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Indigenous Food Sovereignty in North America

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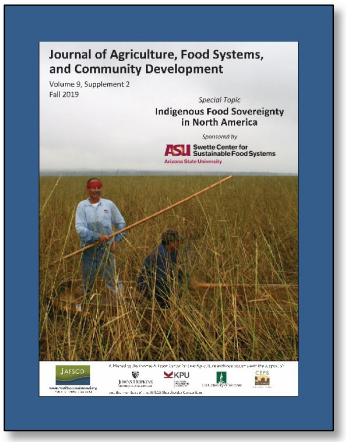
On our cover: Members of the White Earth Nation (Ojibwe) in Ogema, Minnesota, harvest manoomin (wild rice) in the fall. One tribal member poles the boat through the rice while another uses "knockers" to drop the rice into the canoe. *Photo copyright © 2009 by Duncan Hilchey.*



Indigenous Food Sovereignty in North America
Sponsored by the **Swette Center for Sustainable Food Systems at Arizona State University**

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Arizona State University

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IN THIS ISSUE
DUNCAN HILCHEY

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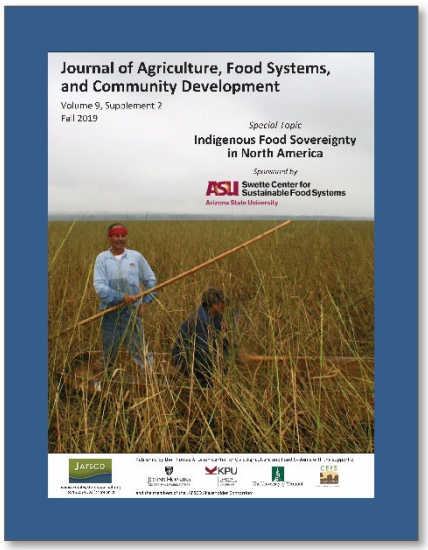
Indigenous food sovereignty in North America



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This special issue draws attention to the roles and responsibilities of knowledge producers, knowledge keepers, and food systems actors in managing and enhancing access to culturally appropriate food produced through ecologically sound and sustainable methods in Indigenous communities in North America. Our sponsor for this issue is the Swette Center for Sustainable Food Systems at Arizona State University. With Executive Director Dr. Kathleen Merrigan (former U.S. Department of Agriculture deputy secretary and chief operating officer), the Swette Center has a global mission to create and disseminate knowledge about food systems that drives economic productivity and social progress.

In our call for papers, we sought empirical, theoretical, or pedagogical contributions from academics and practitioners that inform Indigenous food sovereignty policy and practice. We encouraged manuscripts documenting interagency and/or nation-to-nation collaboration, as well as collaboration among public, nonprofit, and private enterprises, and scholar/practitioner co-partners. We hoped for submissions that closely examined processes as well as those that interrogated failed or struggling programs or policies.

In the end, our call yielded 13 peer-reviewed papers, four in-depth commentaries, and three *Voices From the Grassroots* essays, covering a range of themes from ongoing struggles with vestiges of North America's colonial history to powerful stories of reclaiming food sovereignty through reinvigorating or rediscovering traditional and sacred foods and foodways. We're pleased to share this range of projects and perspectives with you, our readers. Along the way, we are not only introduced to remarkable people and projects, but also to a

On our cover: Members of the White Earth Nation (Ojibwe) in Ogema, Minnesota, harvest manoomin (wild rice) in the fall. One tribal member poles the boat through the rice while another uses "knockers" to drop the rice into the canoe. *Photo copyright © 2009 by Duncan Hilchey.*

variety of Indigenous research methodologies borne out of collaborations between Indigenous and non-Indigenous scholars, activists, and university staff.

We are grateful for the guidance and leadership of our editorial team for this special issue, including:

- Dr. Andrew Berardy, Postdoctoral Research Associate, Swette Center for Sustainable Food Systems, Arizona State University
- Dr. AL Anderson-Lazo, Director of Research and Evaluation, Rural Coalition
- Dr. John Phillips, Executive Director, First Americans Land-Grant Consortium (FALCON)
- Dr. Janie Simms Hipp, CEO, Native American Agriculture Fund
- Dr. Elizabeth Hoover, Executive Committee, Native American Food Sovereignty Alliance, and Manning Associate Professor of American Studies at Brown University
- Dr. Christopher Wharton, College of Health Solutions, Arizona State University
- Dr. Bryan Brayboy, Professor of Indigenous Education and Justice, School of Social Transformation, Arizona State University

We thank all the JAFSCD reviewers who assisted by not only reviewing but in some cases mentoring a number of early-career and non-academic authors in this issue. I would also like to extend a special thanks to Dr. Keith Williams, First Nations Technical Institute (Canada), for his over-and-above contribution to the issue through reviewing and mentoring authors. A complete list of JAFSCD's reviewers can be found at https://foodsystemsjournal.org/index.php/fsj/jafscdreviewers.

Please note that a number of authors have used the terminology for tribal names, foods, places, etc., according to tribal or stakeholder preferences. We have done our best to follow these preferences in a respectful way. Any errors are our own.

