

Bridging the Waters: Comparative Insights on Federal-Tribal Shared Stewardship of Wild and Scenic Rivers

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Over the past three decades, joint land and water management approaches involving two or more parties have been increasingly applied across the US federal government, including through shared stewardship arrangements with American Indian Tribes (Washburn 2022). Shared stewardship refers to voluntary partnerships to align goals, share data, and coordinate action around decisions regarding land and water, with or without the transfer of legal decision-making authority (US Department of Agriculture [USDA] 2018). Many scholars recognize that shared stewardship approaches can strengthen Tribal treaty rights, maintain or restore Tribal dignity and land relationships, and incorporate Indigenous Knowledge and values to benefit land stewardship (Steen-Adams et al. 2023; King 2007). Many Tribes have a strong interest in ensuring holistic environmental management of resources held in trust by the federal government. However, shared stewardship may involve difficult trade-offs for Tribes, including a lack of enforcement power or capacity to engage in management beyond Tribal jurisdiction (Stokes 2002).

As federal public land agencies seek to develop shared stewardship of land and water, research is increasingly advancing fundamental questions about such arrangements, such as what motivates governments to engage in this work (e.g., Stumpf 2001), what the outcomes of these partner-



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ships are (e.g., Steen-Adams et al. 2023), and how engagement can be carried out more effectively (e.g., Kalen 2022; Dockry et al. 2018). Although some studies have examined federal-Tribal shared stewardship in forestry and wildlife and fisheries management (e.g., Erickson et al. 2024; Steen-Adams et al. 2023; Goschke 2016; Diver 2009), a gap remains regarding shared stewardship of free-flowing rivers in the United States—in particular those designated under the 1968 Wild and Scenic Rivers (WSR) Act (P.L. 90-542).

At present, there are 228 river corridors designated as WSRs, totaling more than 13,000 miles (20,921 km) of river managed across the four federal administering agencies (Bureau of Land Management, US Forest Service [USFS], National Park Service [NPS], and US Fish and Wildlife Service). WSRs are managed to protect their free-flowing, undammed quality and are designated for their outstandingly remarkable values (ORVs), including scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values (Table 1). These values are identified in the enabling legislation at the time of designation or through development of the Comprehensive River Management Plan (CRMP), which outlines management of the river designation. Outstandingly remarkable values are identified because they are features that are rare, unique, or exemplary at a regional or national scale, therefore making the river segment unparalleled and particularly worthy of protection (NPS 2011).

Wild and Scenic River managers generally lack guidance on how to meaningfully engage Tribes in shared stewardship that

reflects treaty rights, worldviews, culture, and Indigenous Knowledge. Given the role of rivers as life-sustaining water sources that connect Tribal communities to each other, the ecosystem, and to important subsistence and cultural resources since time immemorial (e.g., Bland 2017; Ellis and Perry 2020; Sowerwine et al. 2019), understanding successes and challenges of federal-Tribal WSR shared stewardship is especially important. The research described in this article seeks to advance this understanding.

Methods

Research Approach

We used a comparative case study approach to address our research objectives. Case studies offer an in-depth look at a particular “case,” or a unit in a specific moment in space and time (Yin 1994). Through this approach, a case is examined in-depth to understand how social actors operating within the unit respond to and create different sociocultural worlds and meanings within the unit (Yin 1994). Findings from case studies are limiting because they are nongeneralizable, although they are often highly trustworthy and useful for understanding the particulars of an area of interest around a case (Suresh 2015). Comparative case studies—studies that examine two or more cases in concert—are useful for identifying, exploring, and understanding how different dynamics may lead to divergent or similar outcomes and can offer more explanatory power than a singular case (Bartlett and Vavrus 2017).

ORV	Resource specific ORV criteria
Scenery	Elements of landform, vegetation, water, color, and related factors resulting in an exemplary visual feature and/or attraction.
Recreational	Recreational opportunities such as boating, fishing, hiking, and wildlife photography are, or have the potential to be, popular enough to attract visitors from throughout the region of comparison or the United States.
Geology	The river or the area within the river corridor contains one or more examples of a geologic process such as channel braiding, a geothermal spring, or phenomenon that is unique or rare within the region.
Fish	Fisheries may be judged unique by evaluating aquatic habitat and/or population parameters such as natural reproduction, species diversity, and the presence of species of special concern.
Wildlife	Rare or unique terrestrial or aquatic species that are river-related including bald eagles, whooping cranes, river otters, or mussels.
Prehistory	The river or area within the river corridor contains a site(s) where there is evidence of occupation or use by Native Americans.
History	The river or area within the river corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region.
Other values	River-related values including hydrology, paleontology, ecology, or botanical resources.

Table 1 -Outstandingly remarkable values (ORV) of designated Wild and Scenic Rivers (NPS 2011)

We worked with the Interagency Wild and Scenic River Interagency Coordinating Council's Tribal Engagement Subcommittee (hereafter, "the Subcommittee") to identify relevant cases. Specifically, we focused on WSRs with recent updates to CRMPs that included explicit efforts to engage in federal-Tribal shared stewardship. Through discussion and initial interviews, we identified two rivers for comparison: the Eleven Point WSR in Missouri and Fossil Creek WSR in Arizona, both managed by the USFS (Figures 1 and 2).

