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Erratum: In the original publication of this article, two minor errors were present in the Cherokee syllabary, one in the Introduction and one in Figure 4. These errors were corrected on 10 May 2023.

Insight, part of a Special Feature on Collaborative Management, Environmental Caretaking, and Sustainable Livelihoods

Doing research together: *wasdi* (*Allium tricoccum*) plants guide dynamic research collaborations in Cherokee landscapes

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ABSTRACT. Research on harvesting culturally significant food plants can contribute to Indigenous food sovereignty. Relationships drive the process of research, which can affect research methodologies and outcomes. Promoting inclusion and equity in research relationships is necessary to reduce power hierarchies that often position conventional sciences above Indigenous knowledge systems. This paper employs a reflexive lens to consider important dynamics of an ongoing research collaboration between the Eastern Band of Cherokee Indians, federal agencies, and academic partners focused on the Cherokee food plantᎤᏩᏍᏗᎭ[transliterated as *uwasdiha* or *wasdi* and also recognized as ramps or *Allium tricoccum*]. An aim of our paper is to contribute to our collective understandings of Indigenous research methodologies (IRM) and collaborative research. Through iterative, place-based conversations and thematic analysis we identify and discuss our process engaging in trust building and relationality as co-authors. Key themes emerging from our work include the importance of (1) developing relationships when conducting collaborative research across multiple knowledge systems and (2) Indigenous food narratives that center traditional foods in research and relationships.

Key Words: *Allium tricoccum; collaborative research relationships; Indigenous research partnerships; Indigenous community driven research; Indigenous foodways; food sovereignty; uwasdiha; wasdi; ramps; relationality; trust building*

INTRODUCTION

ᎢᏤᎢ ᏗᎾᏛᏍᎩ ᏕᏗᏍᏕᎵᏍᎬᎢ ᎤᏐᏱ ᏂᎪᎯᎸ ᎨᎩᏍᏕᎸᎲᎢ ᎢᏗᏣᎳᎩ.

[Itse'i dinatvsgi dedisdelisgv'i usoyi nigohilv gegisdelvhv'i Iditsalagi.]

We helped the plants just like the way they have always helped us Cherokees.

ᎤᎪᎶᎯᏍᏗ ᏂᎨᏒᎾ ᎢᎦᏚᎵᏍᎪᎢ. ᎢᏓᎵᏏᎾᏗᏍᎪᎢ ᎡᎰᎢ ᎥᏍᎩ ᏂᏓᏛᏁᎰᎢ ᏕᏗᏯᎩᏍᎪᎢ.

[Ugolohisdi nigesvna igadulisgo'i. Idal'sin'disgo'i eho'i vsgi nidadvneho'i dediyagisgo'i.]

We wish to preserve and serve as stewards for these plants because we don't want these plants to disappear.

- Cherokee syllabary and phonetic text and translation by Tom Belt and Sami Chen

Knowledge is not imparted in isolation; it is interconnected with peoples and places. Such fundamental principles of relationality in knowledge production are highlighted as an integral aspect of research partnerships or collaborations with Indigenous communities (Wilson 2008, Nicholls 2009, Kimmerer 2012; Quiocho et al. *unpublished manuscript*). Research focusing on the intricacies of building and maintaining collaborative research relationships with Indigenous communities is needed to support impactful, long-term community research partnerships (Matson et al. 2021, Hakkarainen et al. 2022). Such work has the potential to shift collaborations away from extractive research practices. With that intent, this paper reflects on a dynamic research collaboration involving partners from the Eastern Band of Cherokee Indians (EBCI) Natural Resources Department, United States Department of Agriculture Forest Service (USDA FS), an EBCI community researcher, and a Stanford University PhD student. As we engage in collaborative research from our multiple positionalities, we seek to address the following questions guided by Indigenous Research Methodologies (IRM): How can we invite and nurture dynamic collaborative research partnerships amongst researchers from tribal communities, government agencies, and universities? What role can culturally important food plants play in advancing interdisciplinary research collaborations across knowledge systems?

Previous research establishes how historical governmental conflicts, and knowledge hierarchies have prevented partnerships between Indigenous and non-Indigenous peoples to achieve collaborative land management and ecological stewardship (e.g. Nadasdy 1999, Matsui 2015, Latulippe and Klenk 2020). Efforts to "integrate" Indigenous knowledge (IK) into conventional scientific knowledge often overlook historical power dynamics between Indigenous communities and researchers trained in conventional science, reinforcing Western cultural biases (Nadasdy 1999, Agrawal 2002, Moore and Hauser 2019). Moreover, people trained in conventional scientific and IK systems may have different opinions regarding which traditional ecological knowledge (TEK) is relevant (McGregor 2004, Akena 2012).

The track record of extractive research in Indigenous communities needs to be addressed in current and future collaborative efforts (Agrawal 2002, Latulippe and Klenk 2020). Regardless of intention, researchers have documented how additional problems regarding trust, misuse, and inappropriate extraction of knowledge have surfaced from more recent attempts at integrating Indigenous knowledge and conventional scientific knowledge systems (Nadasdy 1999, Moore and Hauser 2019). One of the most prevalent complaints is that the extraction of knowledge from Indigenous peoples is often synonymous with "doing TEK" in environmental and resource management decision making (McGregor 2004).

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Building on Indigenous Research Methodologies through ᏅᏩᏓᏂᎯ [*Uwasdiha*]

Through the process of two-eyed seeing, the strengths of IK and conventional science are drawn together with an intention of avoiding knowledge assimilation experienced by Indigenous communities in previous knowledge integration efforts (Akena 2012, Reid et al. 2021, Jacobs et al. 2022). Current models of two-eyed seeing are grounded in Indigenous scholarship presenting Indigenous research methodologies (IRM) as an alternative to conventional research methods (Moore and Hauser 2019, Reid et al. 2021, Jacobs et al. 2022). IRM leverage specific methods that fit an Indigenous paradigm (Smith 1999, Nicholls 2009). For example, knowledge is drawn through relationality, and relational accountability is fulfilled throughout the research process (Wilson 2008, Norgaard 2019, Littletree et al. 2020). Knowledge producers can follow IRM to establish legitimacy and trust, which enables people trained in Indigenous and conventional scientific knowledge systems and practices to connect in a way that addresses historical power dynamics and inequalities, minimizing further misuse of knowledge (Wilson 2001, Latulippe and Klenk 2020, Kovach 2021). Using IRM in research demonstrates a major intervention to correct for some of the historical and systemic problems addressed herein by Indigenous communities, researchers, and their allies (Smith 1999, Diver and Higgins 2014, Ban et al. 2018). When an IRM is applied with authenticity, knowledge systems are negotiated through a different set of protocols, norms, and power dynamics (Snow et al. 2016, Whyte 2018, Smythe et al. 2020).