We begin this special issue with the always insightful column from **John Ikerd,** entitled *Indigenous Wisdom and the Sovereignty to Eat Meat,* in which he explores the role of meat in the diet of Indigenous North Americans, in sustainable agroecosystems, and in personal dietary choice.

Next are three **Voices From the Grassroots** essays. Voices essays share critical experiences from practitioners' and activists' points of view and are intended to inform the work of organizational peers as well as the research community. **Nora Frank-Buckner** and **Northwest Tribal Food Sovereignty Coalition Members** offer the *Northwest Tribal Food Sovereignty Coalition: An Intertribal Collaboration.* **Rhonda Bowers, Pat Harris, Clarisse Harris, Kathryn Lone Fight,** and **Ina Weed** author *Reviving and Reclaiming Our Native Food System: Leadership Experiences of a Research Project's Community Advisory Board.* **Zachary Paige** writes *White Earth Food Sovereignty Initiative: What Food Sovereignty Looks Like on the Sovereign Nation of White Earth.*

Next up are four in-depth commentaries. **Vanessa García Polanco** and **Luis Alexis Rodríguez-Cruz** write *Decolonizing the Caribbean Diet: Two Perspectives on Possibilities and Challenges.* **K. Nicole Wires** and **Johnella LaRose** present *Sogorea Te' Land Trust and Indigenous Food Sovereignty in the San Francisco Bay Area.* **A-dae Romero-Briones** offers *Fighting for the Taste Buds of Our Children.* **Mary Beth Jäger, Daniel B. Ferguson, Orville Huntington, Michael Kotutwa Johnson, Noor Johnson, Amy Juan, Shawna Larson, Peter Pulsifer, Tristan Reader, Colleen Strawhacker, Althea Walker, Denali Whiting, Jamie Wilson, Janene Yazzie, Stephanie Russo Carroll,** and the **rest of the Indigenous Foods Knowledges Network** present *Building an Indigenous Foods Knowledges Network Through Relational Accountability.*

At the core of this special issue are 13 peer-reviewed papers that take deep dives into a wide range of strategies to understand and reclaim Indigenous food sovereignty in North America.

We begin with a paper by **Tony N. VanWinkle** and **Jack Friedman,** who reveal how the opacity and bureaucratic posturing of two federal agencies are discouraging Native American farmers from receiving their fair share of assistance in *Between Drought and Disparity: American Indian Farmers, Resource Bureaucracy, and Climate Vulnerability in the Southern Plains.*

In *Restorying Northern Arapaho Food Sovereignty,* Arapaho researcher **Melvin Arthur** and colleague and White ally **Christine Porter** correct the historical record of a tribal community's recent and sudden loss of food sovereignty—and its struggle to regain it.

In *Our Hands at Work: Indigenous Food Sovereignty in Western Canada,* **Tabitha Robin** presents stories that explore in-depth traditional foodways, identifying history, connection to the land, relationships, and cultural identity as keys to understanding Indigenous food sovereignty.

Next, **Charles Z. Levkoe, Lana Ray,** and **Jessica Mclaughlin** explore the challenges faced by a food policy council in addressing food sovereignty for all residents in *The Indigenous Food Circle: Reconciliation and Resurgence through Food in Northwestern Ontario.*

In *A Holistic Definition of Healthy Traditional Harvest Practices for Rural Indigenous Communities in Interior Alaska,* **Krista M. Heeringa, Orville Huntington, Brooke Woods, F. Stuart Chapin III, Richard E. Hum, Todd J. Brinkman,** and **Workshop Participants** provide a case example of how food sovereignty can be effectively informed by the deep engagement of community stakeholders.

The development of a new undergraduate degree program in Indigenous food systems based on traditional Haudenosaunee principles and informed by transformative learning theory is the focus of *Good Words, Good Food, Good Mind: Restoring Indigenous Identities and Ecologies through Transformative Learning,* by **Keith Williams** and **Suzanne Brant.**

Using their novel "sovereign storytelling" method, **Rachael Budowle, Melvin L. Arthur,** and **Christine M. Porter** investigate the value of home gardening across generations in *Growing Intergenerational Resilience for Indigenous Food Sovereignty through Home Gardening.*

Jennifer Sowerwine, Daniel Sarna-Wojcicki, Megan Mucioki, Lisa Hillman, Frank K. Lake, and **Edith Friedman** reflect on their community-based participatory research project to develop a healthier, more resilient, and culturally relevant tribal food system in *Enhancing Food Sovereignty: A Five-year Collaborative Tribal-University Research and Extension Project in California and Oregon.*

In *Contribution of Wild Foods to Diet, Food Security, and Cultural Values Amidst Climate Change,* **Erin Smith, Selena Ahmed, Virgil Dupuis, MaryAnn Running Crane, Margaret Eggers, Mike Pierre, Kenneth Flagg,** and **Carmen Byker Shanks** find that low-income residents of one Indigenous community report that climate change is already impacting their ability to secure the wild foods that are critical to supplementing government food support.

