



Partnership and Community Engagement Models for Stewarding National Scenic Trails: A Social-Ecological Systems Perspective

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ABSTRACT

Long distance trails offer distinctive opportunities for people to connect with natural and cultural heritage through recreation, tourism, and stewardship. Such connections can lead to broad support for conservation goals. In the United States, National Scenic Trails (NSTs) promote community engagement in trail planning, development, maintenance, and management. Governance of these multi-jurisdictional trails occurs through a diverse array of governmental and non-governmental actors. We conducted interviews (n=17) with federal trail administrators and non-governmental trail organizations to trail management and administration. A social-ecological systems framework helped us to examine power relations and dynamics in the NST network and identify the role that trails play in fostering community resilience. We observe that the NST governance model emphasizes partnerships with established non-governmental organizations and leverages relationships of these partners with community-based stewardship organizations. Targeted engagement of local partners may strengthen the NST system while improving opportunities for tourism development and community resilience.

KEYWORDS

Community tourism; stewardship; partnership; governance; social-ecological systems; national scenic trail

Introduction

National Scenic Trails (NSTs) have been designated by the U.S Congress to connect people with the natural and cultural heritage of the United States, providing outdoor experiences and learning opportunities. The United States supports eleven NSTs, many of which span hundreds of miles and traverse multiple states and management jurisdictions to provide opportunities for scenery, recreation, and nature connection. The governance model for these trails also provides important opportunities for management agencies to engage with non-governmental organizations and communities in trail stewardship and sponsorship. In the founding legislation of the National Trails System Act of 1968, which established the framework for NSTs, U.S. Congress acknowledged the integral role of volunteers and trail groups and set out “to encourage and assist volunteer citizen

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involvement in the planning, development, maintenance, and management ... of trails” (P.L. 90-543). Today, NSTs engage hundreds of stewardship partners working at local, regional, and national scales (Elkinton, 2018). National government agencies that administer the trail (“NST administrators”) and land management agencies that oversee the trail on governmental lands (“NST managers”) coordinate work with non-governmental trail partners (“NST partners”) to plan and maintain the trails, develop outreach programs, and connect with the public. NST administrators and NST managers have a dual commitment to encourage trail use and provide quality experiences to visitors while also conserving natural resources along trail corridors (U.S. Public Law 90-543, 1968). As governmental agencies wrestle with budgetary and capacity constraints (Cervený, Meier, Selin, et al., 2020), the multiple and growing roles filled by trail partners appears critical to the long-term viability of NSTs.

NSTs and connector trails provide an important means for visiting hikers and local users to connect with the outdoors, enhancing health benefits associated with regular nature contact and outdoor recreation (Thomsen et al., 2018). While long-distance hikers tackling the length of a National Scenic Trail hold a place in the popular imagination, the majority of NST visitors are day-hikers, short-term backpackers, and nearby residents accessing the trail. For some trail visitors, spending time at a trailhead provides a meaningful experience to connect with the trail’s legacy and symbolism. NSTs may traverse cities, pass through rural agricultural lands, or skirt ridgetops, all the while linking communities along the way. NSTs also provide stewardship opportunities for communities, which can strengthen ties to the trail and result in tangible and intangible community benefits (Gallay et al., 2016). NST administrators and partners increasingly recognize the importance of connecting with local trail organizations as well as communities and tribes to encourage local engagement and support for the trail. “Trail town” and “gateway community” programs strive to link trail users with nearby communities while supporting tourism, building awareness, fostering stewardship, and contributing to local pride.

In this article, we develop a new understanding of the complex nature of NST governance and explore the notion of shared stewardship across multiple NST partners with special attention to community engagement in trail stewardship. We address the following over-arching research questions: What partnership arrangements characterize the governance of NSTs? What are the roles of NST partners engaged in trail stewardship? How do communities engage in NST stewardship and how do these stewardship opportunities enhance community resilience? To frame our inquiry, we use a social-ecological systems (SES) approach that emphasizes the importance of understanding governance networks as integral to sustainable management of protected area resources (Folke et al., 2005; Koontz et al., 2015). We also rely on an expanded notion of sustainable recreation management that recognizes opportunities for stewardship and community engagement alongside environmental, socio-cultural and economic elements (Cervený et al., 2020a). Moreover, we recognize that community resilience can be fostered by policy that promotes stewardship actions. Our results are based on a synthesis of website data and qualitative analysis of 17 interviews with trail administrators and partners representing nine of the eleven NSTs. Our findings explore NST governance networks, including the dynamic roles of trail administrators, managers and partners, and the trend toward enhanced community connections with the trail, with implications for sustainability and community resilience.

Literature and context

A system of national trails to connect with nature and cultural heritage

Trails are as old as time, as they create an efficient passage for humans and animals to access resources needed for survival and to engage in trade and information-sharing. Long-distance recreation trails have been associated with the American experience since the turn of the twentieth century. In 1910, the Green Mountain Club laid groundwork for the Long Trail, traveling the length of Vermont, with a vision of connecting people with the beauty of nature. In 1921, the idea for the Appalachian Trail, extending from Maine to Georgia along the Appalachian Mountains, was conceived as a contiguous trail for city dwellers to escape to the countryside (Chamberlin, 2016). Interest in hiking and outdoor recreation boomed in the post-World War II era. Driven by hiking advocates and trail enthusiasts, the National Trails System Act of 1968 established the system to “provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation” (P.L. 90-543). The National Trail System includes both National Scenic Trails and National Historic Trails (and in 1972 was amended to include National Recreation Trails). The Act officially designated two trails, the Appalachian Trail and the Pacific Crest Trail. It also established the process by which additional trails could be designated. Each NST is assigned an administering federal agency responsible for coordination among land management entities, other landowners, and partner organizations (USDA Forest Service, 2014). Since then, nine additional trails have been designated. Some trails represent paths used by Native Americans before European colonization. Others follow historic trade or migration routes. Some trails follow rivers or the crest of iconic mountain ranges, such as the Appalachians, Rockies, or Cascades. Trail visitors are attracted to the physical challenge, scenery, solitude, and camaraderie that is often sought and found on long-distance trails (Cole, 2018; Hill et al., 2014), and these attributes become important settings for connections with nature, culture, and history. Trail users are sometimes drawn to the cultural history and remnants of these extractive uses, and these stories have become part of the marketing and interpretive programming for many trails (MacLeod, 2017).