Data Collection

We worked with the Subcommittee to identify initial key informants and relied on purposive sampling to identify other key informants, asking each contact to recom-

mend other contacts. Interviews were open-ended and sought to understand more about historical relationships, processes involved in developing CRMPs, current operations, and future planning. This approach enabled us to obtain information specific to each key informant's experience and knowledge base within the scope of each case. We stopped interviewing when we reached saturation, meaning no new key informants were recommended and no new ideas or themes emerged from the interviews. In total, we interviewed five federal managers on the Eleven Point River and nine on Fossil Creek. In addition, we conducted one interview with a representative of the Osage Nation Historic Preservation Office (ONHPO) about shared stewardship of the Eleven Point River,

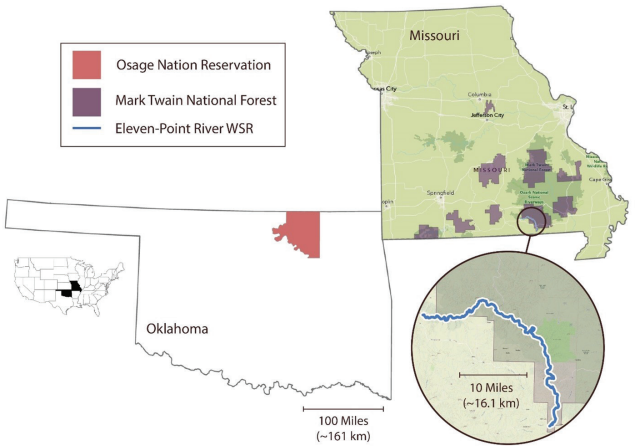


Figure 1 - Map showing the location of the Osage Nation Reservation in Oklahoma, relative to the Eleven Point Wild and Scenic River in Missouri's Mark Twain National Forest.

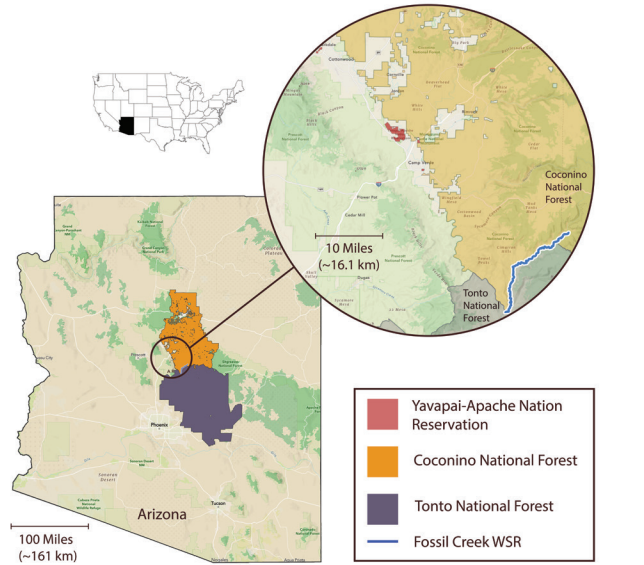


Figure 2 - Map showing the location of the Yavapai-Apache Nation Reservation lands relative to the Fossil Creek Wild and Scenic River between the Coconino and Tonto National Forests in Arizona.

and one group interview with three representatives from the Yavapai-Apache Nation (YAN) about shared stewardship of Fossil Creek.

Data Analysis

Data from interviews were synthesized and compiled to develop an understanding of the historical evolution of the federal-Tribal WSR shared stewardship efforts for each case,

shared below as stand-alone histories (Yin 1994). These individual histories allowed us to identify categories of importance shared across cases, ranging from key actors, issues, opportunities, and outcomes involved with strengthening shared stewardship. Through these categories, the research team identified commonalities and differences across cases, including several emergent key themes of federal-Tribal shared stewardship of WSRs. Combined, the results enabled the team to identify potential opportunities to strengthen federal capacity to engage in WSR shared stewardship with Tribes (Yin 1994). We shared results with study participants, members of the Subcommittee, and the USFS Office of Tribal Relations, requesting feedback to ensure accuracy of key findings and interpretation.

Findings

In this section, we first describe each case with an overview of why and how shared stewardship of the corresponding WSR was established. We then present a side-by-side examination of the cases to show similarities and differences between the shared stewardship examples and highlight three themes that link both cases and offer insights into federal-Tribal WSR shared stewardship.

Eleven Point WSR

The Osage Peoples have a long history across the US Midwest, but have settled and occupied lands in present-day Missouri, Arkansas, and Oklahoma for more than 1,000

years. The name Osage is an English rendering of a French translation of the name of an Osage subgroup, Wazhazhe. The tribe's original name, Niukonska, translates to "Children of the Middle Waters," indicating the importance of rivers for utilitarian, cultural, and spiritual reasons. Osage sacred sites are associated with caves, rock shelters, cairns, and mounds found along the Eleven Point River and across the wider landscape. Starting in 1808, the Osage Nation signed a series of treaties with the westward expanding US government and were ultimately forced to cede the vast majority of their homelands. As a result, the Osage are considered a removed Tribe. In 1872, they purchased reservation land in northeast Oklahoma that comprised a small portion of their original homelands.

The Eleven Point River is one of the original eight rivers designated with the passage of the WSR Act in 1968. It is located on Osage homelands in the Ozark Mountains on what is now the Mark Twain National Forest (MTNF), an important timber-producing forest in Missouri, and forms the western border of the Irish Wilderness. Although many other rivers across the region have been heavily modified, this section of river had been kept wild and captured the attention of the ONHPO as a priority location for cultural resource preservation.

Regional efforts to build relationships between Tribal and non-Tribal governments had been ongoing through initiatives such as the annual Bridging the Gap meeting and the USFS Region 9 Tribal homelands working group. However, the Osage Nation historically had a tumultuous relationship with managers

of the MTNF. Starting in 2016 with the hiring of a new forest supervisor and an archaeologist experienced in working with Tribes, the MTNF began to prioritize relationships with Tribes, especially the Osage. The forest supervisor recognized past injustices and promised to start their relationship on a new path, beginning with a USFS visit to the Osage Nation. In preparation for that meeting, the MTNF archaeologist requested that ONHPO representatives come prepared to share three things the MTNF did well and three things they could improve on. The ONHPO representative shared that "the idea we responded to was transparency, sincerity, and what does due diligence look like for us." This was especially the case for projects that required review under Section 106 of the 1966 National Historic Preservation Act. Section 106 requires federal agencies—and by extension any state, local, or private projects needing federal funding or permits—to consider how projects using federal funding, land, or permitting processes may affect historic and cultural resources. For projects that may impact Tribal resources, the law requires agencies to identify potential impacts, consult with state and Tribal preservation offices, and seek ways to reduce harm. Accordingly, Osage representatives requested that the MTNF prioritize Section 106 compliance, which was seen as foundational for getting to shared stewardship. As one Eleven Point manager emphasized, "It's important to have good [Section] 106 and other good resource conservation practice in place to begin with, before you start launching into post-106, post-compliance, stuff like shared stewardship."