Next, **Staci Emm, Jessica Harris, Judy Halterman, Sarah Chvilicek,** and **Carol Bishop** present the results of their nutrition education project to increase food security for children in *Increasing Fruit and Vegetable Intake with Reservation and Off-reservation Kindergarten Students in Nevada.*

In *Kaʔtshatstáʌsla: "Strength of Belief and Vision as a People"—Oneida Resilience and Corn,* **Lois L. Stevens** and **Joseph P. Brewer II** present a case study of how a remote Oneida tribal community is rediscovering its traditional spiritual connection to corn.

In *Eating in Place: Mapping Alternative Food Procurement in Canadian Indigenous Communities,* **Jennifer Sumner, M. Derya Tarhan,** and **J. J. McMurtry** put the spotlight on local projects such as community gardens, greenhouses, and co-operatives that are being initiated redress Indigenous food insecurity.

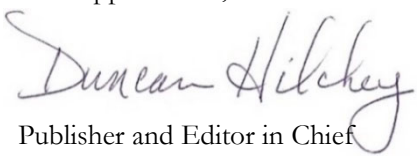
Finally, wrapping up the issue are **Shirley Thompson, Keshab Thapa,** and **Norah Whiteway,** who use

innovative land-use map biographies to map an Indigenous community's wild food harvest locations in *Sacred Harvest, Sacred Place: Mapping Harvesting Sites in Wasagamack First Nation.*

With this issue, we hope to begin a long and fruitful exploration into the food sovereignty of Indigenous peoples around the world. There is much learn about the challenges faced by communities who are using creative means to cast off the cultural shackles of colonialism, while simultaneously enriching all our lives with a profound understanding of the connection of foodways to culture, spirituality, and long-term community resilience. What we learn from the past and present struggle of Indigenous people can inform a resilient future for all of humankind.

We welcome the ongoing submission of research papers and *Voices From the Grassroots* essays on Indigenous food sovereignty, especially those from tribal communities, activists, researchers, and non-Indigenous collaborators.

With appreciation,



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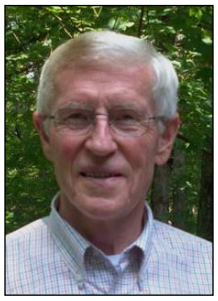

The Economic Pamphleteer
John Ikerd

Special JAFSCD Issue
Indigenous Food Sovereignty in North America
sponsored by
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Arizona State University

Indigenous wisdom and the sovereignty to eat meat

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Growing concerns about global climate change have rekindled an age-old controversy about eating meat (Carrington, 2018). Animal agriculture is frequently indicted as a major contributor to greenhouse gas emissions. However, animal agriculture is not without defenders, including those who claim that holistically managed livestock grazing systems could actually "reverse climate change" (Savory, 2013). Various studies suggest that the environmental impacts of food animal production differ significantly among management systems—particularly confinement versus pasture-based systems (Koneswaran & Nierenberg, 2008). Due to its complexity, this controversy will not likely be resolved by science. Instead, the wisdom of Indigenous peoples may prove more useful in deciding whether to eat or not eat meat.

The Indigenous peoples of North America were not of a single mind or custom in their reli-

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*Why an **Economic Pamphleteer?** Pamphlets historically were short, thoughtfully written opinion pieces and were at the center of every revolution in western history. I spent the first half of my academic career as a free-market, bottom-line agricultural economist. During the farm financial crisis of the 1980s, I became convinced that the economics I had been taught and was teaching wasn't working and wasn't going to work in the future—not for farmers, rural communities, consumers, or society in general. Hopefully my "pamphlets" will help spark the needed revolution in economic thinking.*

ance on other animals for their food. Those living in the eastern part of what is now the United States relied more on plants for food—particularly the "three sisters," corn, beans, and squash (Laws, 1994). They domesticated and cultivated corn, as well as other crops; corn remained their staple food source. Wildlife provided only a secondary source of sustenance. Indigenous peoples of the western plains, where the climate was less amenable to crop production, relied more on animals for food, particularly the buffalo. Fish and wildlife were major components of diets in northern regions of the continent, where crops were difficult or impossible to grow.

The role of animals in the Native American and First Nation diet increased significantly after Europeans brought horses and then guns to North America. Horses allowed the tribes on the Great Plains to hunt buffalo more effectively, reducing their reliance on the gathering of native plants. Guns increased the efficiency of hunting both large and small game among all tribes, reducing their reliance on farming and native crops. Even though meat may have been a major part of the diet of most Native Americans for only a couple hundred years, they apparently had no reluctance to include meat in their diets wherever and whenever it was practical for them to do so.

The Indigenous people of North America apparently were of a common mind regarding their fundamental relationship to other living and nonliving things of the earth. The natural world or environment was not viewed as separate or separable entities but as a whole that included humans and the other animals. As intelligent, thoughtful beings, they felt a moral responsibility to respect and care for the other elements of the natural world—including other animals. Many indigenous people believed and continue to believe that animals have spirits and that animals give their bodies to provide food, fur, and other materials for humans. The taking of an animal's life was and is a sacred act (Indigenous Corporate Training, Inc., 2016).