Through this article, we will speak collectively and individually, reflecting on how our relationships and research collaboration have been shaped by our shared connections to the culturally significant Cherokee plant ‘ᏅᏩᏓᏂᎯ [transliterated: *uwasdiha* or *wasdi*], known commonly as “ramps” or in scientific literature as *Allium tricoccum* Aiton. In this paper, we use the Cherokee vernacular name “wasdi,” and engage with wasdi as a cultural food plant that inspires Indigenous food narratives and complex collaborations for research and management.

Advocating to restore wasdi populations, access, and cultural relationships with wasdi is one facet of broader EBCI tribal priorities and knowledge for food plants (Baumflek et al. 2022). Wasdi, recognized as a type of wild onion or wild leek, are a slow growing spring ephemeral, cherished for their robust flavor and significance as a cultural food (Fig. 1). Indigenous communities including the Cherokee, Haudenosaunee, Menominee, Anishnaabe, and Potawatomi have developed and continue to maintain long standing stewardship relationships with wasdi (Moerman 1998, Baumflek and Chamberlain 2019).

Cherokee people have long understood that the loss of these specific plants would negatively impact their health and that of their ecosystem (Tom Belt, *personal communication*). Therefore, Cherokee families living within wasdi’s geographic range have maintained generational relationships with wasdi, despite shifting land ownership and occupancy. Collaborative efforts advancing sustainable management of wasdi are crucial for Indigenous food sovereignty initiatives and informing federal regulations that shape harvesting access.

Fig. 1. Image of freshly harvested ramps. Photo by Sami Chen.

Despite differing conceptions of what constitutes sustainable harvesting practices, federal agencies and the EBCI both want wasdi patches to be healthy for future generations. As wasdi has become a popular specialty food in broader North American society, natural wasdi populations have been subjected to increased harvesting pressure and potential overharvesting (Nault and Gagnon 1993, Rock et al. 2004, Baumflek and Chamberlain 2019). In response to increased harvest pressure and need for sustainable harvesting, the EBCI Natural Resources Department, Tribal harvesters, and Tribal community wish to raise awareness and encourage traditional Cherokee harvesting practices as a potential solution to encourage sustainable practices because of the increase in popularity and commercial demand for foraged ramps.

Through our reflexive discussions on IRM, we provide insights on cross-cultural research collaborations, including intersections of Cherokee knowledge and conventional science. Our starting point is a shared recognition that research regarding wasdi and other plants significant to the EBCI is complicated by political conflicts and historical relationships with federal agencies. This history includes disagreements over the sustainability of wasdi harvesting, who benefits from this harvest, and how (Lewis 2012, Clabby 2016). Over the last decade, the EBCI, government agencies, and universities have been cultivating research

partnerships that center EBCI knowledge and priorities. We therefore discuss possibilities of research with cultural food plants including wasdi as a healing process that supports Indigenous food sovereignty and food narratives. With these intentions, we consider how relationships and resources that support the capacity to collaborate can influence research and policy outcomes.

Conceptual frameworks

Indigenous relationality and trust building

Though community-based research and ethnographic practices are well-established research methodologies, leveraging IRM and associated practices as interventions to unequal power structures is not embodied within most conventional scientific research (Smith 1999, Kovach 2021, McGreavy et al. 2021). We believe following IRM in collaborative research involving Indigenous communities, researchers, and allies can reduce substantial problems associated with research conducted by primarily non-Native scholars and institutions (Matsui 2015, Reo et al. 2017, Arsenault et al. 2019).

Therefore, we focus on three specific IRM practices: relationality, relational accountability, and trust building (Wilson 2008, Kimmerer 2011, Reano 2020). The concept of relationality acknowledges all people are in relationship with each other, nature, ancestors, future generations, and all living beings (Diver et al. 2019, Littletree et al. 2020, Williams 2022). Relational accountability extends responsibilities inherent to these relationships, which in a research process may include transparency, consideration of the implications of study design and interpretation choices, and reflexivity regarding roles (Snow et al. 2016, Reano 2020). In an Indigenous research paradigm, knowledge is drawn through relationality, and relational accountability is fulfilled throughout the research process (Wilson 2001, 2008, Diver et al. 2019). Trust building emerges through building relations, including providing accountability throughout a research process. Trust building is fundamental for successfully linking knowledge and action (Matson et al. 2016).

Drawing on Indigenous knowledges and conventional science

Following Ballard et al. (2008) we use the term "conventional science" as a synonym for "Western science" to avoid reproducing Western methods centered in research. In this use of the term conventional science, we are better able to engage with scientists not engaging in Indigenous knowledge systems or communities. Concepts of knowledge co-production described by transdisciplinary research in the field of sustainability offer some parallels with IRM, particularly regarding the importance of researchers expressing humility and practicing reflexivity in their process (Reano 2020, Steger et al. 2021, Hakkarainen et al. 2022). The empowering and transformative forms of knowledge co-production described by Hakkarainen et al. (2022) emphasizes an equal appreciation of knowledge systems and contributing knowledge producers. In this paper, we focus on engaging IRM as we are co-producing knowledge with Indigenous co-authors related to a culturally significant plant for an Indigenous community. When the Indigenous knowledge system is specific to Cherokee knowledge, we use the term Cherokee knowledge rather than IK or TEK.

Although conventional science and IK may both emphasize environmental stewardship, their processes and goals differ (McGregor 2004, Kimmerer 2012, Smythe and Peele 2021). Thus, overarching concepts and methods of knowledge production vary with the knowledge framework used for inquiry (Kimmerer 2000, Reo et al. 2017). Literature describing collaborations between IK and conventional science often highlights tensions that occur from different starting objectives in research straddling multiple knowledge systems (McGregor 2008, Matsui 2015, Smythe et al. 2020). In such cases, differing objectives and unequal power relationships hinder Indigenous narratives (AJS and CATG 2010, Reid et al. 2021).

Engaging "non-duality" between conventional science and Indigenous knowledge systems can be a challenge and/or a strength of collaborative research across multiple knowledge systems. Unequal power dynamics and different knowledge priorities remain key barriers to effective community collaborations (Matson et al. 2016, Steger et al. 2021). IK is typically not given equal recognition with conventional science in conservation initiatives, natural resource management, or environmental science training (AJS and CATG 2010, Gervais et al. 2017, Jacobs et al. 2022). Unequal power dynamics between knowledge systems has caused frustration in the existing process of IK validation and distillation (Nadasdy 1999, Agrawal 2002, Akena 2012). When engaging in collaborative knowledge production with Indigenous communities, sharing power with community members throughout the research and decision-making process is a crucial, yet often overlooked aspect of the work (Reano 2020, Thompson et al. 2020). Positioning community partners and Indigenous scholars as research collaborators and grounding research in IRM can enhance the quality and impact of research projects (Ban et al. 2018, Long and Lake 2018). We believe it is more appropriate that these knowledge systems stand shoulder to shoulder, thereby valuing insights each provides, rather than attempting to integrate them (Nadasdy 1999, Emery et al. 2014).