NSTs extend across multiple jurisdictions and land ownerships (e.g. federal, state, tribal, local governments, and private entities), and vary in length, geography, and focus (Table 1). For each trail, either the National Park Service (NPS) or U.S. Forest Service (USFS) serves as the trail administrator, which coordinates and oversees trail planning and operations across landownerships (Elkinton, 2018, 2013). The lands that NSTs pass through are overseen and managed by different entities (NST managers), such as national parks, forests, and monuments; or refuges; state forests, parks, refuges and other management units; tribal lands, local (city or county) lands, lands conserved by land trusts, water districts, or private land-holdings (industrial or family-owned). Each NST manager oversees their unit based on different objectives. Reflecting broader land ownership patterns in the western states, NSTs are routed through predominantly federally managed lands, whereas those in central and eastern states more commonly have mixed ownerships.

The National Trails System Act encourages the engagement of non-profit trail organizations and volunteers in many aspects of trail planning and management (P.L. 90-543). In this vision, the stewardship of these trail systems and ensured protection and

Table 1. Descriptions of national scenic trails, chronologically by year designated.

National scenic trail (NST)	Year designated	Location	Length (miles)	Purpose
Appalachian Trail	1968	Trail extends from northern Maine to the northern mountains of Georgia	2,190	To follow crest of Appalachian Mountains
Pacific Crest Trail	1968	From Mexico to Canada through California, Oregon and Washington	2,650	To travel crest of mountainous western states between Mexico and Canada
Continental Divide Trail	1978	From Mexico to Canada through New Mexico, Colorado, Wyoming, Idaho and Montana	3,100	To traverse Continental Divide of North America
Ice Age Trail	1980	Entirely in Wisconsin, from the Minnesota border to the Michigan border	1,200	To highlight glacial landscape in Wisconsin
North Country Trail	1980	Across 5 northern U.S. states from North Dakota to Vermont	4,600	To highlight history, culture, and beauty of the Northern U.S.
Florida Trail	1983	From the Florida everglades to the Panhandle	1,300	To highlight beauty and diversity in Florida
Natchez Trace	1983	From Alabama through Mississippi to Tennessee	65*	To preserve prehistoric trade and travel route
Potomac Heritage Trail	1983	From Washington DC, through Maryland, Virginia and Pennsylvania	710	To preserve history and recreation in Potomac River corridor
Arizona Trail	2009	Entirely in Arizona, from the border with Utah to the Mexican border	800	To highlight the diversity of Arizona
New England Trail	2009	From southern Connecticut through Massachusetts to the New Hampshire border	215	To highlight culture and landscape of New England
Pacific Northwest Trail	2009	From Glacier National Park in Montana through Idaho to the Pacific coast in Washington	1,200	To show scenic beauty of PNW from Glacier NP to Olympic NP

*The NTT spans 400 miles and has five separate trails totaling 65 miles on the ground.

caretaking for future generations is shared across governmental organizations at different levels. Local trail groups and volunteers played a critical role in encouraging U.S. Congress to embrace the concept of a designated system of national trails and identifying trail routes (Elkinton, 2018; McPadden & Margerum, 2014). Each trail in the system has particular challenges which require different management and partnership needs based on the framework provided in the Nationals Trails System Act (U.S. Public Law 90-543, 1968). These management and partnership structures are indicative of the variation of the trails in the system (e.g. length, geography, purpose), the rate of trail development and maturation, and individual leadership and acumen of local partner organizations (Elkinton, 2013).

NSTs also serve as a connector between communities along the trail and create the infrastructure for engagement between trail visitors and communities. For rural communities experiencing declines in resource-extraction-based industries, trail-based tourism can be an instrumental component of rural development (Roberts & Hall, 2001). The influx of trail visitors to communities can result in new businesses and community-based organizations, adding new energy, vitality, and capacity to trailside communities.

Governance of national scenic trails: a social-ecological systems approach

A social-ecological system (SES) framework is helpful for understanding how management of NSTs can shape the relationship between humans and ecosystems. The use of

an SES framework derives from scholars exploring the links between ecosystems and human institutions, with recognition that these are inextricably linked and mutually modifying (Colding & Barthel, 2019). A social-ecological system is one that includes both human (social) and biological (physical) sub-systems in a state of mutual interaction (Harrington et al., 2010). Based originally on the work of Berkes et al. (2001), SES approaches explore how local ecosystems exist within regional ecosystems and how these embedded ecosystems are shaped (and vice versa) by the associated institutions that manage them. According to the original conceptualizations, management practices derive from local knowledge of ecosystems by resource users, which are likewise shaped by natural resource institutions and the regulatory environments in which they exist (Berkes et al., 2001). Resource management agencies are influenced by government institutions in which they are nested, as well as the will of nation-states. Moreover, these systems are dynamic and complex and face pressure from broadscale sociocultural, economic, or biophysical forces (Levin et al., 2013). The ability to share knowledge, promote institutional learning and adapt is critical to the long-term survival of ecosystems (Holling & Gunderson, 2002; Levin et al., 2013). SES theory has been variously defined, adapted and incorporated (see Colding & Barthel, 2019), with others building on concepts of infrastructure (Anderies et al., 2004) formal and informal governance (Ostrom, 2005), and the role of economies (Levin et al., 2013).

Governance of public lands and natural resources pertains to the structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how stakeholders have their say (Graham et al., 2003). Understanding governance systems involves both identifying critical social actors (governmental, non-governmental and private entities) and the dynamic relationships among them and exploring the patterns that emerge from formal actions (laws, policies, regulations) and informal agreements at multiple scales (Bodin & Prell, 2011; Ostrom, 1990). These networks structure power through differential flows of knowledge and resources. Understanding how decisions are made and by whom, how resources are allocated and to whom, and the distribution of power and influence is critical for managing ecosystems (Smith et al., 2005). Governance systems can be adaptive and dynamic, responding to change through establishment of new networks (Folke et al., 2005). Establishing and maintaining good governance across diverse ownership and responsibility arrangements is critical for the future of public lands and the social-ecological systems they support.