Native Americans were also careful and respectful of the natural lifecycles of the animals with whom they shared the earth. They adopted customs to prevent overfishing, overhunting, and overharvesting. They hunted, fished, and collected what was needed to sustain their families, tribes, or clans—but no more. Every part of the animal was used, and in many cultures there were accompanying celebrations and rituals of appreciation. The killing of animals beyond the need for food was practiced only by the few who adopted European values and killed animals to sell or trade. A prime example of European economic influence is the fate of the American buffalo.

Today, the ecological philosophy of Indigenous people is perhaps best preserved in the concept of food sovereignty. The global food sovereignty movement was initiated in the mid-1990s by Via Campesina, a *peasant-led* organization, bringing together small-scale farmers, farmworkers, women farmers, and indigenous people to resist agricultural industrialization. Food sovereignty was defined as the "people's right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Carney, 2012). The global food sovereignty movement suggests that the question of eating meat is matter of personal choice or at least should be culturally and locally determined.

The Indigenous Food Systems Network defines food sovereignty in similar terms. Relying on "Indigenous food related knowledge, values and wisdom built up over thousands of years" (Indigenous Food System Network, n.d., para. 2), Indigenous food sovereignty is defined by four key principles: (1) Sacred or divine sovereignty—Food is a gift from the Creator, and the right to food is sacred; (2) Participatory—Active involvement in cultural harvesting strategies; (3) Self-determination—Meet individual needs for culturally adapted foods; (4) Policy—Reconcile Indigenous food values with laws and the mainstream economy. Obviously, killing and eating animals is a part of many Indigenous cultures. Killing animals and eating meat would then seem to be a sacred right that is left to the discretion of individual tribal cultures or to self-determination.

This Indigenous wisdom of eating meat is also consistent with the requisites of sustainable agriculture. Agricultural sustainability depends on efficient, resilient, regenerative living agri-food

systems. In *efficient* agroecosystems, living species consume the secretions, embryos, or dead carcasses of other living species, turning redundancy and wastes into life-giving food. Animal species add *resilience* to agroecosystems, increasing their ability to endure shocks and disruptions—such as climate change. Animals also play a vital role in cycles by which solar energy is sequestered, cycled, and recycled by animals and plants, *regenerating* the diversity of life essential for efficiency, resilience, and sustainability. Every healthy natural ecosystem includes species that perform the basic functions of animals in a sustainable agroecosystem.

Sustainable agroecosystems, like Indigenous cultures, are individualistic and site-specific. The diversity of living organisms needed to sustain life and sustenance in one geographical and cultural ecosystem may be quite different from the diversity needed in another. Thus, the role of animal agriculture may be quite different, and of greater or lesser importance, in different sustainable agroecosystems. In some agroecosystems, species other than animals may provide the diversity essential for sustainability. Basing individual decisions to eat or not eat meat on sustainability, food sovereignty, or Indigenous wisdom leads to much the same conclusions.

The food choices confronting North Americans today are quite different from those that confronted Indigenous peoples in the past. Today, animals are confined, abused, and slaughtered with little apparent concerns for their life or spirit. If all life is connected, what is done to any life is done to the whole of life, including human life. Respect for human life then requires respect for all life, plants as well as animals—every life. Killing should never become comfortable, because all life is sacred. Life requires taking of life or taking from life, but life does not require irreverence or disrespect for the life taken—any life. Meeting the challenges of climate change, food sovereignty, and sustainability will require a renewed respect for life. Whether that includes eating meat will remain a matter of culture, conscience, and personal choice.

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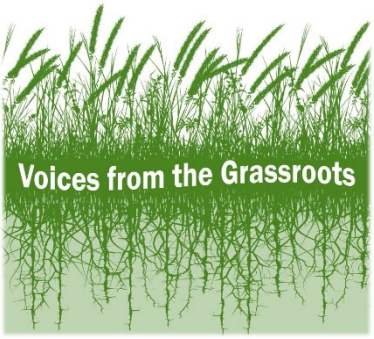
Northwest Tribal Food Sovereignty Coalition: An intertribal collaboration

Special JAFSCD Issue

Indigenous Food Sovereignty in North America

Swette Center for Sustainable Food Systems
Arizona State University



Nora Frank-Buckner [a] *
WEAVE-NW project at the Northwest Tribal Epidemiology Center

in collaboration with the Northwest Tribal Food Sovereignty Coalition [b]

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Abstract

American Indians and Alaska Native people experience large disparities in the prevalence of preventable, diet-related diseases directly associated with the lack of access to healthy, traditional food. The Northwest Tribal Food Sovereignty Coalition, a tribal-driven network, is an opportunity for tribes, tribal organizations, and allied partners to organize efforts that are driven by cultural revitalization, community empowerment, and the use of innovative strategies to improve the health of the people and reclaim food sovereignty. This reflective essay aims to discuss the process of the development, recruitment, and activities of this newly formed coalition.