Understanding conditions necessary for researchers engaging in collaborative, cross-cultural research to both recognize and discuss differences in knowledge systems on a level playing field remains a key challenge (Cooperdock et al. 2021, Reid et al. 2021, Steger et al. 2021). For instance, starting from a conventional science framework, collaborators might discuss what ecosystem services to prioritize in a given system. This can lead to disagreements, in part, because one's definition of what the desired state of an ecosystem should be can vary, based on what knowledge frameworks are privileged (Kimmerer 2012, Walsey and Brewer 2018, Thompson et al. 2020). To compare ecosystem stewardship goals and processes from the perspectives of Indigenous, specifically Cherokee, knowledge systems and from conventional science frameworks, requires more intentional engagement with research and stewardship approaches across knowledge systems. This includes uplifting Cherokee perspectives that provide an additional starting place for discussion, which enables collaborators to then draw from the strengths of each knowledge system.

Indigenous Foodways and Food Narratives

Food brings people together. Indigenous foodways reflect communal culture, decolonization, and self-determination demonstrated through fishing, hunting, gathering, and agricultural practices (Adamson 2011, Mihesuah and Hoover 2019). Access to specific foods informs cultural identity,

relationships to land, and dynamics within communities. When evaluating Indigenous community access to culturally significant foods, research on Indigenous foodways emphasizes how all forms of community connections to food, including cultural, social, economic, and wellness must be considered (Hoover 2017, Pascua et al. 2017, Shade-Johnson 2018). Notions of Indigenous food sovereignty further reinforce social, cultural, and economic relationships built through Indigenous foodways and food sharing, which extends beyond frameworks focusing on legal access used in mainstream food sovereignty movements (Adamson 2011, Grey and Patel 2015, Martens et al. 2016). Although the concept of food sovereignty focuses on the rights of peoples to define and engage culturally appropriate food systems, Indigenous food sovereignty further emphasizes the sacred responsibilities and "culturally, ecologically, and spiritually appropriate relationships" inherent in maintaining food systems (Mihesuah and Hoover 2019:11). As stated by Huambachano (2019:1), "Food sovereignty for Indigenous peoples emphasizes collective and cultural responsibilities that arise out of a network of descent and kinship relationships."

Colonial practices that systematically dismantle Indigenous foodways continue to disrupt and harm Indigenous communities (Whyte 2016, Walsey and Brewer 2018, Dawson 2020). Among these disruptions are federal policies that have imposed limited opportunities for Indigenous peoples to be in relation with, and care for their lands and foods (Spence 1999, Catton 2016, Long and Lake 2018). These disruptions contribute to reduced quality of life in relation to spirituality, cultural identity, community relationships, medical health and well-being, and more (Middleton 2010, Ruelle 2017, Corntassel and Hardbarger 2019).

Thus, reawakening Indigenous foodways is integral to maintaining generational relations that embody lived knowledge with a place that can contribute to community health and well-being (Kamal et al. 2015, Gordon et al. 2018, Huambachano 2019). Reasserting Indigenous food narratives that center traditional foods in Indigenous lives, cultural identities, and well-being is one aspect of reawakening Indigenous foodways (Pascua et al. 2017, Dawson 2020). Research has established how the vitality of Indigenous food narratives and access to culturally appropriate food practices is fundamental to the survival of Indigenous communities and future generations (Middleton 2010, Gordon et al. 2018, Shade-Johnson 2018). We are witnessing this in practice as Indigenous communities, Indigenous scholars, and Indigenous chefs are collectively bringing a revival of Indigenous foodways and relationships with the land into being (Yerxa 2014, Kamal et al. 2015, Ruelle 2017, Sherman 2017, Norgaard 2019).

Case context: wasdi harvesting and research collaborations

Wasdi grow in forests with nutrient-rich, moist soils from Canada to Northern Georgia and Tennessee, and as far west as Missouri and Minnesota (Davis and Greenfield 2002). A spring ephemeral, wasdi are one of the first and most abundant plants to emerge in the spring, grow in the interval between snow melt and canopy closure, and senesce following canopy closure (Lapointe 2001). Rich, mesic cove forests within the southern and central Appalachian Mountains of the Eastern U.S. provide critical habitat for wasdi and many other species of cultural, medicinal, and economic importance (Elliott 2014, Chamberlain et al. 2019). In this article we focus specifically on wasdi habitat areas within traditional Cherokee homelands in what is now considered western North Carolina.

As a result of declining wasdi populations, some wasdi harvesters have expressed having a more challenging time searching for and legally harvesting wasdi. Many Indigenous communities experience similar difficulties with legal access to harvesting traditional plants (Baldy 2013). Today, legal wasdi harvesting policies vary throughout wasdi's range, including traditional Cherokee landscapes, depending on the current overseeing land management agencies. For example, the Nantahala National Forest currently allows five pounds of wasdi to be harvested for personal use by members of the public without a permit, and issues commercial permits for up to 40 pounds or more for a fee. No specific harvesting technique is required for these harvest allowance limits. In the Great Smoky Mountain National Park (GSMNP) and the Blue Ridge Parkway, which are units governed by the National Park Service, Department of the Interior, all wasdi harvesting remains illegal.

There are also traditional wasdi harvesting places in the GSMNP, which borders the present-day EBCI Qualla Boundary Trust Lands, and additional publicly managed lands. In an attempt to halt overharvesting and protect wasdi as a native plant species, the GSMNP responded to declining plant populations by placing a ban on all harvesting of wasdi on park lands in 2007 (Clabby 2016). The ban was based, in part, on overharvesting concerns raised by scientific studies examining impact of wasdi bulb harvests, a practice that involves removing the bulb, rhizome, and roots of the wasdi plant (Nantel et al. 1996, Rock et al. 2004; Rock 1996, *unpublished manuscript*). Following the ban of harvesting wasdi in the GSMNP, multiple EBCI Tribal members were charged with illegally harvesting wasdi and prosecuted. This led to the U.S. vs. Burgess court case in 2009, during which EBCI Tribal members addressed how the experimental harvest used in the studies informing the harvesting ban in the GSMNP did not include or account for Cherokee wasdi harvesting practices (Lewis 2012, Clabby 2016). Lewis (2012) questions why traditional harvesting of wasdi was banned in 2007 to begin with, citing that Section 36 in the Code of Federal Regulations 2.i(c)(i) allows for the acting park superintendent to designate species of plants, berries, and mushrooms for personal use or consumption that do not cause adverse impacts to park wildlife or resources.