Amending their process for compliance with Section 106, the MTNF signed a programmatic agreement with the Osage and nine other Tribes, the Federal Advisory Council on Historic Preservation, and the Missouri State Historic Preservation Office. This also elevated the Osage Nation's legal status to Invited Signatories of USFS Section 106 agreements, meaning they were invited along with the nine other Tribes to review and comment on the scope of work for all MTNF's outgoing contracts. As the ONHPO representative stressed, "We did the hard work to create the environment for good communication." The relationship established through this agreement became especially valuable when environmental impacts from wildlife were discovered at important Osage burial sites and after a historic 1,000-year flood in 2017 that required the USFS to take emergency actions to protect life and property.

The Eleven Point River CRMP was originally written in 1975, and by 2021 was well overdue for an update to better serve modern needs and uses of the river. The MTNF assembled an interdisciplinary team, led by a USFS Enterprise team member, who leveraged the improved relationship between the MTNF and the Osage Nation to collaborate with the director of the ONHPO in filling a gap in knowledge about cultural resources in the area. Together, this team outlined updates to the CRMP that better reflected the Osage Nation's values, priorities, and culture. Osage perspectives were incorporated in the CRMP revisions in two ways. First, language around "prehistory" as an ORV in the CRMP was changed to "pre-European contact." Second,

the federal government and the ONHPO agreed that including the Osage perspective as an appendix—rather than integrating Tribal perspectives into the main text of the CRMP—would most effectively codify their values and culture as management directives while preserving the Tribe's voice. This required more flexibility on the timeline for delivering CRMP drafts but was key to the success of this shared stewardship arrangement. The director of the ONHPO was recognized for her contributions with an Outstanding Wild and Scenic River Stewardship award from the USFS in December 2022, and the CRMP was signed by the MTNF forest supervisor in 2024. Additional co-stewardship efforts have continued since the signing of the 2024 CRMP, including exploring options to further protect Osage sacred sites from recreational development within the WSR corridor.

Fossil Creek WSR

Fossil Creek flows through the Tonto and Coconino National Forests (TNF and CNF) in Arizona and is managed by the Red Rock Ranger District on the CNF through a formal delegation of authority. This area includes the original homelands of the Western Apache Tribes (a broad term used to refer to several bands of Apache Tribes throughout Apache homelands) as well as the Northeast Yavapai people. These two people represent distinct cultures that have become blended through a shared history of relocation and assimilation. Fossil Creek is considered the birthplace of all Western Apache peoples and continues to be significant to their mythology, culture, and his-

tory. From the 19th century to about 1950, the area that is now the WSR corridor was home to several Western Apache families who avoided the forced relocations and assimilation experienced by many Yavapai and Apache people during that period. When Western Apache and Yavapai people were released from the San Carlos Reservation in 1900, many returned to traditional homelands and reconnected with those who had been hiding in the Fossil Creek area and preserving their cultural practices. In 1909, the US government reestablished the Camp Verde Indian Reservation for the Yavapai and Western Apache people in their traditional homelands of the Verde Valley, about 25 miles (42 km) from Fossil Creek. The proximity of this reservation to Fossil Creek helped maintain the close connection of Western Apache and Yavapai people to this sacred area. In 1992, the Yavapai and Western Apache Tribes renamed themselves the Yavapai-Apache Nation to highlight the distinct but blended nature of their cultures. The YAN now represents five tribal communities in central Arizona, including Camp Verde.

Fossil Creek was not always free flowing. In 1908, Arizona Public Service began construction of the Childs-Irving Hydroelectric Facilities (dam and flume system) on Fossil Creek, which remained in place for a century. Many Western Apache and Yavapai people contributed their labor to the dam's construction and continued to help maintain the hydroelectric facilities for decades, until their traditional homes and small schoolhouse along Fossil Creek were bulldozed and removed by Arizona Public Service in the 1950s.

In 2005, Arizona Public Service decided to decommission the hydroelectric facilities. At this time, the YAN advocated for the USFS to keep a road that provided important access to Fossil Springs for YAN Tribal elders and for emergency response crews in situations where cultural resources and/or personal safety might be at risk. Although regional USFS representatives verbally agreed, they ultimately chose instead to remove all infrastructure to mitigate potential liability. This decision created tension in the relationship between the YAN and USFS, and the YAN maintains that this decision was an act of mismanagement.

Upon decommissioning in 2009, the river was officially designated as a WSR, creating new challenges in managing skyrocketing visitor use and its associated impacts, including litter, human waste, vehicle congestion, and alcohol and illicit substance use by visitors. This, in turn, created challenges for the YAN to maintain access and connection to Fossil Creek. As a result, the YAN requested that the USFS change management approaches to reduce visitor impacts and increase Tribal access. The USFS responded by installing restrooms, instituting temporary closures and implementing a visitor permitting system over the following decade. To ensure that these changes continued to respect and accommodate YAN access to Fossil Creek, Tribal representatives have worked iteratively with the USFS since 2009 to update and implement a permit system specifically for Tribal members.