Keywords

Tribal Food Sovereignty, Food Systems, Coalitions, Traditional Foods, American Indian/Alaska Native Nutrition

Introduction

There is an epidemic of preventable, diet-related diseases directly associated with the lack of access to healthy, traditional foods, and medicines. American Indian and Alaska Native people (AI/AN) experience higher rates of chronic diseases, such as type II diabetes and cardiovascular disease, compared to other American populations (Indian Health Service, 2018). The cause of this is complex and multifaceted. It is rooted in colonization and the removal of tribal people from their homelands, often to areas that are less rich in natural resources. Federal policies throughout history have affected the way AI/AN people interact with the food

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[b] The Northwest Tribal Food Sovereignty Coalition is a tribal-driven network encompassing 27 tribes, 17 external organizations, and three working groups. The NTFSC is facilitated and coordinated by the WEAVE-NW (Wellness for Every American Indian to View and Achieve Health Equity) project.

system. Prior to colonization, AI/ANs obtained their food through hunting, fishing, and gathering. In the Northwest, traditional AI/AN foods consist of a diverse range of plants and animals such as wild berries, roots, wild greens, salmon, shellfish, elk, and deer, and clean water from streams rich in minerals. The traditional native foods are rich in nutrients and free of the unhealthy preservatives and additives common in highly processed foods, which are often the only choices available at small grocery stores and markets near tribal communities.

For decades, tribes in the Northwest region (Idaho, Oregon, and Washington) have implemented food sovereignty and traditional food projects to reclaim their traditional food knowledge and traditional food system to improve the health of their communities. The Northwest Tribal Food Sovereignty Coalition (NTFSC) provides an opportunity to organize these efforts to achieve food sovereignty and optimal health. Food sovereignty can be defined as the right of indigenous nations to define their own diets and shape food systems that are harmonious with their spiritual and cultural beliefs, knowledge, and values (Well for Culture, 2018). Food sovereignty is about tribal communities providing food to their members through culture, traditions, policies and/or law (local, state, or federal), and economic development (Echo Hawk Consulting, 2015).

The NTFSC is facilitated and coordinated by the WEAVE-NW (Wellness for Every American Indian to View and Achieve Health Equity) project at the Northwest Tribal Epidemiology Center (NWTEC) and is funded through a cooperative agreement with the Centers for Disease Control and Prevention (CDC), under the Good Health and Wellness in Indian Country initiative (CDC, 2016). The NWTEC is one of 12 national Tribal Epidemiology Centers and serves the 43 federally recognized tribes in Idaho, Oregon, and Washington. NWTEC is responsible for collecting tribal health status data, conducting evaluations, doing epidemiologic surveillance, and assisting tribes in identifying local priorities for healthcare delivery and health education programs (Northwest Portland Area Indian Health Board [NPAIHB], n.d.-a).

From 2015 to 2017, WEAVE-NW provided 14 subawards to Northwest tribes. Many of these tribes focused on the development or strengthening of community gardens, traditional food programs, food policy, partnerships, sustainability, and food sovereignty assessments. With shared aims of food system change approaches, the tribes requested more opportunity for intertribal collaboration to share resources and tools.

Following the 2016 Native American Nutrition conference in Prior Lake, Minnesota, WEAVE-NW staff and tribal subawardees debriefed following the breakout sessions and discussed what would be useful moving forward. These early conversations led to the creation of the NTFSC, with additional support being gathered from community leaders, youth, elders, and tribal employees at other meetings, trainings, and events in the Northwest region. One tribal member expressed, "There are so many tribes that have developed curriculum and resources [around traditional foods], it would be nice to share these with each other so we don't have to recreate the wheel."

WEAVE-NW serves as the backbone organization for the facilitation and coordination of the NTFSC. Forming the coalition currently are 27 tribes, 17 external organizations, and three working groups. The members come from a wide range of professions and backgrounds, including elders, tribal leaders, garden coordinators, traditional food educators, health professionals, and extension agents. Each of these members brings regional- or community-level expertise, leadership, and skill sets relevant to the region.

In the early stages of development, a strategic action planning meeting was held. The NTFSC identified two areas of focus for their first year: (1) to develop a media campaign on the importance of traditional foods (see the logo, Figure 1), and (2) to host a regional gathering for a cultural and knowledge sharing of traditional foods, medicine, and culture. These two focus areas served as a starting point for two of the three working groups (the media and gathering workgroups). Tribal and organizational partners self-selected into each working group and began making an action plan to carry out these activities.

Figure 1. Northwest Tribal Food Sovereignty Coalition Logo Representing the Diversity of Plant and Wildlife of the Region

After the initial meeting, a leadership workgroup met via conference call and in person to brainstorm the vision, mission, and values of the coalition. Although still in development, the NTFSC's working mission is to "reclaim our indigenous knowledge to maintain and improve our health and quality of life for ourselves and future generations." A final version of these will be published on the NPAIHB website under the NTFSC page (NPAIHB, n.d.-b).

The Media Workgroup has participated in an initial survey to brainstorm ideas for a target audience and main message. There is more work to be done to narrow down these ideas. WEAVE-NW plans to hire a design team to help the Media Workgroup move forward with the planning and implementation of a marketing strategy.

One of the main highlights of this first year was the planning and implementation of the NTFSC's gathering. The gathering was held in fall 2018 on the Port Madison Indian Reservation of the Suquamish Tribe. Over 160 participants from across the region attended this event, including youth, elders, community leaders, tribal leaders, tribal and nontribal organizational partners, and tribal staff.