In our discussions as co-authors, Tommy Cabe noted that Rock sought out EBCI community involvement to help inform the Rock et al. (2004) study. However, the GSMNP project leads did not form a research collaboration with the EBCI for multiple reasons, which we describe later in this paper. Thus, Cherokee traditional knowledge of wasdi harvesting was not included in studies conducted in the early 2000s. In response to the harvesting ban, and broader public, as well as EBCI Tribal interests in wasdi conservation on federal lands, the EBCI entered a research partnership with the USDA FS in 2015. One aim of the partnership is to study the effects of Cherokee harvesting practices on plant populations and ecosystems, as compared to non-Cherokee harvesting practices. Such research may support the restoration of gathering rights on the GSMNP, reflecting changes to the Code of Federal Regulations, 36 CFR.2.6. Importantly, this regulation was revised in 2016 by the National Park Service

(NPS) to respect tribal sovereignty and the government to government relationship between the United States and federally recognized tribes (Federal Register 2016).

Wasdi harvesting practices vary widely from collection of leaves only, to leaf and stems, to the digging of whole plants with roots and rhizomes. There is a diverse range of wasdi harvesting practices that can promote more sustainable harvesting. Cherokee community-based researchers offer insight on traditional Cherokee harvesting, which contributes to a broader desire to shift toward more sustainable harvesting practice. The positioning of EBCI Tribal members in wasdi research as leaders and collaborators led to the inclusion of traditional Cherokee informed harvesting practices in our studies. Cherokee people implement traditional wasdi harvesting with an intention to ensure the longevity of the plants. Thus, Cherokee people often review and discuss ethical harvesting and sustainability practices with one another to promote sustainable practices. A traditional Cherokee wasdi harvest involves cutting the wasdi in such a manner that leaves the roots and rhizome attached and in the ground. The intent of our ongoing collaboration is to center Cherokee knowledge and practice around wasdi harvesting, and to co-produce actionable knowledge that can inform management (Baumflek et al. 2022).

METHODS

Our team: a reflexive approach to exploring Indigenous research collaborations

We are a team of Indigenous and non-Indigenous collaborators, engaging in research from multiple sometimes overlapping positions, as EBCI Tribal community members, EBCI Tribal natural resource managers, federal agency scientists, and academic researchers. To describe specific roles, Tommy Cabe is the EBCI Tribal Forest Resource Specialist and the primary point of contact between the EBCI, USDA FS, and GSMNP. On behalf of our team, he sought EBCI executive and legislative support through the EBCI Tribal Council and EBCI Timber Committee to initiate and conduct this research project. Tyson Sampson joined this research project as a community researcher and consultant contracted by the EBCI Natural Resources Department to help facilitate and guide community interviews on harvesting practices and Cherokee plant knowledge. Michelle Baumflek is an ethnobiologist who initially joined this research project in 2016 as a postdoctoral scholar and became a permanent research biologist for the USDA FS Southern Research Station while this project continued. She has worked with Tommy Cabe and others to identify and implement research co-design approaches. In addition to conducting community interviews, Baumflek co-leads a field research project that studies the wasdi response to traditional Cherokee and non-traditional harvesting techniques to further understand the sustainability of wasdi populations, and population response to harvest disturbances. Sami Chen joined as a PhD student at Stanford University in Earth System Science by studying how the presence and harvest of wasdi influences the sustainability of soil fertility and the nitrogen cycle in mesic forest ecosystems. Our full research team comprises the co-authors of this paper.

We leverage autoethnographies, IRM, and four years of relationship building through fieldwork to address the complex dynamics of collaborative research for sustainable wasdi management. Autoethnography is a research practice in which the researcher may draw from a combination of personal memories, self-observation, self-reflective data, and external data to constitute forms of primary data (Chang 2016). This paper builds on focused discussions among co-authors, and interactive conversations following these sessions. When we recognized the dynamics of our research collaboration between tribes, government agencies, and universities was more nuanced than relationships typically described in the literature, our collective began these discussions to reflect on our experience. To learn from our existing research collaboration, we started with unrecorded group meetings and informal conversations as co-authors to discuss a conceptual framework and research questions for this paper.

We take a reflexive, relational approach to explore multiple aspects of our collaboration (Datta 2015, Hakkarainen et al. 2022). Reflexivity entails acknowledgement of similar and different perspectives on observations in relation to positionality of each researcher and the group as a collective (Siltanen et al. 2008, Steger et al. 2021). The practice of reflexivity may allow researchers to reach a common understanding and may empower Indigenous partners in collaborative research projects (Nicholls 2009). Siltanen et al. (2008) has described reflexivity taking place informally through the daily interactions of conducting research in each other's company, and we experienced a similar dynamic in our research collaboration. This approach involves routinely sharing individual observations and reflecting on differences and similarities within perspectives on observations and specific interpretations. We have followed this approach throughout our process working together as a research team over the last four years. Moreover, this approach is consistent with how EBCI harvesters often review and discuss ethical harvesting and sustainability practices with one another, an example of reflexivity in practice. This practice of reflecting on shared and differing insights on what is happening in the wasdi patch deepens our relationships to one another and with the plants.

We engaged in semi-structured dialogues focusing on the dynamics of our research collaboration. During the last four seasons of fieldwork, numerous conversations have informed the authors' respective understandings of their shared research relationship, which provided the seeds for this paper. From these conversations, we decided to focus on the dynamic process of collaborative research and the intersections of Cherokee knowledge and conventional science. We then recorded three semi-structured group conversations ranging from 1.5 hours to 3 hours in duration, focusing on the process of collaboration specific to wasdi field research with Baumflek, Cabe, Chen, and Sampson. The group recordings were transcribed by Chen, and key themes were shared back to the group, and incorporated into this paper. Sibyl Diver helped to mentor Chen regarding engaging with IRM literature, reflexive methodologies, and autoethnographic practice. Chen then crafted the initial theoretical framing following a literature review of IRM for this paper and solicited group feedback. From our group conversations and subsequent analysis, new key themes emerged, including the importance of Indigenous food narratives and Indigenous food sovereignty. We continued group meetings and unrecorded conversations throughout our writing and revision process periodically between 2021 and spring 2022. We collectively revised drafts and engaged with the documentation and analysis.

RESULTS AND DISCUSSION

Here we share our findings based on thematic analysis of our conversations as they relate to our research questions. These insights reflect the steps we are taking to address our efforts to promote collaborative research partnerships between tribes, federal agencies, and universities that are more inclusive and equitable. We discuss key themes that emerged in our conversations: building trust and relationality; research time frames; dormancy in collaborative engagement; language and place names; maintaining collaborations through food sharing and space sharing; and healing through Indigenous foodways. At times, we write in the collective voice, and at others, we write in an individual voice to ensure we can include multiple perspectives.