In addition to working collaboratively to maintain cultural access, the USFS sought input from the YAN in drafting the CRMP for the newly designated WSR, including identification of ORVs and development of a monitoring plan. To identify and prioritize protection of sacred sites and include Indigenous Knowledge in the CRMP, CNF archaeologists iteratively provided drafts of the heritage section of the CRMP to YAN representatives for review and comment. Together, USFS staff and YAN representatives developed thresholds for monitoring and managing the traditional and contemporary cultural values associated with the ORVs. This included language stating they would be "degraded if traditional cultural practitioners, principally Yavapai-Apache Nation, determine that the accumulation of adverse impacts impairs the Fossil Creek area." In this way, the CRMP codified shared stewardship with the YAN, ensuring that continued access and use of Fossil Creek by YAN Tribal members is incorporated into the cultural ORV.

In addition to direct Tribal consultation, shared stewardship of Fossil Creek has continued in several capacities. For example, to offset the financial costs of YAN involvement in CRMP development and implementation, the CNF funded a forest-wide Challenge Cost Share agreement with the National Association of Tribal Historic Preservation Officers, a national nonprofit whose mission is to support Tribal historic preservation programs. In another example, the YAN, USFS, and Arizona Fish and Game Department co-convened the Fossil Creek Working Group from 2015 through

the beginning of the COVID-19 pandemic to involve a suite of stakeholders and rightsholders. Additionally, the CNF secured Burned Area Emergency Response funding following the 2021 Backbone wildfire to support field trips with YAN elders and high school youth to monitor archaeological sites in Fossil Creek. Additional funds were made available as part of the CRMP six-year budget (2021–2026) for the cultural monitoring program.

Alongside co-developing traditional and contemporary cultural ORV, the YAN, together with the Tonto Apache Tribe, decided to pursue a nomination for a Traditional Cultural Property within the Fossil Creek WSR corridor. This designation would both document the Tribes' history and culture for future generations and ensure they have a say in management through Section 106. Together, the YAN and Tonto Apache Tribe worked with the TNF to cooperatively initiate the nomination process, providing necessary documentation and consultation with the Arizona State Historic Preservation Office, the USFS Regional Heritage Office, and other Tribes. The nomination process was stalled due to the need for more documentation and turnover of USFS project staff. However, the USFS today effectively manages the property as a formally designated Traditional Cultural Property.

Comparing Cases

We identified key aspects across cases that influenced both the preconditions of and out-comes from federal–Tribal shared stewardship. These aspects included the representatives and agencies involved, Tribal relationships with each WSR, priority issues that neces-sitated a shift in how representatives engaged with the WSR, policy mechanisms leveraged to enact shared stewardship and successful outcomes of shared stewardship, and when and how shared stewardship happened (Table 2).

Although the specifics varied between cases, we identified three main themes that underpin federal–Tribal shared stewardship, each discussed below. One is particular to WSRs—specifically the idea that WSRs are his-torically and culturally important sites where federal–Tribal relationships are acted out and enacted upon. The second two themes are not specific to WSRs, but are general to federal–Tribal relationships. They include the critical roles that archaeologists play in enabling shared stewardship opportunities, and the idea that first steps toward shared stewardship create opportunities for future collaboration.

Maintaining Tribal Connections to WSRs

Rivers were widely understood to be historically and culturally important sites both for Tribes and settler communities. Archaeologists emphasized that Tribes widely retain cultural and spiritual connections with rivers, regardless of whether they had been removed or relocated from the areas. In both cases, protections provided to the segment

of river through the WSR Act allowed holistic management approaches to encompass diverse cultural and nonextractive values. Dif-ferences between the cases also revealed that protections associated with WSRs can be both beneficial and detrimental to Tribes and their connections to rivers.

For example, in the Eleven Point case, the need to mitigate damage from a 1,000-year flood in 2017, along with the unrelated faunal disturbance of an Osage burial mound along the WSR, prompted the MTNF to strengthen their working relationship with the ONHPO. Because Osage ancestral remains were otherwise undisturbed, in part due to the WSR protections, the WSR designation encouraged USFS managers to show restraint in management practices to protect natural and cultural characteristics of rivers that were present prior to European arrival. For example, one manager explained that managing WSRs is similar to the “hands-off” management approach taken towards federally designated wilderness in that “I never feel like we are ‘managing’ the wilderness. You know, we are, we are stewards in that place to make sure that wilderness characteristic is preserved. . . . The more we manage, the more we muck.” He emphasized that the value of WSR protections provided a sort of promise of management restraint from USFS to Tribal partners who may be interested in engaging in shared steward-ship efforts, sharing that “I don’t want to get into the situation that our Tribal partners [who] are really connected to this land help steward something that we as an agency might muck with in the future.”