It was important to the Gathering Workgroup to include presentations on community-level projects addressing food sovereignty. Specifically, the chairman of the NPAIHB, Andy Joseph (of The Confederated Tribes of Colville), was invited to give a keynote presentation. The chairman presented on his tribe's First Foods, including information on the restoration of salmon runs, the recovery of lamprey, and the reintroduction of wildlife. In addition, the workgroup invited three additional communities to present on their work in the form of a panel. The agenda also included a traditional foods meet-and-greet (where participants showcased various traditional foods and medicines), skill-building break-out sessions, a "Native Chopped" cooking competition (Figure 2), and a traditional dinner with salmon, shellfish, and other traditional foods (Figure 3).

Figure 2. Plated Food from the "Native Chopped" Cooking Competition Awaiting Critique by the Elder Judges

Both formal and anecdotal evaluation of the gathering demonstrated that there was an overwhelmingly positive response to the event. One participant said, "I feel so in my native element! After eating all of these traditional

foods, I can feel it pumping through my veins!"

Another participant wrote, "[The biggest take-away was]…policy and how it needs urgent attention. I needed the recharge with this gathering to continue the work at home."

The feedback indicated that participants most liked having the opportunity to connect, learn from one another, and share resources, as well as having traditional foods incorporated into all the meals.

In the chairman's notes in NPAIHB's fall 2018 newsletter, Mr. Joseph states, "The gathering highlighted communities across the Northwest that are working on food sovereignty and food system change. Our traditional foods and medicines are healing, and they can help us prevent chronic diseases."

The momentum and energy from the gathering continued, and there were requests for a Food Sovereignty Assessment Tool training. WEAVE-NW partnered with Valerie Segrest of Muckleshoot Tribe and the First Nations Development Institute (FNDI) to provide a day-and-a-half training on the Food Sovereignty Assessment Tool in late fall 2018 (FNDI, 2014). Many Northwest tribes expressed interest in conducting assessments in their own communities and developing action plans.

It is through opportunities like the NTFSC gathering, trainings, and meetings that members are able to work intertribally and across sectors to address issues facing the tribal food system. Continued development, recruitment, and sustainability planning of the NTFSC are necessary to ensure all Northwest tribes are heard and are recognized for their leadership in the food sovereignty movement.

Together, we are building a strong collaboration of tribal nations, tribal organizations, and allied partners to work effectively toward true tribal food sovereignty.

Figure 3. Salmon That Would be Served at the Traditional Dinner for the Gathering Cooking over the Fire

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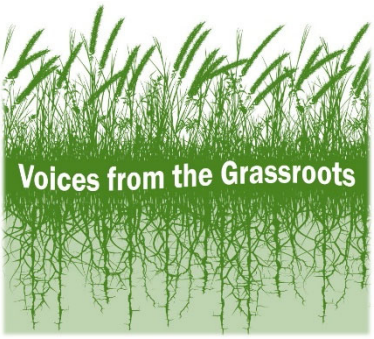
Reviving and reclaiming our native food system: Leadership experiences of a research project's community advisory board

Special JAFSCD Issue

Indigenous Food Sovereignty in North America

Swette Center for Sustainable Food Systems
Arizona State University



Rhonda Bowers (Northern Arapaho) *
Chair, Growing Resilience Community Advisory Board

Pat Harris (Northern Arapaho)
Co-chair of the CAB

Clarisse Harris (Northern Paiute)
Secretary of the CAB

Kathryn Lone Fight (Eastern Shoshone)
CAB Member

Ina Weed (Eastern Shoshone)
CAB Member

Nelson Pat White (Northern Arapaho)
CAB Member

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As proud Native community leaders who call the Wind River Reservation home, our battles for sovereignty and respect are not just part of a long-ago history. Claiming our self-empowerment and putting it to good use on behalf of our entire community are challenged more often than we care to recount. In the matter of sustainable food security, those of us who agreed to serve as members of the Growing Resilience Community Advisory Board (CAB) were reminded of such events. Our CAB was established in 2016 as an oversight group for community wellbeing for a University of Wyoming (UW)–initiated and National Institutes of Health (NIH)–funded research project on gardening and health.

Our history on this 2.2-million-acre (890,000-hectare) reservation in north-central Wyoming is

* Rhonda Bowers, chair of the Growing Resilience Community Advisory Board (CAB) (Northern Arapaho), Wind River Reservation, Wyoming, USA; rbowers@uwyo.edu

deeply rooted in the fact that this is the only reservation in the country to have been established for two tribes: the Northern Arapaho and the Eastern Shoshone (which were warring tribes when first forced to live here together). Of the nearly 27,000 people living here today, about 5,000 Eastern Shoshone and 10,000 Northern Arapaho are enrolled tribal members. When looked at by numbers alone, we're a diverse community, but comparisons between the tribes, along with the socio-political issues that arise as we embrace relationship-building of all kinds, tends to polarize views of these sovereign nations and the Wind River Reservation overall. As individuals, many of us feel as though our personal identities, and our contributions, can get lost in the fray.