The relationship comes first: building trust and relationality

> *There's a knowing and there's an understanding. That's why we consult with each other, as human beings. Not as people with a certain shaped hat on. That's why we have Elders.* Tyson Sampson

Research outcomes are shaped by who is included in research collaborations and research methodologies (Gervais et al. 2017, Reano 2020). This work builds on long-term community research centering wasdi and other culturally significant plants (Baumflek et al. 2022; Dunlavey et al., *unpublished manuscript*). Building trust and relationality are key ingredients that allow for more meaningful collaborations and sharing of knowledge (Datta 2015, Diver et al. 2019, Littletree et al. 2020). Building inclusive and equitable relationships takes time, and is often not accounted for in research timelines (McGreavy et al. 2021). Specifically, relationships between tribal governments and federal agencies are strongly influenced by the quality of individual relationships on a person to person basis, for both parties (Diver 2016). Tommy Cabe shared that it is important to note that while researchers have frequently reached out to collaborate with the EBCI, it is the state of existing or developing relationships that affects how the tribal community responds to those requests.

The necessity of learning from previous wasdi research dynamics

> *Through our collaboration, I have reflected on how dynamic interpersonal relationships define the scope of a study, which then affects possible findings of a project and how those findings are leveraged. We would not be able to ask the questions we are asking without learning from previous wasdi research dynamics and the tremendously rich knowledge of wasdi produced over many generations by wasdi harvesters, aficionados, and researchers.* Sami Chen

The quality of the relationships between tribes and federal agencies can have a lasting effect on research efforts and environmental policy for decades (Diver 2016). The findings from earlier studies examining sustainable wasdi harvesting were not fully believed within the EBCI community, in part because the researchers were unable to build a relationship with community members or the EBCI Tribe. For example, Tommy Cabe shared that Janet Rock of the GSMNP sought out Cherokee community participation prior to the Rock et al. (2004) study. However, the existing relationship between the GSMNP and EBCI was not as extensive as it has become today. Thus, despite a request for Cherokee participation leading up to Rock et al. (2004)'s study, there was no tribal engagement in the project and no traditional Cherokee knowledge in their research methods. Tommy Cabe also acknowledged the EBCI Natural Resource department had less capacity to respond to this request at the time. To provide additional context, the previous leadership of the GSMNP and EBCI had a dissonant relationship; this situation may have influenced the implementation of the strict ban on wasdi harvests in the GSMNP, which is still in effect.

As described in a case analysis of Karuk Tribe-Forest Service relations in the Klamath Basin, Diver (2016) observes how the hierarchical, and shifting nature of leadership within federal agencies and tribes can be a point of vulnerability in collaborative management, which can impede progress toward repairing tribal-federal relationships (Diver 2016). For example, turnover in leadership and employees can result in unfinished projects and major directional shifts in collaborative philosophies (Diver 2016). Moreover, in academia there is inadequate support for Indigenous students pursuing degrees in natural resources (Gervais et al. 2017). In order to support progress in collaborative management, despite shifts in political regimes or individual relationships, institutions can take important steps toward codifying institutional frameworks and project commitments that maintain positive relationship building between tribes, federal agencies, and universities.

Building relationships

> *Having the conversation is the answer.* Tyson Sampson

The absence of Cherokee involvement in previous wasdi harvesting studies speaks to the importance of starting research by forming community relationships. For close to a decade, the depth of the relationship between the EBCI, USDA FS, and GSMNP has grown through commitment to active engagement. To address the sustainability of wasdi harvesting, the EBCI initiated a research relationship and Memorandum of Understanding agreement with the USDA FS in 2015 (described in Baumflek et al. 2022). This demonstrates the commitment on behalf of the EBCI, USDA FS, and GSMNP to reintroduce more sustainable thresholds of wasdi harvesting through collective knowledge sharing and collaborative research. Individuals from each agency, the EBCI, and universities have paved the way for this deeper relationship, which has allowed more meaningful collaborations, including a proliferation of collaborative opportunities, which each party intends to contribute to moving forward.

The importance of community perspectives and support for research also emerged during our reflections. For example, in 2017, EBCI Tribal Council heard a request from the Tribe's Natural Resources Department to allocate financial support for an environmental assessment on sochan harvesting in the GSMNP. ᎦᏣᏍᏂ [transliterated as sotsvna and also recognized as sochan or *Rudbeckia laciniata*] is a popular Cherokee food plant. Cabe and Sampson both stressed the power of EBCI Tribal member Becky Walker's testimony, in favor of the request, which emphasized the benefits for generations to come. The EBCI Tribal Council listened, and supported allocating $68,100 toward an environmental assessment in an agreement with the NPS (McKie 2017). In November 2018, the GSMNP released the Sochan Gathering for Traditional Purposes Environmental Assessment. Sochan is the first culturally significant Cherokee plant to be evaluated for harvesting access as a result of collaborations

between the EBCI, GSMNP, and USDA FS (Dunlavey et al., *unpublished manuscript*).

The shared appreciation for wasdi and desire to increase the abundance and health of wasdi patches between the EBCI, federal agencies, and universities drove the formation of our collaboration. In reflection, Cabe pointed out it is the cultural resource that is central to research collaborations: "who initiated isn't really the right focal point because these kinships have always been here and these relationships are living connections." Cabe continued that this is because "there has always been a kinship with the Indigenous people and the landscape. There is no difference in we Cherokee or Kituwah (our principle people) being present in this landscape embracing this kinship. This kinship, this isn't an initiation, this is a fluent pattern in the cycle of life." Drawing from both Cherokee knowledge and conventional scientific knowledge systems can guide wasdi population restoration and protection for future generations. Research partnerships between the EBCI Natural Resources Department, federal agencies, and academic partners emphasize working together to assess the ecological impacts of harvesting culturally significant plant species using traditional practices and the sustainability of native plant populations (this paper, Baumflek et al. 2022, Dunlavey et al., *unpublished manuscript*).

As researchers, building community relationships is essential regardless of degrees and institutional status

Early on in our collaboration, T. J. Holland (EBCI Cultural Resources Supervisor), who oversaw culturally related research collaborations with the EBCI Tribe, explained the importance of building community relationships and trust on a personal level before embarking on collaborative research with the EBCI. He emphasized that community members value relationality over degrees and institutional status. Researchers are encouraged to take the time to first build relationships and trust to be able to work with the EBCI. In acknowledgement of the kinship that the Cherokee knowledge system recognizes with landscape and all living beings, our actions are thus accountable to each of these relationships. In our work, we consciously sought to deepen our relationships to one another, the landscape, and all living organisms. In following the principle of relationality, the work we produce is understood to be held to such a standard as to either benefit or cause no harm to any of beings with whom we maintain a relationship. Everyone who has participated in this research project has engaged in trust and relationship building throughout the duration of the research project, on an individual and group level.