	Eleven Point WSR	Fossil Creek WSR
Involved forest(s)	Mark Twain National Forest (MTNF)	Coconino (CNF) and Tonto National Forests (TNF)
Involved Tribe	Osage Nation	Yavapai-Apache Nation (YAN)
Involved Forest Service repre-sen-tatives	Archaeologists; forest supervisor; recreation planners	Archaeologists; district rangers; recreation planner; Tribal liaisons; Wild and Scenic River manager
Involved Tribal representatives	Tribal Historic Preservation Office di-rector and archaeologists; Tribal elders	Cultural Office archaeologists and other staff; Tribal Council; Tribal elders
Tribal relation-ship with WSR and surrounding area	The Osage Nation were encroached upon starting in the early 1800s before forced removal, beginning in 1871; they currently have a reservation in Oklahoma, but retain significant cultural and spiritual sites along the Eleven Point River, including the WSR designation in Missouri.	Areas of the Fossil Creek corridor are “beyond sacred” to Western Apache Tribes, especially the Dilzhe’e Apache of the YAN—several of whom lived along Fossil Creek, including the WSR desig-nated portion, until the 1950s when their homes were bulldozed by the Arizona Public Service.
Priority issues that necessitated changing repre-sentative/agency relationships	The necessity to manage damage from a 1,000-year flood and the unrelated faunal disturbance of an Osage burial mound along the WSR prompted the USFS to strengthen how they carry out work with the Osage Nation Historic Preservation Office.	Increases in visitor use following dam removal and WSR designation threatened existence of and Tribal access to cultural sites. The USFS worked to reduce visi-tor impacts, engaged the YAN in CRMP development, and have worked with the YAN iteratively to improve Tribal access and protect cultural sites.
Policy mecha-nisms leveraged for shared stew-ardship	Improving compliance with Section 106 strengthened relationships and enabled the USFS to secure a pro-grammatic agreement with the Osage Nation, among other Tribes, for historic preservation work, especially related to cultural funeral and spiritual sites.	Formal consultation enabled the YAN’s contribution to the CRMP; Section 106 was leveraged to identify cultural ORVs and to pursue designation of a Traditional Cultural Property within Fossil Creek; a USFS Challenge Cost Share agreement with the National Association of Tribal Historic Preservation Officers enables Tribal members to lead monitoring of cultural ORVs.
Outcomes of WSR shared steward-ship	Programmatic agreement consultations created trust to work through CRMP process and advocate up the chain-of-command for more meaningful heritage-related ORVs and rewording of “Prehistory” and “History” ORVs to “Pre-European contact” and “Euro-American history”; Osage Nation added their perspective to the CRMP as an appendix to inform management of pre-European contact historical ORVs; MTNF and the Osage are presently pursuing other shared stewardship of cultural resources beyond the WSR designation.	The YAN were formally included in the development and drafting of ORVs within the CRMP; Tribal access to Fossil Creek was improved by forming and itera-tively improving a Tribal permit system for access; Yan and USFS nominated a Traditional Cultural Property along the WSR corridor; Relationships strengthened through WSR shared stewardship efforts have supported other shared stewardship efforts, including Emory oak restoration.
Key dates in WSR designation and Tribal shared stewardship	Eleven Point WSR was one of the initial eight WSRs (1968); turnover in MTNF leadership in 2016 initiated efforts to build Tribal relationships; updates on CRMP began in 2021 and the final revised CRMP was signed in 2024.	A long-standing working relationship between the YAN and CNF predated the 2009 Fossil Creek WSR designation; the CNF and YAN worked together to develop the CRMP and ORVs beginning with the 2009 designation through CRMP signature in 2021; implementation of cultural values ORV monitoring began in 2021; updates to Tribal access permit system occur itera-tively, most recently in 2023–2024.
Key actions implemented for shared steward-ship	Agreeing to meet Tribe on their terms (location, timing, with certain staff); meaningful recognition that sacred sites are a cultural resource; elevated Osage Nation legal status to Invited Signato-ries of USFS Section 106 programmatic agreements.	Formation and regular meetings of the Fossil Creek working group; staff-to-staff consultation on the YAN reservation to co-develop the CRMP, ORVs, and ORV monitoring plan; development of Tribal access permit system; monitoring of the cultural ORV performed with high school age Tribal youth and elders.

Table 2 - Summary findings from both cases comparing key actors, issues, opportunities, and outcomes involved with strengthening shared stewardship

“Findings from this study offer lessons to managers seeking to build meaningful relationships with Tribes around WSRs and highlight the value of those relationships for sustainable land management more widely.”

In contrast, the removal of the Childs-Irving Hydroelectric Facilities on Fossil Creek and the subsequent WSR designation had cascading impacts that impeded Tribal access to sacred sites, as well as the preservation of Tribal values and history. YAN representatives described the removal of associated infrastructure, in particular the connecting road, from Fossil Creek as “Forest Service mismanagement.” The decommissioning of the road and other infrastructure that Tribal members had built and maintained for decades was a point of tension between YAN representatives, county governments, and the USFS. According to a YAN archaeologist, the dam was removed all at once, which caused flooding and made the associated infrastructure unsafe—justifying its removal. He argued that if the dam had been removed incrementally, the infrastructure would not have become a liability. YAN representatives shared that this was especially problematic given the importance of road access to emergency service vehicles and river users, particularly Tribal elders. Removal of the road exemplified tensions over whose history and values are privileged in

WSR management. For example, this raised questions about whether management actions appropriately prioritize the interests of rights-holders over stakeholders and whether they meaningfully incorporate the Tribes’ continued and evolving connections to their homelands.

In both cases, co-development of ORVs proved to be a meaningful space to engage a broader range of histories and values, particularly in terminology surrounding the “prehistory” ORV described in Table 1. As discussions on the Eleven Point CRMP revisions progressed, the use of “prehistory” was understood to erase the forced removal of the Osage people by a westward-expanding US government. A USFS representative who worked on the Eleven Point CRMP shared:

A lot of CRMPs, if there's some kind of cultural resource, they use “prehistory.” And that was offensive to the Tribe. And they came up with wording . . . “pre-European contact history.” . . . So that to me was very interesting. . . . When you think about it, “prehistory” probably is pretty offensive, because we’re saying history started with European contact, which is not true.

In the Fossil Creek CRMP, the CNF decided not to include “prehistory” as an ORV, given that important archaeological and cultural sites were widespread across the region and that Fossil Creek represents recent and ongoing elements of cultural connection related to resisting forced relocation. Instead, collaboration between the CNF and the YAN resulted in the creation of a new cultural ORV called “Western Apache and Yavapai Traditional and Contemporary Cultural Values ORV” to better reflect the YAN’s continued cultural connections to the river. A former CNF archaeologist explained:

The historic [i.e., the Childs Irving Power system] was an ORV. As was . . . the Tribal cultural ORV—that captured the archaeology. It captured the traditional cultural value of the place and that hiding out and rejoining of the families basically up until the 1930s. . . . There was a lot of discussion around it and that’s where we landed.

Although the development and maintenance of relationships with Tribal partners required greater effort and flexibility, managers found the outcomes of these relationships beneficial to WSR management. In the Eleven Point case, the appendix written by the Osage Nation offered MTNF managers a culturally informed list of riparian plants to inform future consultation with Tribes and subsequent restoration efforts. In the Fossil Creek case, YAN feedback and co-development of the cultural ORV and monitoring plan ensured prioritization of Tribal cultural values in river management.