Like other indigenous groups, the Northern Arapaho and Eastern Shoshone people of the Wind River Reservation have long been targets for research, philanthropy, and judgment. Some of it has been helpful as we continue to battle the legacy of internment, work to claim our rights, and reclaim our traditions, heritage, and culture as we define them. But much of what has been brought to us or imposed on us has been harmful to varying degrees—and in recent times, very often by a lack of recognition and utilization of our own hard-earned, community-based expertise and leadership.

In 2011, a research project of a type that was new to us at the time (we were told it was community-based participatory research) received joint-tribal council approval to designate the Wind River Reservation as one of the project's five community partner sites that would spend the next five years studying community efforts to improve food security and food sovereignty. The Food Dignity research project was offered through a U.S. Department of Agriculture's Agriculture and Food Research Initiative (USDA AFRI)–funded grant received by UW, and for the first time any of us could remember, it was our knowledge, our stories, our experiences, and our work as we saw it that would be supported and valued.

Blue Mountain Associates (BMA), a Northern Arapaho-led, local nonprofit health organization known for its commitment to working equally with both the Northern Arapaho and Eastern Shoshone tribes, served as the community leader on the Food Dignity project. Their implementation of the project included the creation of a community advisory board; the distribution and support of food systems–related minigrants; the expansion and management of farmers markets; the two-year collaboration on Wyoming's first statewide community food summits; and the photographing and video- and audio-recording of a wide variety of community stories about our tribal history of food and food insecurity.

Through the Food Dignity project, Native community members served as activists and leaders, reviving and reclaiming our native food system. Gardeners, farmers, health workers, and entrepreneurs became more visible to outside agencies and funders, as well as to food systems activist groups across the country. We sat on the BMA advisory board that solicited, reviewed, and distributed minigrants to community members who were passionate about being part of the movement demanding the return of a long-lost healthy food system we should be in charge of.

As the Food Dignity project came to a close, its principal investigator, Christine Porter from UW, developed the Growing Resilience research project that was funded in 2015 by NIH as a five-year randomized control trial to study the health effects of gardening on 100 Wind River Reservation Eastern Shoshone and Northern Arapaho families who were new to growing fruits and vegetables in their own home gardens. BMA community-based staff help the families plan, build, and grow their gardens, and UW team members gather information about the health impacts of these gardens and the overall project itself. The Growing Resilience CAB was written into the project proposal to oversee the work of both UW and BMA, particularly in regard to how the project serves the wellbeing of the community.

Those of us who were asked to serve on the Growing Resilience CAB saw it as an opportunity to help improve our food supply and food system. We were invited to join in a variety of ways. Gayle Woodsum of Action Resources International in Laramie, Wyoming, who serves as the community liaison for the CAB, invited many of us as a result of her work in a similar role with the Food Dignity project. She also asked for recommendations from

Native community leaders. She told us at the outset that she was primarily interested in seeing a balanced representation between Northern Arapaho and Eastern Shoshone community members, with a mix of experienced and emerging community leaders among them to lead the CAB. By recommendation, an agency representative from the reservation-based UW Extension office and one from Indian Health Services also accepted invitations to join the CAB.

This was a research project that would not only result in data that were health-related and valuable to the community, but would also end up developing 100 new gardening families who cared about where their food came from and how it could contribute to improved health. Serving as leaders overseeing the community benefit and value potential of the project meant much more to us than limiting our vision to the confines of the research being conducted. Right from the start, we saw the Growing Resilience CAB as a way to be part of bringing back what was lost as a result of what colonizers took from us. When our people were forced onto the Wind River Reservation, we were denied sovereignty over our own food system—the government took away all of our healthy, traditional foods. Those original crimes against us became worse over time. What had once been our tradition of balanced diets coming from the land around us was replaced by artificial, processed, and cheap foods. That non-Native way of feeding us continues today as evidenced by governmental commodity giveaways that include processed meals, candy, and soda.

When each of us agreed to serve on the Growing Resilience CAB, we did so to make a difference, not just for the five years of the research project itself, but in service to a vision of long-term, sustainable food security for our community. We were interested in seeing community food systems work extend beyond time-limited research projects and be led by our own community members. We looked forward to being kept informed of the progress of what would be a very large research project involving many community members who would participate intensely for years as they learned how to garden at their homes and would undergo regular health data collection checks and personal interviews to help determine the impact of those gardening projects on their health and their lives.

It felt like an honor to have the opportunity to stay informed about the details of the project and to be available to hear any questions or concerns of the community that we would then work to address. The Wind River Reservation, in the past, has experienced research as being a process of taking our experiences from us and putting them out into the world in a way that was exploitive and even inaccurate. Our role as CAB members charged us with being certain the participants and the entire community were being served well by being involved in the Growing Resilience research project.

As the CAB gathered to meet early on in the project's implementation, we were stunned to learn that our reasons for agreeing to serve and the hopes we had for what we could be part of building did not line up with how we were first received and treated. At the outset, the composition of the board was questioned by other Growing Resilience project team members. They wondered whether there was enough diversity of tribal representation among us and whether we had the right experience to successfully serve the CAB. The biggest concern of all came from some project team members who were upset to learn that the CAB would conduct our own meetings without other team members present. We wondered if rather than it being appreciated that we, as community leaders, had something important to contribute, our role as described in the project proposal and as it has been explained to us was actually going to be taken seriously.