Governance scholars recognize that hierarchical, top-down, government-centric approach towards resource management have created problems and new models have shifted toward a systems-based, flexible and participatory strategies that promote learning through networks (Berkes, 2009; van der Brugge & van Raak, 2007). Ostrom (2005) notes that compared to formal modes of governance, informal and networked governance systems that operate at multiple scales can be more adaptive, dynamic, and allow the incorporation of different knowledge regimes. Power-sharing and benefit-sharing among governmental and non-governmental entities is important for building trust, capacity, and knowledge (Berkes, 2009; Snyman & Bricker, 2019). In recent years, new models of governance have emerged that promote multi-party engagement, including collaboration, co-management, community-based management, and partnerships (Borrini-Feyerabend et al., 2012). Co-management with indigenous groups with ancestral ties and active land-tenure relationships is increasingly important to sustainable

management (Nie, 2008; Plummer & Fitzgibbon, 2004). In addition, conversations around sustainability consider whether governing agencies have the capacity to maintain the resource over the long term and how they might expand capacity (Alibašić, 2018; Wang et al., 2012).

Community resilience through sustainable management and stewardship

Since the 1990s, sustainability has served as a guideline to help public land managers protect or conserve resources while contributing to the local economy and community life (Leung et al., 2018). The definition of sustainable development introduced by the Brundtland Report (1987)—“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”—was amended to illustrate that sustainability depends on the three pillars of economic, environmental, and social sustainability (Purvis et al., 2019). Recently, there has been emphasis on community resilience as a critical companion of sustainability. Community resilience is understood as the ability of communities to cope with change or thrive in an environment characterized by uncertainty or unpredictability (Berkes, 2004; Magis, 2010). Community resilience depends on the health and well-being of residents, presence of strong social institutions to guide appropriate responses to change, local capacity for leadership, local knowledge about resource systems, and opportunities for public engagement in resource management (Flora & Flora, 2004; Jamal & Stronza, 2009; Magis, 2010). In 2020, a group of U.S. scholars and practitioners introduced a conceptualization of sustainable recreation management that embraced the three pillars and that also recognized the role of stewardship. They characterized sustainable recreation management as “the provision of desirable outdoor opportunities for all people, in a way that supports ecosystems, contributes to healthy communities, promotes equitable economies, respects culture and traditions, and develops stewardship values now and for future generations” (Cervený et al., 2020a, p. 10). This definition recognizes that community-based efforts to engage in natural resources stewardship, such as forest restoration, trail-building, and aquatic habitat restoration, can enhance community resilience by engaging citizens in local conservation, building knowledge capacity about natural and cultural resources, and strengthening or creating social institutions (Berkes, 2004; Schild, 2018). Thus, stewardship is seen as a helpful component of community resilience and sustainable resource management.

Environmental stewardship is understood as the “actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to care for or responsibly use the environment in pursuit of environmental and/or social outcomes in diverse social-ecological contexts” (Bennett et al., 2018, p. 597). Stewardship includes a wide range of activities, such as collecting trash along a trail, restoring a forest area, building a trail, or creating a biosphere reserve (Johnson et al., 2020; Molsher & Townsend, 2016; Reed, 2016). Stewardship also is associated with enhanced place attachment (Trimbach et al., 2020). Community engagement in stewardship for a place can result in increased connection with and pride for that place (Landon et al., 2020). For youth in particular, environmental stewardship activities have been shown to build trust, promote social learning and ties, enhance ecological literacy, and support primary and secondary educational goals (DuBois et al., 2018; Pitt et al., 2019). As part of an expanded concept of

recreation, stewardship can be an important way to strengthen ties between communities and special places (Miller et al., 2020). One of the most important strategies for developing community support of protected areas may be community participation in resource management and developing a local sense of stewardship (Andrade & Rhodes, 2012). The approach is implemented through partnerships and capitalizes on shared interests and values, encouraging the engagement of long-standing partners as well as new and diverse groups (Derrien et al., 2019), and expand public involvement in resource conservation (Mathevet et al., 2018). On long distance trails, thru-hiking can foster a sense of environmental stewardship (Hill et al., 2009) and attachment to place (Kyle et al., 2003; Thapa, 2010), with some thru-hikers returning as trail stewards (Cole, 2018). These trail stewardship programs can foster human connections with nature (Hill et al., 2009), boost capacity for trail maintenance (Schild, 2019), and bolster support for conservation goals (Miller et al., 2012).

Methods

Our study involved the collection of secondary data about NSTs and primary data via interviews with NST professionals. We sought data about all 11 NSTs in the U.S. National Trails System. All data were collected in 2020.

We first built a database with descriptive information about all the NSTs. The NST database was developed using secondary data gathered from NST trail administrator websites, NST trail partner websites, managing agency websites and budgetary reports, founding legislation, and other public sources compiled by members of the research team. Direct conversations with NST administrators and partners also helped to fill in gaps in the NST database. The database included the following elements: year of designation, mission, NST administrator, trail length, completion status, landownership types, jurisdictions, primary NST partners, secondary partners, and other relevant information. The database served as a repository of trail information and helped to illuminate the complexity of the governance network.

We then conducted semi-structured interviews with trail professionals in two categories: NST administrators, and NST partner organizations. Potential interviewees were identified in agency directories, organization websites, or were recommended by colleagues. All interviewees were recruited using a standard recruitment letter and each participant signed an online consent form prior to the interview. The study team took all measures to protect human subjects and the project and all instruments was approved by the Utah State University Institutional Review Board [IRB #11413]. All participants were aware that their engagement was voluntary.

We contacted 20 individuals and completed 17 interviews, representing nine of the eleven NSTs. The sample included eight NST administrators and nine representatives of trail organizations. In addition, we supplemented our knowledge with conversations with three key informants who did not serve in either of our interviewee categories, but who had considerable institutional knowledge on NSTs at the national scale. All but two interviews were conducted by phone or videoconference; the remaining two interviews were conducted by email for interviewee convenience.

We conducted semi-structured interviews using a guide developed by our research team. Questions focused on the history of the trail and its designation as an NST, trail

visitation trends and management objectives, current issues and challenges, trail stewardship practices and partnerships, and trail connections with nearby communities. Depending on the mode of the interview and preference of the interviewee, interviews were either audio-recorded and transcribed, or captured through verbatim notetaking. Data were stored and managed to protect the identities of participants.

We conducted content and thematic analysis using both deductive and inductive approaches. All four authors read through the corpus of data and identified portions of text that offered insights into our research questions. We excerpted segments of text from our interview notes and organized them into documents and tables that we then circulated, discussed, added to, and refined among our team. Over the course of several months, we discussed findings and interpretations, and used these to develop conceptual frameworks and themes that collectively helped us answer our research questions. This paper presents our findings from this analysis specifically related to governance of trail systems and the role of communities in trail stewardship.