Developing relationality and reciprocity is a powerful skillset that exemplifies an Indigenous research framework (Kimmerer 2011, Datta 2015, Pascua et al. 2017). Building in time to foster and nurture relationships can be an overlooked, but essential aspect of research for all collaborations with any community (Castleden et al. 2012, McGreavy et al. 2021, Ortiz 2021). For example, Sampson chooses to begin a conversation on genealogy and family stories to first demonstrate relationality on a person-to-person level as an opening point to guide conversations that demonstrate relationality between the plant community and Cherokee peoples. Sampson uses his intimate knowledge of kinship and genealogy to open conversations on plant knowledge when engaging in community interviews. Relationality was even foundational to how we began our conversations reflecting about the research.

The group experienced substantial learning when we expressed our interests and care through deep listening, particularly around issues that were relevant to current issues happening in the community. In our experience, when researchers demonstrate an intimate level of care for the community, people sometimes respond with more excitement in sharing. In this research collaboration, Sampson demonstrates knowledge of relationality while providing an origin point for candid insights through talking about relatives and the old people. Sampson and Baumflek also noted that the people they interviewed about wasdi in a previous project expressed an appreciation and excitement in being able to share and to be heard. They reflected that community partners showed a desire to participate with the understanding that sharing may help to once again restore legal access to harvesting in Cherokee traditional homelands.

After several years of collaboration with Baumflek, Cabe, and Sampson, Chen reflected on sharing research insights with community members, "by being able to see how I fit within people's existing social and familial networks and their lived experiences, people expressed more interest in the research findings." For us, sharing food and our physical presence on the land transformed our ability to share and reflect on a deeper level. When we visit our field site to study wasdi, we center our intentions with a prayer and share food with one another at mealtime. Nourishing one another allowed us to build trust and to be open in our dialogues and reciprocal knowledge sharing (Fig. 2). Whereas sharing food and spending time in the wasdi patch together were essential in our process, the process of relationship building is unique to each collaboration (Fig. 3).

Fig. 2. When we visit the ramp patch, we nourish each other through food. Photos by Sami Chen.

Maintaining collaboration through food sharing and space sharing

> *When we spend time on the land together, we learn from each other. It all comes back to the relationships we've bonded when we were in the woods together… that's where you go to have the conversations. It's the ramp patch.*
> Michelle Baumflek

Around the world, food is a unifier. We found that studying food plants and eating studied food plants can reinforce commitment and connection. Sharing of food, in our experiences, helped facilitate an openness of thought and knowledge sharing. There

are many different elements that help to nourish one another and to maintain relationships that may be unique to or shared across communities and research partnerships. Indigenous food narratives and food sovereignty emerged as a more central focal point in our discussions than we initially expected. In fact, we found that place and food were key elements for successful interactions and maintaining our research collaboration as co-authors. Research related to the presence and harvest of wasdi extends deep relational ties that Cherokee families have had to the land and the plant for generations. We were further reminded of this throughout our research experience, as our field site locations for this project are on traditional Cherokee land and are identified by Cherokee place names. Much of Cherokee foodways knowledge centers on family food traditions, and the relationships between these food traditions, the land, and all our relations. Restoring access and relationality to wasdi is an act of food sovereignty. By being surrounded by and working with a culturally significant food plant, we were constantly building upon our connections to place and to each other. At the beginning of the field season, we always went to the wasdi patch together. Starting each field day with a prayer helped remind us of our intentions in embarking on this project.

Fig. 3. The ramp patch is our place of healing. It's where you go to have the conversations. Photo by Sami Chen.

Knowledge and wisdom sharing happens organically in specific contexts including meal time or while harvesting wasdi. Creating space for impromptu and spontaneous knowledge sharing depends on existing relationality, which takes time to develop. Community harvesting in a wasdi patch means more than extracting physical plant resources. Sampson reflected, "The process of harvesting and sharing wasdi conveys meaning that extends beyond the biophysical benefits of consuming wasdi." The process of visiting wasdi patches with friends and family members can be healing through the social and meditative aspects of tending to plant relatives. As with interdisciplinary communication in conventional scientific research, sharing knowledge openly with one another in the field works best through practice.

Drawing from Indigenous knowledge and conventional science in research collaborations

Differences in knowledge system practices

Currently, conventional scientific studies of environmental impacts inform legal access to harvesting (Baldy 2013, Long and Lake 2018, Purdy 2020). Chen pointed out that this is relevant to issues of uneven power relations between knowledge systems because even though harvesting practices informed by Indigenous knowledge (IK) may demonstrate a sustainable practice, conventional scientific studies may choose not to include or consider that IK has already demonstrated viability of a practice. When studies are conducted using conventional scientific methods to validate IK practices, this incorporates traditional knowledge into scientific literature, but may not contribute new meaningful knowledge to Indigenous communities (Agrawal 2002, Akena 2012, Matsui 2015). This is a challenge in natural resource management, and implicates the science and researchers conducting these projects as gatekeepers for knowledge production that can determine whether Indigenous community members can legally access traditional foods and harvest practices (Nadasdy 1999, Lewis 2012, Matsui 2015).

Reflecting on our research approaches, the team recognized that jointly identifying research questions and designs, as well as conducting the research collaboratively with the EBCI was essential to addressing power dynamics. When outside researchers join a call to action being led by EBCI, it ensures that co-led research projects have a tangible direct benefit, and relevant outcomes for the community. In this case, the co-led projects on wasdi are tied to a culturally significant plant and have the potential to influence resource availability and community access to wasdi. In this section, we reflect on multiple wasdi research projects that we are involved in. Baumflek noted that there is a different layer of welcome in this work, because of the understanding that you are working toward shared goals with invited tribal collaborations. To demonstrate the extent of the Tribe's support for wasdi research projects, the EBCI Tribal Council and Chief authorized paid time off for Tribal employees to participate in conversations with Sampson and Baumflek.

In our experiences, leveraging Cherokee knowledge and conventional science in concert with one another encourages a more holistic approach to addressing environmental focused research questions. Concurrently, we recognized that Cherokee knowledge and conventional science have different norms regarding the sharing of knowledge. Sampson reflected on knowledge system differences: "the objective of science is to be objective. The objective of natural resources is to promote conservation. The objective of Cherokee cultural practitioners is to pass on the lifeways to the next generation." Much of Cherokee traditional knowledge is shared and learned on a need-to-know basis (Tommy Cabe, T. J. Holland, Tyson Sampson, *personal communications*), which is a key contrast to data sharing norms in conventional science. The availability of data derived from collaborative research projects with tribes often considers cultural sensitivity in data sharing practices. When the EBCI engages in research collaborations, their agreement to participate is based on whether the research focus contributes to tribal priorities, such as the sustainability of cultural resources like wasdi.

Research time frames
Over the last decade, interactions between EBCI and federal agencies have moved toward greater commitment to relationship building, a crucial shift that has laid the foundation for ongoing research projects today. Similarly, researchers from academic institutions must also engage in the relationship building process when seeking collaborations. In addition, researchers conducting research in a community that they themselves are from, may need to navigate more complex tensions between academic and community expectations (Ortiz 2021). Our collaborative wasdi research suggests that when research teams engage reflexively in these research relationships, progress toward collective goals is more attainable.