Participants widely expressed excitement about the new challenge of co-developing CRMPs—not only to better reflect emerging western scientific knowledge of rivers, but also to meaningfully integrate Indigenous Knowledge and culture throughout management of the WSR. Through the development and maintenance of their strong relationships, USFS and Tribal representatives were able to not only shift language around ORVs to better represent deeply complex and important Tribal connections to the WSRs but also to inform future management actions to preserve those connections.

Archaeologists as Bridge-Builders

Within the USFS, various representatives hold positions with responsibilities specifically related to Tribal engagement. Tribal liaisons are primarily responsible for managing and building relationships with Tribes across a range of topics and policies. In contrast, archaeologists (sometimes working as “heritage program managers”) engage with Tribes and various stakeholders on cultural resource-related issues and facilitate required consultation with Tribes, although their work spans a wider range of responsibilities. In both cases, archaeologists played a foundational role in establishing and maintaining good relationships with Tribal counterparts based on their knowledge of Tribal law, history, and culture; experience working with Tribes; and legal mandate to protect certain cultural resources. Access to and treatment of culturally important sites was central in both cases,

and relationships could either be strengthened or diminished as USFS and Tribal teams navigated the management of these sites (particularly through the National Historic Preservation Act of 1966). These efforts set the tone for federal–Tribal relationships and influenced other interactions and opportunities. For example, in the case of Fossil Creek, the strong, long-established relationship between YAN and CNF archaeologists was characterized by casual drop-ins or phone calls and informal meetings. This relationship enabled easier inroads into shared stewardship, as described by a former Tribal liaison for the CNF:

Part of the reason why I didn't have a huge role down there is they didn't really need me. . . . The District Ranger at the time was an archaeologist. And, you know, she would go and pick up lunch and she and [the district archaeologist] would go over and meet with the Nation and sit down and consult and talk about projects as frequently as needed. It was not very formal . . . they would just meet all the time, and that's actually the way it should be.

The good relationship maintained between USFS and YAN archaeologists enabled collaborative management in response to increases in visitor use in Fossil Creek—an issue that required the involvement of recreation staff. Specifically, both parties wanted to manage visitor use while ensuring Tribal access, a challenge that eventually led to the establishment and adaptive management of permitted Tribal parking passes. As visitor use management

systems are trialed and evaluated for maintaining visitor access, safety, and protection of ORVs, recreation staff on the CNF continue to innovate and monitor alongside their YAN counterparts.

In contrast, strengthening the relationship between the Osage Nation and the MTNF required facilitation through more formal consultation channels. As conversations between the MTNF and the Osage Nation deepened, ONHPO archaeologists demanded improved Section 106 compliance, as described by an MTNF archaeologist:

The Tribe was very, very dissatisfied with the [Section] 106. So the regional Tribal liaison who is at the meeting, he tries to, "Okay, let's whip out a bunch of funding that I can bring down to this and talk about what kind of collaborative things could we do? Why don't we forget the 106. What can we do collaboratively? Collaborative, shared stewardship, right? Stuff with Tribal youth, or engaging this, engaging that. I can get funding for it!" . . . [The Tribe], they're just like, "Forget it, we're not going to do a damn thing with you. Forget collaboration . . . we're not doing anything with the Mark Twain until they get their 106 straightened out."

Osage Nation representatives saw that the more casual shared stewardship approach suggested by the Tribal liaison would not be productive until the USFS could demonstrate adherence to legal mandates, as emphasized by the ONHPO representative who asked, "How are we expected to trust the Forest Ser-

vice with important harvesting areas if they still have yet to repatriate the ancestors?" Osage Nation archaeologists gradually developed fruitful relationships with MTNF archaeologists, as the USFS worked to comply with the National Historic Preservation Act across a range of activities, especially timber harvest. Over time, this trust was extended to work involving other staff and programs, including recreation, and resulted in commitment from the Osage Nation, led by a respected elder, to contribute an appendix to the CRMP. The appendix provided the Osage an opportunity to preserve their voice, knowledge, and perspective while ensuring these were codified into management planning and action.

Shared Stewardship as a Virtuous Cycle

In both cases, the establishment of one shared stewardship effort created a virtuous cycle of shared stewardship for and beyond WSR management. In the case of the Eleven Point, Osage archaeologists expressed concern about the disturbance of rock cairns and other Osage artifacts across the MTNF, including by some contract foresters conducting surveys and harvests, particularly as more archaeological survey work is contracted out. MTNF staff worked with ONHPO representatives to change wording in contracts to improve compliance with the Native American Graves Protection Act, and through discussions, they made other general improvements to contracting standards—what one USFS archaeologist referred to as "beyond 106":

You still got [Section] 106, we've got to. But what's beyond 106? Part of getting there was looking at our 106, bringing them into the process, like our survey standards. I looked at [our survey standards] when I got here. And I thought, these can be improved. But I've been a contractor so I rewrote them. I sent them to the Tribe. I said, "Hey, what [do] you guys think of this? You know, give me some input." [They said,] "No one ever asked us to do that before." I said, "Well, I'm not gonna ask you to rewrite it. I'm asking for your input, we can talk about it." And we incorporated a lot of it.

These efforts regarding 106 enabled "beyond 106" efforts between MTNF and ONHPO around CRMP revisions and facilitated additional collaborations to identify, protect, and restore other Tribally relevant sites within the WSR corridor. For example, MTNF staff worked with the Osage Nation to identify a sacred site within the Eleven Point WSR with the goal of reducing recreation-related impacts in the area. Tribal members have also been involved in providing trainings at key recreation sites to educate partners on the cultural values and history of those sites from an Osage perspective. The ONHPO representative expressed a desire to facilitate more Osage programs with MTNF staff, particularly in the WSR corridor, but shared that time constraints limit their focus primarily to ensuring Tribal sovereignty and protecting sites.