Results

To address our research questions, we examined the information we gathered through the NST database and interviews. We first present background information about NST governance networks oriented around trail stewardship and explore the dynamic roles of partners across the NST system from the national level to the community level. We then consider the roles and benefits of NST stewardship for nearby communities and implications for community resilience.

National scenic trail system governance and the role of partners

Given the variation of NSTs, the system employs a diversity of management structures and partnership models. Using data we gathered from NST websites, supplemented with literature on the National Trail System (especially Elkinton, 2013, 2018), and interviews with NST partners and administrators, we were able to capture the governance network of NSTs that includes NST administrators, managers and partners (Table 2). This table reveals that each trail includes a unique array of agencies, landowners and partners that exist on multiple levels. Six of the trails in the NST network are administered by the NPS and five by the USFS. Generally speaking, the NPS-administered trails tend to be in eastern or central states. With a notable exception (Florida Trail), USFS-administered trails are predominantly in the western states, where the proportion of public lands managed by the USFS is greater. Across the trails, there is diversity in NST managers listed. Trails in the eastern and central states have a greater diversity of land managers or owners, particularly state, local, and private landowners, than trails in the western states, which tend to be dominated by federal and tribal lands. When there is a match between the agency of the NST administrator and the NST managers, it may be easier to coordinate and share information.

We found that most NSTs rely on a central, trail-wide partner—an organization that operates across the length of the trail and serves as an “umbrella” coordinator for local partners. Other NSTs feature a series of partners and no single group that represents the entire trail. The partnership arrangement and the relative predominance of partners

Table 2. National scenic trail governance network.

National scenic trail	NST administrator	Main NST land managers	NST partners
Appalachian Trail	NPS	NPS, USFS, as well as state, municipal & private lands, land trusts	Appalachian Trail Conservancy (ATC) acts as land trust, coordinator, and main advocate. ATC delegates stewardship work to regional trail organizations and volunteer clubs, including the Appalachian Mountain Club. ATC coordinates four regional partner committees along the trail.
Pacific Crest Trail	USFS	NPS, USFS, Bureau of Land Management (BLM), tribal lands; some state, municipal & private lands.	Pacific Crest Trail Association (PCTA) acts as primary partner in all trail aspects (e.g. outreach maintenance, and advocacy) and coordinates with regional trail groups along the PCT. PCTA has six regional sections with local staff.
Continental Divide Trail	USFS	NPS, USFS, BLM, tribal lands, state, municipal, and private lands	Continental Divide Trail Coalition (CDTC) coordinates myriad regional and local partners for trail stewardship as well as support local advocacy in trail communities. Continental Trail Society develops guidebooks and information. Colorado Trail Foundation partners for joint trail sections.
Ice Age Trail	NPS	State lands, USFS, municipal lands, private lands	Ice Age Trail Alliance (IATA) serves as main trail advocate and coordinates volunteer stewardship, helps with trail design, and provides information and educational programming. Other partners include conservation, civic, and youth organization, and private landowners. Wisconsin DNR leads efforts to establish land corridors to protect the trail.
North Country Trail	NPS	USFS, NPS, state and municipal lands, private lands	North Country Trail Association (NCTA) coordinates regional and local partners. NCTA includes several chapters, and coordinates with local partners in those sections. NCTA works with other trail associations (e.g. Finger Lakes, Superior, and Buckeye) with common sections.
Florida Trail	USFS	USFS, NPS, US Fish & Wildlife Service, tribal lands, state, municipal lands, water management districts, land trusts, and private lands.	Florida National Scenic Trail Coalition coordinates the work of dozens of agency representatives, trail partners and the University of Florida. The Florida Trail Association (FTA) acts as land trust, coordinator, and trail advocate, coordinating 13 chapters for trail maintenance, outreach and promotion.
Natchez Trace	NPS	NPS manages the trail as part of 4 segments along the 400-mile Natchez Trace Parkway.	NPS services as the primary agency for coordinating trail stewardship. The Natchez Trace Parkway Association is focused on visitor amenities, interpretation, and programming along the parkway. The Natchez Trace Compact, is comprised of communities along the parkway organized to promote exploration of the adjacent communities.

(Continued)

Table 2. Continued.

National scenic trail	NST administrator	Main NST land managers	NST partners
Potomac Heritage Trail	NPS	NPS, state, municipal, and private lands.	NPS serves as the primary agency for coordinating trail stewardship. The PHT overlaps with several existing trails and these trail organizations are primary entities involved with trail maintenance, including the Chesapeake and Ohio Canal Trail, Mt. Vernon Trail, and the Great Allegheny Passage.
Arizona Trail	USFS	USFS, NPS, tribal lands (adjacent), and some state lands.	Arizona Trail Association (ATA) acts as coordinator, and main advocate. ATA responsible for trail maintenance in coordination with USFS. ATA coordinates advocacy, volunteer, and trail user groups to maintain the trail.
New England Trail	NPS	State lands (MA, CT), municipal lands land trusts and private lands.	Connecticut Forest and Park Association (CFPA) oversees Connecticut section. Appalachian Mountain Club (AMC-Berkshire Chapter) oversees Massachusetts section. Both coordinate with partners and land trusts, run events, and act as information sources.
Pacific Northwest Trail	USFS	USFS, NPS, BLM, tribal lands, state lands (ID and WA), and some municipal and private lands	Pacific Northwest Trail Association (PNTA) acts as manager, coordinator, and main advocate. USFS and PNTA work to coordinate organizations focused on maintenance, advocacy, and planning. University of Montana focuses on research for the trail.

may have implications for trail stewardship. NSTs that diverge from the model of a central NST partner split the roles among multiple partnering organizations. For example, on the Ice Age Trail, one partner focuses on land acquisition and the other focuses on maintenance and outreach. The New England Trail splits up trail oversight geographically among its two major partners. When an NST lacks a central NST partner working on the entire trail, the NST administrator plays a larger coordination role.

