA Forest Service, Pacific Southwest Research Station / Oak Ridge Institute for Science and Education

I was born and raised on the east coast of the US, a child of Korean and Colombian immigrants. A large part of my childhood was spent on the Western slope of Colorado, where I learned the value of place-based connections and land-based literacy, and have since pursued both an education and professional career that attempts to reconcile my deep-rooted affection for nature with my perpetual sense of displacement. Throughout my studies and personal experiences, I've found solace and inspiration in spaces that value alternative systems of knowledge (such as TEK), that emphasize our interconnectedness with nature, and that center decolonial environmental stewardship. By engaging in research related to tribal co-stewardship I hope to deepen my understanding and appreciation for the Indigenous communities who have stewarded these lands since time immemorial, and participate in self-reflective research within this dynamic field.

Morino M. Baca, Cultural Case Manager, Native CORE; Bear Bones Lab, UC Berkeley; Research Fellow, USDA Forest Service, Pacific Southwest Research Station / Oak Ridge Institute for Science and Education

I identify as a mixed-race individual of Native American descent who has had the privilege of pursuing higher education and attaining a master's degree in Public Health, as the first in my family to pursue a college education. As a father, husband, son, brother, uncle, nephew, grandson, and male role model for my community, I understand that I represent a patriarchal viewpoint and that my perspective is limited in this way. I aim to engage in research through a lens of similar lived experience that allows me to attain a greater connection and understanding of not only what we are researching, but more importantly with whom we are engaging in this research.

Emily Franco, Research Volunteer, USDA Forest Service, Pacific Southwest Research Station

I was born and raised in a family of mixed European descent in Milwaukee, Wisconsin, at the confluence of three rivers and Lake Michigan, a historic gathering place and home for many tribes including the Potawatomi, Ojibwe, Oneida, and Sauk peoples. I have been fortunate to pursue higher education at Boston University, University of Minnesota, University of Wyoming, and University of Wisconsin-La Crosse, where I have received training and conducted research in the areas of political science, law, natural sciences education, and recreation management. I have spent the last several years living and working on federally held public lands in the western U.S., and I am hopeful about a more just future for land management, restoring Indigenous voices and ITEK to the process.

Isabella Oehlerich (Settler scholar), Research Volunteer, USDA Forest Service, Pacific Southwest Research Station

I was born and raised on Lenape land in southeastern Pennsylvania. My father immigrated to the US from Germany in the 1980s, and my mother is a third-generation Italian-American. I was raised to respect and admire the natural world and developed a strong desire to protect it from a young age. In 2023, I earned my MS in Environmental Science and Policy from Clark University. I focused my studies primarily on environmental justice, and intend to dedicate my career to supporting and amplifying Indigenous land sovereignty efforts across North America and beyond.

James Calabaza (Santo Domingo Pueblo), Indigenous Lands Program Director, Trees, Water & People

I was born in Santa Fe, New Mexico and raised within the community of Santo Domingo Pueblo, New Mexico. My family raised me to be an active steward of the land through traditional practices of farming, community land stewardship, and participation in community ceremonies and traditions. Through these avenues, I earned valuable knowledge of valuing interconnectedness, honoring tribal processes, and valuing life as one ecosystem. As a first-generation college graduate, I was able to obtain a western-based education degree in Agricultural Economics and Business from Colorado State University. I use my combined wisdom to elevate Traditional Ecological Knowledge into land-management planning and curate cross-collaborative relationships based on trust and reciprocity. I have spent the last six years working with a non-governmental organization that prioritizes tribally led land management initiatives and preservation of cultural heritage.

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