In the case of Fossil Creek, working together on the Western Apache and Yavapai Traditional and Contemporary Cultural Tribal Values

ORV led both the YAN and the Tonto Apache Tribe to identify and nominate priority sacred areas worthy of designation as Traditional Cultural Property on the TNF. One Tribal liaison shared that this designation would grant the Tribes more power in decision-making on the property, allowing them to say, "Oh, you want this activity to happen here? . . . These are our [cultural] resources. This is how we want you to protect them." Participation of the YAN in monitoring cultural sites created opportunities for shared stewardship beyond what was outlined in the CRMP. The CRMP details that Tribal traditional cultural practitioners hold authority to determine if cultural values are degraded. Grants supported workforce development opportunities, allowing YAN youth to participate in monitoring cultural and archaeological sites alongside YAN elders and professional archaeologists. This not only provided professional development opportunities but also facilitated a cultural connection among youth, elders, and their homelands.

Successful shared stewardship efforts within the WSR corridor also had benefits that expanded beyond the WSR corridor. In the case of the Eleven Point, MTNF and Osage archaeologists, along with other Tribes, began working toward a management plan for caves in the MTNF. This management plan would not only account for physical artifacts left by Tribes around the numerous caves on the MTNF but would also work to protect the nonmaterial cultural heritage associated with spiritual and religious connections to caves.

Similarly, in Fossil Creek, a 2018 consultation for large-scale restoration to inform the Tonto National Forest Management Plan provided an opportunity for Tribes to express their concern about Emory oak groves. A TNF Tribal liaison recalled, "All Western Apache Tribes were like, 'You guys are not doing a good job managing the Emory oak groves that you are currently responsible for. They're overgrown. You're preventing fire from getting into them. Our accessibility is decreasing.'" After receiving similar comments for several years, USFS representatives initiated a multiparty shared stewardship effort with representatives from the YAN, Tonto Apache Tribe, White Mountain Apache Tribe, San Carlos Apache Tribe, Resolution Copper, and Northern Arizona University. The effort focused on restoring and studying 18 Emory oak groves on the CNF, TNF, White Mountain Apache Tribe reservation, and privately held land owned by Resolution Copper. The restoration and research associated with the Emory Oak Collaborative Tribal Restoration Initiative (EOCTRI) are informed by Indigenous Knowledge, and all project decisions are brought to the project's Tribal advisory board for insight and approval. This co-management approach was recognized by the USDA when ECOTRI, the Kaibab, Coconino, and Tonto National Forests were awarded the USDA Office of the Secretary Nation to Nation Tribal Innovation Award in 2023 for incorporating Tribal values and priorities. This award is meant to incentivize and celebrate efforts to build meaningful relationships with American Indian Tribes