The sheer complexity of orchestrating partners at different levels and scales was noted. One NST partner described how the organization *works closely with agency partners on maintenance and works on coordinating other local trail stewardship groups, involving a huge network of partners large and small to maintain the trail*. Another interviewee indicated that their NST partner must coordinate stewardship activities across seven national forests, three national parks, local trail clubs and local chapters of a national user-group association. This multi-faceted arrangement between NST administrators, NST managers, and NST partners can have implications for how trails are supported.

Roles in trail stewardship for actors in the governance network

Interviews with NST partners and administrators identified a variety of roles for each of the actors and entities in the NST stewardship system (Figure 1). According to one interviewee, the distribution of responsibilities for NST oversight among NST administrators, managers and partners was designed to be overlapping and mutually modifying, where each entity brings a different set of responsibilities, resources, and capabilities to meet stewardship needs.

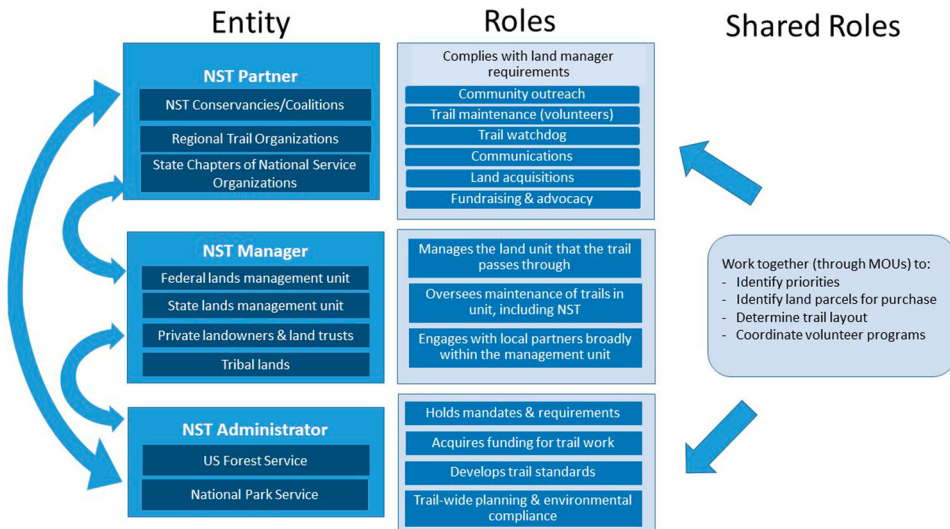


Figure 1. Partner roles in the national scenic trails governance system.

NST administrators set and communicate legal requirements, seek and obtain funding for trail work, oversight for the development of trail sites and segments, set trail standards for signage and marking, develop programs for interpretation, conduct trail-wide inventories and assessments, and convene NST managers and central partners. They typically oversee development and implementation of the trail management plan and address environmental compliance at the trail-level. NST administrators also represent the trail at national meetings, coordinate efforts across the NST system with other trail units and promote awareness of their individual trail and the NST system. According to our interviewees, partnerships and community engagement are important to NST administrators, yet the role of working with local groups typically falls with the NST managers and the central NST partner.

NST managers (public land agencies, such as a specific forest or park unit) are responsible for the local management of trail sections that pass through their jurisdiction. This includes overseeing trail maintenance, mitigating trail damage, installing signs, and ensuring public access to the trail. NST managers are required to follow federal, tribal or state laws and regulations, meet agency targets, balance a variety of land uses, and respond to public needs. They oversee the development of management plans and environmental assessments for their unit that the NST passes through and they ensure compliance at the project-level. Interviewees described how NST managers seek to balance multiple resource uses (e.g. recreation, habitat preservation, wildfire response, commodity production, water protection) as well as addressing special land designations in their unit (e.g. wilderness areas, historic sites, scenic rivers, scenic byways, and scenic trails). No decisions or actions related to the NST are made without the permission of the NST manager at the appropriate level of jurisdiction. Public NST managers often work directly with communities and engage a variety of local partner organizations in their unit. Their level of engagement with the central NST partner is variable.

The central NST partners work on behalf of the entire trail or major trail sections and fulfill many important roles. NST partners typically help in trail maintenance, promotion, and in developing relationships with local partners to address trail segments or sections. Roles are often taken on by the NST partner to fill a gap due to legal restrictions and limited capacity faced by the trail administrator, including trail advocacy and fundraising. NST administrators work closely with central NST partners on some aspects of stewardship, through Memoranda of Understanding. Interviewees representing several trails explained that the NST administrator and NST partner work together on layout, identifying land parcels to acquire, and identifying priorities for trail management. Many NST partners recruit and train volunteers from within their membership for trail maintenance, oversight, outreach, and educational programming. While NST administrators provide some federal funding for trails, trail partners can access additional funding sources through foundations and grants or internal fundraising drives. For example, one interviewee labeled the NST partner as the *philanthropic partner*. NST partners also emphasized their roles in providing up-to-date knowledge of trail conditions and for communicating trail updates (i.e. wildfires, landslides) to users. NST partners provide a critical conduit to trail users.

NST partners are the primary way that community connections are established with the trail itself. NST partner representatives that we interviewed described the proliferation of community programs designed to engage local officials and residents in trail stewardship and to bolster economic development around the trail. One key informant described that the success of an NST hinges on trust between the trail administrator and the NST partner, as well as local credibility, sharing that, *Local chapters have the credibility and contacts in the local communities. They have been essential to the success of the trail.* One interviewee described the trail administrator as the *internal glue* that brings together agency actions while the NST partner is the *external glue* that connects communities and local partners in trail stewardship. Many interviewees also indicated that the NST partner, through its local chapters and partnerships with other organizations, holds much of the on-the-ground knowledge of the trail and its users, and provides critical capacity to manage the trail. NST partners coordinate with local partners for trail stewardship, including maintaining trail sections or sponsoring community events. Such connections between trails and local communities can boost community resilience, through sharing local history, supporting businesses, and providing opportunities for local leadership and connection.

All NSTs exist on lands that once belonged to indigenous peoples and that are currently used by tribes under treaty rights. Some NSTs traverse or exist adjacent to tribal lands. Very little was mentioned in interviews about tribal engagement in NST management. A few NST partners and administrators we interviewed mentioned a desire to expand outreach and include tribal government leaders in NST processes but did not reference any specific examples of this occurring, nor was co-management noted.