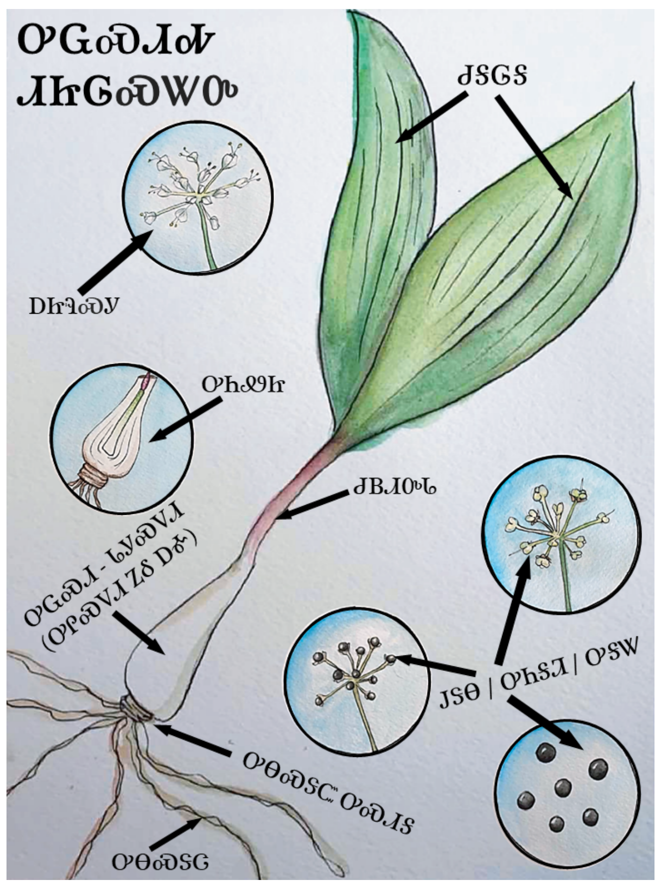
However, the process of relationship and trust building takes time, which sometimes is longer than the standard duration that research projects allot. This can be a systemic barrier to collaborative research projects as the timelines of community engagement are more open ended than formalized research agreements may suggest (Castleden et al. 2012, Matson et al. 2021, McGreavy et al. 2021). Moreover, the mismatch between academic research timelines and tribal timelines can limit the scope of community-based participatory research collaborations and projects (Castleden et al. 2012). Similarly, we found that navigating different timelines between the EBCI, USDA FS, and Stanford University collaborators was challenging. We observed that conducting research while accounting for different time frames of engagement was important because this affected co-author availability for project work. Extending beyond an inclusive and equitable relationship, each party within a collaboration must have the capacity for engagement in the research project. Even though researchers may reach out to collaborate, it is unlikely to happen if there is not an existing relationship or agreement to build a relationship. Tommy Cabe noted that the capacity of the EBCI to engage in research collaborations has expanded substantially over the last two decades.

Pandemic reflections: dormancy
Moreover, the capacity of collaborators, regardless of affiliation, still fluctuates due to personal and professional constraints. Our research collaboration was affected by the COVID-19 pandemic in multiple ways. In particular, finding adequate field support was challenging. We decided to reduce fieldwork during 2020 and Chen postponed an entire field season. Although these decisions were made out of an abundance of caution and respect for the community, we felt the presence or absence of Cherokee community involvement on the vitality of the project. Through this challenge, our shared understanding of the importance of our work sustained our commitment to collaboration.

Our team had to accept that there are pauses in community engagement in the research cycle. Although we initially planned to interview a wide spectrum of community members about community-based research collaborations and sustainable solutions, we adjusted to pandemic conditions by reflecting on our own situated experiences and co-authoring this article. When we adapted this project to pandemic constraints, we experienced a sense of dormancy in the energy flow of the research that accompanied less community engagement. Baumflek and Chen reflected on similarities between the dormancy in community participation in metaphor with the necessary dormancy of wasdi. We feel that extending this process to include more community narratives beyond the co-authors of this paper is a necessary future area of reflection.

The importance of Cherokee language and Indigenous place names
We found that learning Cherokee language and Indigenous place names can be a meaningful pathway to engage with both IK and conventional science frameworks. Throughout this project, we have worked in places with Cherokee place names. As Sampson reflected, "Cherokee language is the foundational philosophy that guides us and our work and protects our being and essence." We engage with the language to connect to the place and to our ancestors. In this project, we utilized Cherokee language at our field sites in our greetings, prayers, and biogeochemistry data logging whenever possible (Fig. 4). We find this practice is important because we believe language revitalization is a means of healing and advocacy for Indigenous food narratives and community well-being. Because wasdi are a part of a living Cherokee culture, there are an abundance of stories and practices connected to wasdi that go beyond the scope of this paper. Tyson Sampson shared the following:

Fig. 4. ᏩᏍᏗ ᏗᏥᎶᏍᏔᏅ [Wasdi ditsilostanv]. Artwork by Laetitia Vivian Chen Gladney and Sami Chen. Cherokee language translation by Tyson Sampson and Charles Taylor.



> *The language and food is what makes us Cherokee. As long as we call them wasdi, we are centering Cherokee narratives of kinship with the wasdi. When we say their name, it gives them identity and personhood that gives them standing in the relationship. All conscious beings, including plants, are seen as having a personhood. The act of harvesting wasdi embodies social, spiritual, and physical connections to the land.* ᏅᏂᏴᎬ *[Uniyegv], the word for plants, means they are awake. The plants help the health of the people [referring to the Cherokee oral stories of the Origins of Disease and Medicine]. And in exchange for helping the people, we ensure the longevity of these plants.*

These findings do not apply solely to our study. The importance of wasdi throughout its geographic range is exemplified through Indigenous place names. For example, the city of Chicago and the Winooski River in Vermont derive their names from wasdi, in the Miami and Abenaki languages, respectively (Baumflek and Chamberlain 2019). These names reflect deep cultural connections between the original stewards of these lands and places that cannot be erased. Though learning Indigenous languages is a challenging pursuit, it is worthwhile because they represent different perspectives that help expand our understanding of the world, (Tom Belt, *personal communication*). Moreover, Indigenous languages are essential for survival and adaptation as cultural knowledge is embodied and retained within place names and plant names (Turner 2014, Williams 2022). Renewing relationships with wasdi through language and harvesting practices is critical for passing on cultural knowledge to future generations.