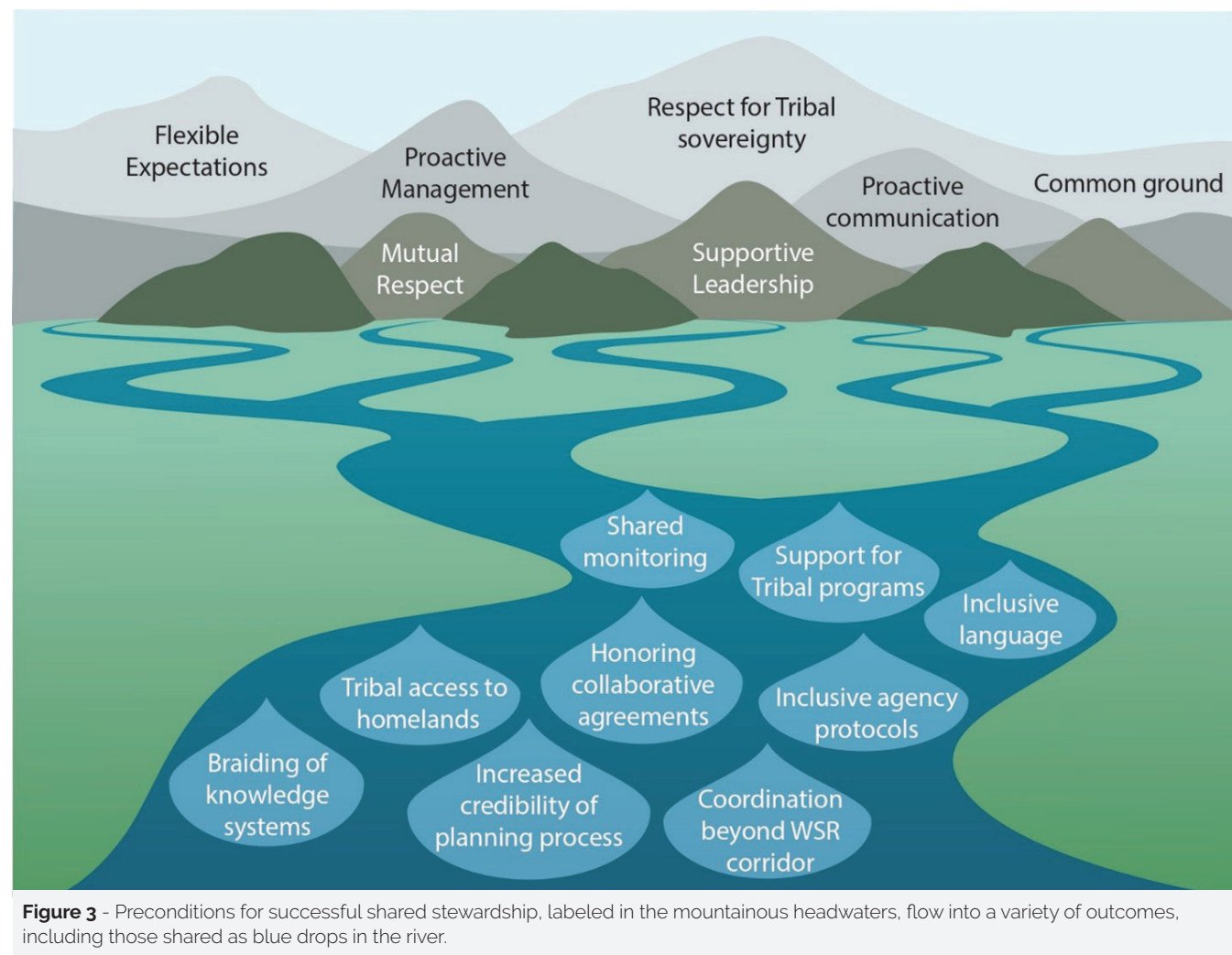
Discussion

WSRs have been and will continue to be important sites for human history and culture, representing areas where present-day and historical use overlap in ways that can either conflict or be compatible with Tribal values, worldviews, and culture. Furthermore, Tribal history is expansive and multilayered, reaching different resources and interests across Tribal lands stewarded by federal agencies today. Participants widely shared that federal agencies have not always valued relationships with Tribes or respected Tribal treaty rights, but commitments to shared stewardship within the context of WSRs offer opportunities to transform federal-Tribal relationships for the better. As both cases revealed, dedication is required to develop meaningful relationships grounded in effective communication and mutual respect, and these relationships can proactively mitigate undesirable impacts on sacred sites now protected through WSR designation. Formalizing relationships through signed agreements, formal contributions to planning processes, or working groups that meet regularly may require more flexible deadlines and creative approaches to authentically incorporate Tribal values, perspectives, and management priorities.

Like other studies, this one revealed that historical context remains foundational to federal-Tribal relationships, especially regarding the continued impacts of forced removal and relocation of Tribes (e.g., Lefthand-Begay et al. 2025). However, Tribes retained strong connections to their homelands, and the cases revealed how federal government representa-

tives can leverage the WSR designation to develop innovative approaches to protect those connections. Preconditions for successful federal-Tribal WSR shared stewardship included flexible expectations, proactive management, and supportive leadership (Figure 3). Mutual respect and common ground were essential to implementing shared stewardship, and were fostered through early, frequent, and clear communication and a sustained commitment to relationship building. Both cases emphasized that efforts by USFS representatives to meet Tribal representatives at their desired times and locations were critical for relationship building. In both cases, a confluence of natural resource-related issues on federal lands, including those impacting WSR ORVs, led federal and Tribal leaders to collaboratively initiate shared stewardship efforts for the WSR. Flexible deadlines, coupled with proactive management of WSRs, also enabled Tribal representatives to respond to requests for comment and to develop a shared vision alongside USFS representatives.

In both cases, increased federal-Tribal trust and capacity to steward WSRs were enabled through the formalization of work agreements and management plans, greater Tribal access to customary lands, shared resource monitoring, and strengthened lines of communication between governments. Furthermore, federal-Tribal shared stewardship may enhance WSR management, as Tribal perspectives on WSRs, desired conditions, and preferred ORVs may offer a more holistic approach to river management.



Relationships were central to the ability of federal and Tribal representatives to pursue effective shared stewardship of the WSRs and to extend collaboration beyond WSR corridors and associated formal agreements. Time spent together—both informally, such as over casual drop-ins or over lunch, and formally, such as at CRMP workshops or in consultation processes—was a key indicator of the possibility of shared stewardship both within and beyond the WSR corridor. Relationships built on trust and mutual respect are therefore the primary means of enabling the virtuous cycle of shared stewardship. Where staff capacity

among either federal or Tribal representatives is limited, challenges might arise in advancing shared stewardship (see Redmore et al. 2025, for related opportunities to build capacity). Such limitations may have repercussions not only for ensuring lawful Tribal consultation regarding protected resources but also for using the best available tools and knowledge—including Indigenous Knowledge—to inform land and water management.

Findings from this study offer lessons to managers seeking to build meaningful relationships with Tribes around WSRs and highlight the value of those relationships for

sustainable land management more widely. This work emphasized the centrality of archaeologists as bridge builders, but these findings may extend to other natural resource managers within different work contexts, including fisheries and wildlife biologists, foresters, and even engineers updating or removing infrastructure. As federal and Tribal representatives work on discipline-specific efforts, there are many opportunities to support two-eyed seeing and integration across knowledge systems in ways that can benefit federal-Tribal working relationships and Tribally important landscapes (e.g., Almack et al. 2023).

Future Research

This study represented a first step in examining efforts to build federal-Tribal shared stewardship of WSRs, and there remain many opportunities for additional research to further our understanding. Tribal governments, representatives, and members are deeply connected to WSRs, and future research could seek to broaden Tribal perspectives of WSRs and shared stewardship efforts. For example, there are many research opportunities to better understand the value and impact of Tribal youth partnership programs or other efforts to bring Tribal members into stewardship efforts.

Additional research could seek to further develop cases of federal-Tribal shared stewardship across different federal land management agencies. Such research could also advance understanding of how enabling

legislation and agency mission, policies, and practices may influence shared stewardship engagement. For example, the National Forest Management Act of 1976 (P.L. 94-588) mandates that USFS manage national forests for multiple uses, including resource extraction, which may be at odds with preservation of cultural resources. In contrast, the Organic Act of 1916 (39 Stat. 535, 16 U.S.C. § 1) established the National Park Service, whose mission focuses more on preservation of natural and cultural resources.

Furthermore, federal land management agencies offer different WSR governance systems that can influence the outcomes of federal-Tribal shared stewardship. For example, the Wood-Pawcatuck WSR designation in Connecticut runs entirely through lands that are either privately owned or managed by local governments. As a result, it is managed as a “partnership river” by a variety of constituents and rightsholders, including the National Park Service. The Wolf River WSR is the only WSR designation to flow through an Indian reservation and is jointly managed by the Menominee Indian Tribe and the National Park Service. These diverse governance systems may hold many lessons for strengthening federal-Tribal shared stewardship opportunities for WSRs as well as for the broader management and conservation of land and natural resources. 

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