Balancing roles and governing national scenic trails

The governance of NSTs depends on the shared goals and continual negotiation of roles between these three entities (NST partner, NST administrator and NST manager). While each plays a critical role in the stewardship and functioning of NSTs, our interviews did reveal tensions that can surface when priorities are not aligned or when there is not full awareness or different interpretations of NST requirements. Interviewees described

how tensions can emerge between the NST administrator and NST manager when the manager is not fully aware of trail mandates or conditions are required by the Congressional designation. For some land managers, NSTs may not be their primary focus and they must balance multiple management objectives within their unit. One NST administrator described how a land manager had allowed logging adjacent to the trail, while another mentioned nearby energy development. These extractive uses may threaten the scenic quality that the NST aims to preserve.

Tensions also can surface between the NST manager and NST partner when a manager prioritizes maintenance of other trails in their management unit over the NST, assuming others have responsibilities or resources to invest. Likewise, an NST administrator in charge of the entire system may not understand the local stressors on the trail or community dynamics that impact use. Furthermore, the NST administrator and NST partner can conflict over misaligned priorities, such as the type of use allowed on a trail, legal requirements for running volunteer programs, or building structures such as bridges on federal land. Another source of tension can surface in situations where the NST partner is advocating for the interests of their members and these interests may not be aligned with land manager goals or NST administrator priorities. The stewardship of NSTs requires careful navigation and negotiated understanding among these primary entities.

Community resilience through stewardship

We explored stewardship at the community level through our interviews with NST partners and administrators. We identified the different ways that many of the towns, cities, and counties that NSTs pass through, or come near, share in the caretaking or stewardship of the trail.

Nearby NST communities have developed multi-faceted relationships with the trails, that create the foundation for stewardship activities and that contribute to community resilience. One aspect of this relationship that interviewees described was the direct, community use of the trail as a recreational and public health resource. Community members use the trail individually for recreation activities, and part of organized group uses such as trail runs, birding walks, or special events such as races or hike-a-thons. Another aspect frequently mentioned in interviews was communities' tourism and economic development interests related to their proximity to the NST, to generate local business activity from trail users passing through, either as a launchpad for the day's adventures, or the re-supply point for multi-day trail users. Some communities use the national designation of the trail to market and brand the town for its outdoor recreation amenities and resources. Related to these tourism interests, a third aspect of community-trail relationships are the trails' effects on the social fabric of communities, bringing people from around the country and world to visit, who bring with them their diverse backgrounds and experiences. This is seen by many as a positive, cross-cultural dynamic; some mentioned a legacy of concerns about trails attracting people who were transient or undesirable to the community. In 2020, this flux of visitors was also considered through the lens of health and safety considerations, with interviewees describing community concerns with visitors entering their communities and the potential transmission of COVID-19.

Community relationships with the NST motivate community stewardship roles. The cultivation of a stewardship approach and the strengthening of community-based institutions play a role in enhancing community resilience, as these skills and resources can be parlayed into other aspects of rural development. For some communities, formal institutions exist, with established local trail partners hosting fundraising activities, organizing paid and volunteer trail workers, and promoting the trail through signage, marketing, and events. For others, stewardship activities take a less formal approach, with individuals and local groups self-organizing to maintain trail sections, trailheads, or parking areas as part of broader community service missions, sometimes even “adopting” a portion of the trail. Both formal and informal approaches require coordination.

Coordinating a local stewardship workforce

NST partners and land managers often coordinate work directly through local NST partner chapters, or coordinate with volunteer and paid trail workers from user groups, community service organizations, schools, and the conservation corps. Local trail stewards are recruited, trained, and organized to accomplish trail maintenance, re-routes, and construction, as well as other maintenance needs such as structures (e.g. restrooms and parking lots at trailheads, shelters along trails, trail signage). The local capacity to coordinate these efforts varies greatly and the level of engagement is related to the extent NST partners can support or lead activities. When the available local workforce is too small or lacking in particular trail expertise, volunteers and paid workers are enlisted from outside of local communities. One NST partner described a long-term stewardship ideal that is as *hyper-local* as possible, emphasizing care-taking activities that are close to home while focusing recruitment broadly. The NST partner explained,

I think that the big goal for me is to work myself out of a job and work the organization out of a job. If the trail itself is supported by the communities themselves and the state than we're unnecessary. That's sustainability. If each community cared for a portion of the trail, maintaining, and supporting, that's sustainability forever. So, empowering locals that was the first step. Keeping stewardship as hyper-local as possible.

However, this was not possible for some tasks; one NST administrator described an out-of-state seasonal workforce enlisted annually to travel across the country to perform specialized trail work during their own local off-season.

Volunteers often are the heart and muscle of NST stewardship activities. Many interviewees described volunteers as completing all or most of the maintenance along the trail. These volunteer contributions ease the management burdens of local land managers, and are also welcomed by municipalities who are supportive of the trail but worry about their abilities to construct or maintain connector trails, kiosks, signage, or other infrastructure that is within their jurisdictions. Volunteer support varies across NSTs. In 2019, total volunteer hours for NSTs ranged from 1,200 hours on the Natchez Trace Trail to 210,923 hours on the Appalachian Trail, with an average of 54,553 volunteer hours per trail (Partnership for the National Scenic Trails System, 2019).

Demographic factors affect the long-term viability of the local NST stewardship workforce. As the broader U.S. population diversifies, the demographic composition of the volunteer workforce has been slower to change. One trail partner described a *monoculture* among trail stewards, that could inhibit efforts to promote inclusivity and racial and

ethnic diversity in its recruitment of new volunteer stewards. Other partners talked about their deliberate efforts to promote racial and ethnic diversity among volunteers through its fostering of community relationships with local organizations and targeting recruitment efforts toward under-represented groups. Despite these efforts, volunteers were primarily white; an overall lack of racial and ethnic diversity among volunteers was noted. The local volunteer workforce for trails was also described by many interviewees as an aging demographic. NST administrators and NST partners expressed concerns about the loss of expertise and capacity as older volunteers became physically less able to consistently engage in trail work, and as younger generations of retirees and others seemed less interested in participating in trail stewardship activities. A trail administrator explained the challenging dynamic when highly engaged volunteers need to reduce their engagement (because of physical limitations or shifting priorities), and the leadership void in communities that sometimes persisted. When such a volunteer is serving as a “trail angel” (someone who supports long-distance hikers with rides or food packages), this can make the difference between whether trail users feel welcomed by a community. While not part of formal tourism infrastructure, this is an important aspect of the visitor experience in NST communities. These demographic trends affecting NST partners and trail groups could have implications for community-based trail stewardship in the future.