Healing through Cherokee foodways and narratives

> *The plant nations have continually maintained sovereignty and with the thoughtfulness and consideration accompany good humans to cultivate their own self-determination. We need plants and plants need us for a better way for life.* Tyson Sampson

Much of Cherokee foodways knowledge centers on family food traditions, and the relationships between these food traditions, the land, and all our relations. There are thousands of stories about wasdi, and many other culturally important food species, that speak to an intricate vitality of kinship with the land, which has always been ingrained in the everyday lives of Cherokee peoples. By centering Indigenous food narratives of wasdi and other culturally important food species, we can uplift Indigenous knowledge and practices that have often been written out of existence in academic spaces and historical governmental policies (Adamson 2011, Shade-Johnson 2018). Through the conversations described in this paper, we allowed our connections with wasdi to guide us in uplifting Cherokee food narratives, through our daily interactions and research.

It comes as no surprise that not all research opportunities are met with praise. There is a spectrum of ways communities engage in the process of co-producing knowledge (Table 1 in Hakkarainen et al. 2022). When collaborating with Indigenous communities today, Sampson reflected that we need to remember the situational context of how the U.S. government has treated and mistreated Indigenous nations and how the positionality shift from enemy to collaborator is a major shift that does not come without growing pains and trauma that must be addressed (Spence 1999, Carroll 2015, Catton 2016). Policies including the Indian Removal Act, the Termination Act, and the Indian Reorganization Act intentionally broke down and ripped apart Indigenous relationships with land and with ecosystems that to this day have yet to be restored. Sampson expressed part of the healing will come from (re)asserting ownership over our own food narratives. "We need to have ownership of our own food narratives," Tyson Sampson said. He continued, "food is an aftertaste to the ongoing policies of assimilation and the 1934 Indian Reorganization Act."

Reawakening Cherokee food narratives is intricately tied with reestablishing Cherokee language, culture, stories, and viscerally reconnecting to the land and to each other (Carroll 2015, Shade-Johnson 2018). Restoring Cherokee harvesting rights goes beyond extraction of material goods, it also is about healing a reciprocal relationship and tie between Cherokee gatherers and the ecosystems as well as Cherokee gatherers with their families and communities (Carroll 2020). As Tommy Cabe shared, "when we go to these mountains, I don't look at it as a National Park. This land is not in a category, it is us. It is revisiting a DNA cellular connection through food, which is medicine. We are rekindling and reinvigorating the cellular needs in my body that are Cherokee. When I go to these landscapes to re-engage this cycle, it is a reunion. This is the spiritual cycle that cannot be measured through science." These collaborations are monumental in that they can facilitate and be a part of the restoration and healing of these sacred bonds between ecosystems and Cherokee peoples. Understanding these historical relationships between Indigenous communities, government agencies, and researchers is crucial (Spence 1999, Carroll 2015, Catton 2016, Schrack 2018). Researchers must consider the historical context of prior research relationships between tribes, agencies, and universities to establish new working relationships (Castleden et al. 2012, Matson et al. 2016, 2021).

Indigenous relationships to language, land, and foodways are three main relationships intentionally harmed through colonization, federal policies, and boarding schools (Middleton 2010, Robyn 2015, Purdy 2020). Our reflections pointed to the influence of historical policies and present-day (dis)connection to land amongst some community members. These policies have resulted in intergenerational traumas, Sampson reflected. The continued disconnection between Cherokee peoples and traditional foods perpetuates systemic injustices. Severing Indigenous community access to harvesting interrupts more than the consumption of a culturally significant food. Disrupting traditional foodways hinders access to traditional practices, culture and knowledge sharing, social dynamics, and the health of the people (AJS and CATG 2010, Martens et al. 2016, Mihesuah and Hoover 2019). Furthermore, "the recovery of the people is tied to the recovery of food, since food itself is medicine: not only for the body, but for the soul, for the spiritual connection to history, ancestors, and the land." (LaDuke 2005:210). Sometimes, making traditional food practices illegal can even interrupt the physical safety of tribal members in their traditional homelands (Robyn 2015, Purdy 2020, Oberholzer Dent et al. 2023). Sampson asserted that relationships between Cherokee harvesters and the land are a necessity, and prevention of these relationships contributes to lower quality of life for Cherokee

communities. We agreed that the vitality of Cherokee language and access to land through foodways needs to be acknowledged when engaging in research on culturally significant plants. Restoration of foodways and traditional harvesting relationships would help mitigate some of the long-term consequences that followed a shift in food culture and food access (Hormel and Norgaard 2009, Willette et al. 2016, Carroll 2020).

By harvesting, cooking, sharing, and eating traditional foods, Indigenous people are practicing cultural autonomy and self-determination (Baldy 2013, Walsey and Brewer 2018). Food is foundational in maintaining culture and sharing knowledge. Direct communal sharing of knowledge regularly happens through mealtime, and wasdi ties into that directly as a continuation of culture. Baumflek reflected that the ability to engage in the sustainability of harvesting practice and foodways is an act of food sovereignty. The nature of these relationships to harvesting relationships is more complex than acknowledged by legal harvesting policies (Long and Lake 2018, Walsey and Brewer 2018). Restoring harvesting rights allows communities to be able to nourish themselves and all their relations. Restoring traditional Cherokee foodway practices is a concrete way to rebuild reciprocity and relationships with each other, the land, our histories, and cultures. This realization of the importance of foodways in healing relationships is integrated into our research practice. Baumflek noted bringing and sharing food has always been a key component to our collaboration. We are studying an important food plant together. We are eating those plants together, and intentionally taking time when we are out working together to experience that bonding over food.

CONCLUSION

In order to reorient the power hierarchy that positions conventional science, federal agencies, or academic institutions above IK systems and the EBCI community, we reflected on the importance of (1) recognition of Cherokee knowledge as an essential knowledge system and (2) involvement of the EBCI community as leaders and collaborators in research initiatives. Cherokee priorities and knowledge need to lead the way on these initiatives. In the case of this research collaboration, our team has intentionally followed IRM principles of relationality, relational accountability, reflexivity, and trust building. In our group discussions, we found food, language, and spending time on the land emerged as key themes that support community engagement and sovereignty. Through interacting in shared fieldwork and subsequent reflections, we find that creating opportunities and space for Cherokee community driven research is one part of the solution to addressing challenges to collaborative research, including historical governmental conflicts and knowledge hierarchies. Our article provides insights on how collaborative research engages with Cherokee knowledge and conventional science to advance Indigenous food narratives and food sovereignty. While we reflect on the dynamics of our individual research relationships, we recognize they are more impactful when aligned with codified institutional relationships. Research partnerships that broaden community recognition, opportunities for EBCI-led research, and possibilities for EBCI research centers can be meaningful pathways to continue the relationship between the EBCI, federal agencies, and universities. This includes elevating and supporting a spectrum of community voices including Elders, youth, cultural practitioners, and researchers who are tribal members in research partnerships and co-authorship opportunities.

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Data Availability:

Data not available for ethical restrictions. Proprietary knowledge is only shared with the consent of the EBCI, as such supporting data is not available to be shared publicly.

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