Seasonal and part-time work opportunities for youth were seen by interviewees as an important component of the local stewardship workforce for many NSTs. Some trail partners directly hire local youth, seeing it as a good way to connect with trail-adjacent communities and develop a future workforce that will develop enduring connections with the trail and fill in behind the current aging workforce, building community resilience for the future. These programs sometimes focus on engaging segments of the population that have not historically been engaged with their organization or the trail. Some partners organize these as youth corps programs, or through partnership with local high schools. One NST partner described a program that brings local youth to the trail multiple times per year so *they’re connecting with it and maintaining it and then they feel that ownership in their backyard*. Other trails focus on older youth, building connections with nearby colleges to host “adopt-a-trail” programs and participate in “alternative” spring break programs that enlist college students to spend a week volunteering on projects, with the intent of engaging volunteers consistently over their college careers. This model has been effective for trails that go through or near college campuses, as well as those further away, that host students who return home to trail-adjacent communities for school breaks.

Outcomes of locally driven stewardship

One of the immediate community benefits of locally driven stewardship that interviewees described was having a well-maintained, nationally recognized recreational asset in their *backyard*. Some interviewees emphasized the need for boosting local public awareness of this asset, particularly along trails that are less visited or established. Having improved access through spur or connector trails and clear signage was seen as important for community members and worth the stewardship efforts they require.

But, stewardship benefits for NST communities were described much more broadly than just having a well-maintained trail in the backyard. Interviewees saw the benefits

of local stewardship of NSTs as extending far beyond the trail tread and immediate biophysical environment. Interviewees described how the practice of stewarding NSTs, and the outcomes of that practice, have multiple benefits for NST communities. Interviewees described that one of the benefits derived from community-based stewardship activities is the social and community capital that they build, as residents come together around activities that serve a common vision. For many communities, caretaking for “their” section of trail is a point of community pride, promoting feelings of ownership for a resource that attracts visitors to their community. For others, trails seem to offer NST community members important opportunities for re-imagining and proactively transforming their identities. For example, one trail administrator described how once people get involved in trail construction, they then also develop broader interests that *transcend building the trail* such as providing interpretive programming that tells the story of their town. Whether part of long-standing or newly formed traditions, as volunteers work together, they get to know each other, building community capital and pride. Interactions are fostered across generations, as youth groups, retirees, college students, and others share in stewardship. Trail stewardship can also be a unifier for recreation groups that have experienced conflict, as one trail administrator observed, underscoring common interests and harnessing shared goals to work together.

Finally, many see stewardship of a particular segment of an NST as a linkage to broader ethics that extend beyond local connections. Working on a local stretch of a long-distance trail connects community members to the other places the trail leads, and to the tourists who visit their communities. Community-based stewardship activities also connect community members with the trail’s national significance imbued by its official designation. One trail administrator described how the connections to a local stretch of NST often extend to the entire trail, and sometimes to public lands more generally. Forging those connections with youth and young adults can help build life-long stewardship connections, an outcome that is likely more enduring than the stewardship task at hand.

Community health and resilience

Community access to NSTs also contributes to improved health and well-being of local residents who have access to the trail. Several trail partners listed *health, happiness, and education* as benefits that local community members gain through involvement in trail stewardship activities and bring back to their communities. As one NST partner explained, *The more time people spend on the trail, the happier and healthier they are*. In addition, NST partners act as social institutions that can support community priorities and provide training for local leaders, which can translate to other aspects of community life. Opportunities for community members to benefit from the NST near their home can enhance that community’s ability to adapt to change.

Engagement of nearby residents in the stewardship of NSTs also serves to benefit the entire NST system. Local knowledge about resource systems is often highly valued by NST administrators, with local chapters of partners acting as *eyes on the ground* for the trail. As one trail partner explained (paraphrase), by having local community members on the advisory committee, *It has been great to hear directly from people who live and work in those communities and who can put on the hat of what the gateway communities want on the trail*. NST administrators, managers and partners gain insight and information

from residents about nearby ecosystems which can potentially benefit the trail as a whole or the entire NST trail system.

Discussion

National Scenic Trails provide opportunities to link tourists and local visitors with iconic trails and the communities they connect, while conserving these resources for future generations. Using an SES framework, we see how the stewardship of NSTs enlists a variety of entities at national, regional and local scales, including NST administrators, NST partners, NST managers. The governance structure is designed to work in tandem so that NSTs can be adequately funded, maintained, supported, and stewarded. Understanding the dynamic relations and tensions between administering governmental agencies, non-governmental NST partners, and landowners is critical to the sustainable management of the trails in the NST system and to the resilience of NST communities. Community engagement in trail stewardship both fosters community resilience and improves sustainability outcomes (Magis, 2010). This system-wide view also draws attention to untapped opportunities for enhanced community engagement.

Governance networks in stewarding national scenic trails

Using an SES framework, we may conceptualize the governance of NSTs as a dynamic and adaptive system that exists at multiple scales and responds to internal or external change (Berkes et al., 2001). Understanding power relations and the institutional dynamics that mediate human environment relations is important for generating resilient systems (Ostrom, 2005). Our analysis revealed a diversity of roles of three main entities responsible for managing and stewarding NSTs. Because each land management agency operates with its own set of governing regulations and practices, NST management across jurisdictions and even within sub-units of the same agency can be variable. Interviewees described tensions in trail stewardship stemming from inconsistent communication with NST managers along the trail corridor, and the different values they place on NST efforts such as ensuring consistency for trail users across jurisdictions. Other cross-boundary land management efforts have found excellent communication between multiple entities to be critical in accomplishing goals (Cyphers & Schultz, 2019). Improvements in communication and coordination among NST administrators, NST managers, and NST partners might be useful to overcome existing stewardship gaps.

Our analysis focused on the role of NSTs in fostering stewardship and enhancing community resilience. Based on our examination of the NST system, we recognize that while the governance of NSTs has built-in overlaps in the roles between the NST administrator, NST manager, and NST partner, the primary responsibility for community engagement falls squarely on the nongovernmental NST partner. NST administrators seek to facilitate those community ties but lack the capacity for local engagement. NST managers engage partners at the unit level where they are held accountable but may not have partner relations or prioritize regional trail system partnerships. This arrangement places the NST partner in the role as mediator of local concerns. A strong, organized, and well-funded NST partner may cultivate community stewardship and engagement all along the trail. Other NST partners with fewer resources may not activate those opportunities

for community stewardship and engagement. These inconsistencies in community engagement across the NST system present a potential threat to system health.

This analysis also revealed the need for a process that engages tribes as landowners and land managers. Currently, NST partners are the most actively engaged with partnering and stewardship around NSTs because they have capacity, institutional knowledge, and means. In 2000, President Clinton issued Executive Order 13175, which mandated that tribes and federal agencies engage based on government-to-government relations. NST administrators at the trail-system level and NST managers at the management unit level are in the best position to work with tribal leaders. Successful cases of co-management for cultural heritage with indigenous tribes in Wyoming, New Mexico and elsewhere may be examined to gain insights for co-management of NSTs (Nie, 2008; Pinel & Pecos, 2012). Building capacity for tribal engagement and co-management could help to improve resiliency of the NST network.

Community-based partnerships—backyard stewardship and resilience

The dynamics of local natural resource stewardship has been examined in several contexts, including in terms of outdoor recreation management (Schild, 2018; 2019). In our study, the context of NSTs offers a legislated multi-level system of stewardship that links governmental and non-governmental entities at national, regional, and local levels. The interaction and dynamics among these entities stewarding NSTs comprise what has been called a “management system”, rather than simply management or stewardship, emphasizing the networks of institutions and actors that enact multiple kinds of activities, goals, and processes (Lertzman, 2009). Clear visibility and understanding of this management system are important for decisions about the allocation of resources and decision-making powers at all levels. Within this system, often the “face” of NST stewardship is trail-wide governmental and non-governmental partners, and our research suggests the need for more visibility and understanding of local stewardship systems embedded in the overall management system. Our finding that local, on-going stewardship activities are viewed as critical for building NST system resilience, and require supports by various extra-local entities, is consistent with other conceptualizations of resilience design (Curtin, 2014).

Community resilience necessitates agile organizations, adept local leadership, sustained capacity, local knowledge, and a healthy and engaged public (Magis, 2010). Our study points to the importance of these NST-community connections, investments, and relevance. Local, *backyard* stewardship of trail resources emerged as an important element of the management system in our study, and not simply in terms of the tangible outcomes such as the improved physical condition of the trail. The community and social outcomes that result from these efforts might be considered as more than simply side benefits, but rather as central drivers of the work and the resilience of the system in the first place. We see the need for future research that further explores the local-level dynamics of stewardship for these national resources, building on analytic frameworks (e.g. Bennett et al., 2018). This includes examination of particular models of “trail town” and “gateway community” programs that are hosted by non-governmental partners, and how they help communities harness their collective (and multi-dimensional) interests in trails, including tourism, economic development, stewardship, and community identity

and pride. Furthermore, building on work about diversity and inclusion in stewardship partnerships (Makopondo, 2006), our findings point to the ongoing need for improving all NST stewardship partners' abilities to promote relevance and engagement among a wider swath of the public; this was observed as particularly important among volunteer and service participants.

Connecting rural trail towns with the NST system has implications for building community resilience—providing access to well-sourced regional and national partner groups and foundations. Each NST not only connects trail users with the trail, but it links visitors to communities as well as connecting communities to each other in a regional network. As agency budgets and capacities for trail work have declined, the National Trails System has added new trails, and existing NSTs have been developed and evolved (Cervený et al., 2020b). We found that these trends have elevated the importance of relationships among local land managers, municipalities, trail-based organizations, community-based organizations, and community residents as central elements in the trails' critical stewardship infrastructure.

The health and well-being of trail communities is inextricably linked to healthy ecosystems and their management (Berkes & Ross, 2013). Trail communities exist within trail ecosystems. The incorporation of knowledge from different sources and scales encourages continual learning and adaptation (Berkes et al., 2000). NST governance is most effective when local knowledge of ecosystem dynamics and trail visitation patterns is gathered from local stewards. As we explore community stewardship activities, we can gain insight into the variety of ways that the presence of NSTs can foster community resilience, with many benefits for the trail and resources along the trail corridor.

These notions of sustainability, community resilience, and the role of community-based stewardship in enhancing resilience are important for consideration in the management of National Scenic Trails. NSTs extend across multiple land management jurisdictions, each with their own management goals and approaches to sustainability. Thinking about the NSTs as part of a social-ecological system, made up of diverse institutions operating at multiple levels to adapt and respond to change is a helpful framework. Future management of the NSTs would ideally embrace this broadened notion of sustainability to recognize the connection between healthy communities and healthy ecosystems. Efforts to expand tribal involvement in the NST network would expand stewardship opportunities to tribes with potential for enhanced resilience of tribal nations and improved management of trails. With such a large geographic scope and complex sociopolitical environment, the NSTs face challenges in meeting these goals. Until recently, there has been focus on primary NST partners and reliance on those partners to engage local partners and to uplift trail communities. A more proactive, systemic approach to considering the broad range of governing actors at multiple scales and recognizing the importance of community engagement may strengthen the viability of the trail for future generations.

Conclusion

National Scenic Trails are an important source of national pride, providing access to outstanding scenery, recreation opportunities, and venues for appreciating cultural and natural heritage. In addition to linking trail visitors with scenery, recreational and heritage

opportunities, NSTs link communities to national governance system of trail managers, administrators, and partners. NSTs vary in their physical characteristics, missions, and predominant use types, attracting both long-distance trekkers and day-hikers. NSTs transect multiple jurisdictions and land ownerships. An SES approach helps us to understand the multi-faceted nature of NST governance, where partnerships are coordinated at multiple levels with both governmental and non-governmental actors working together to steward the trails. NST administrators focus efforts on broad-based activities, NST managers care for the land directly, and NST partners engage volunteers in trail stewardship. Fostering community connections through “backyard stewardship” is integral to future sustainable management of the trail; and, trail stewardship is an essential tool promoting community resilience by introducing new social networks and enhancing local skill sets what will help communities weather future changes. Moreover, NST governance systems can enhance system resilience by incorporating knowledge from different sources and scales. Future engagement of tribes will expand co-management opportunities. While trail partners may come and go, communities and tribes live with the trails in their backyards. Recognizing and building on local connections through stewardship will enhance long-term sustainability of NSTs.

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