Nevertheless, in our early meetings as a group, we were excited about helping to guide the Growing Resilience project as it began to track our community's health concerns through the lens of home gardening. We drafted questions for the research team to gather information on how the gardens were progressing and how the participants were doing with them. At the same time, we talked about how we wanted the CAB's decision-making to work and quickly agreed with each other that we were committed to the idea that one of the primary goals of the group—beyond ensuring that the community was being served well by the Growing Resilience project—was to create supportive and

educational food system programs that would continue to operate long after the research project was over. We wanted to set up a community network that would provide ongoing support to the 100 gardeners who would come from participating in the project.

At one of our earliest meetings, one of the CAB members remarked on how pleased she was that the group was made up of a majority of local Native community members, which was rarely the case in similar projects. She respectfully turned to the two agency representatives and told them she meant no disrespect to them or their membership in the group. Within hours of the close of that meeting, both agency representatives tendered their written resignations from the CAB without stating reasons for doing so.

That meeting was followed by an explosive few weeks, during which we heard through gossip that the resignations had been tendered because the white members of the group had felt they were victims of reverse racism. We were told by some community leaders that we had jeopardized good relationships that had been going on for years. We were confused and distressed by what felt like unreasonable reactions that were disrespectful of us. The feelings were compounded at the next meeting at which we requested that all Growing Resilience project team members be present. At that time, we presented our list of questions about how the project was going: how were the gardens doing and how were the participants feeling about things? In order to fulfill our project oversight role, we wanted details about project implementation. But instead of the kind of information we sought, we were told that due to confidentiality issues, we would not be given any details about participants or the status of their gardens.

We were stunned and frustrated. We'd been charged with ethical oversight, yet we would not be trusted with anything the researchers deemed confidential. And their list of what couldn't or would not be shared was very long. In addition to our not being permitted to know who any of the participants were, we wouldn't be allowed to see the gardens they were being given and helped to grow, given details on whether or not individual gardens were being successful, nor given any information on how participants felt about the success or failure of their gardens and if they felt as if they needed more help in learning how to garden.

Yet we were told it was fine for community members, including research participants, to come to us on their own with any concerns or questions they might have. Our contact information would be provided to them by the research team, we were told. This meant we had no way of developing trust with the participants unless the research team informed them of us, although the researchers or other team members could be the very people they might want to question or complain about. It was as if the project administrators hadn't really been planning on using us. We needed to push back. We felt we were not supposed to think or ask questions, and that we were being belittled, but we just kept moving ahead.

There we were, giving of our time and expertise on tribal and community history, gardening, and community leadership, and yet it was as if we were digging into information that didn't concern us. All we wanted and expected was to be treated as equal human beings, and it suddenly felt as if those in control of running the project thought we weren't on the same level as them. It was as if they wanted the project to be purely scientific and that making it safe and helpful at the community level didn't matter anywhere near as much.

We wanted to bring heart into every aspect of the project, both as CAB members and as members of the community. But we began to have the sense that we were just meant to rubber-stamp what the research team wanted to have done. When we pushed back against the notion of being treated like puppets and continued asking for necessary information on the progress of the project, it caused problems for everyone.

But we had each other. We were determined to own and use our self-empowerment. We believed in the idea of this project, and we believed it could be valuable if it also were led by a vision of becoming something sustainable long after the research was completed and its findings were published. We changed the original concept that the CAB would only meet a couple of times a year and began to conduct monthly meetings. We've added two new Native community leaders to the CAB member-

ship. We kept asking the questions we wanted answered and didn't shrink when we ran into barriers. Little by little, we found a way to explain that we weren't trying to break confidentiality. We needed the kind of details necessary to be sure the project was going well and a way for project participants to get to know who we were so they would feel comfortable coming to us with questions or concerns.

It took more than a year to create an environment of good communication between the CAB, the garden installation component, and the research component of the project. We stood firm as an independent leadership group with oversight responsibilities. Gradually, the rest of the Growing Resilience team learned how to answer our questions. They held public receptions where community members and project participants interested in meeting us could come to visit and talk.

As a result, we made ourselves a valuable resource for reclaiming sovereignty over our own traditional foods and local food system. We procured the use of land to create a community and educational garden. We have now given presentations twice at the annual national Seeds of Native Health Conference in Minnesota. We sent a representative to attend a Rocky Mountain Tribal Food Sovereignty summit in Montana in 2018 and will be sending two representatives in 2019.

We're using this program to reach large goals—using the Growing Resilience research project and our role as its CAB—as an open door that can lead to more opportunities for continued self-empowerment for us, all the research project participants, and our entire community, to create a ripple effect for yet more waves of valuable resources to come.

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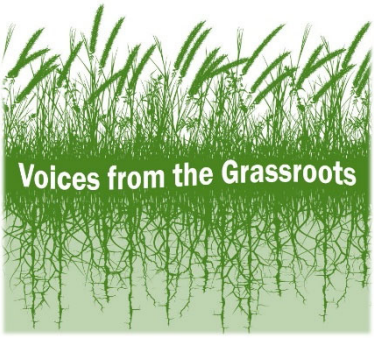
White Earth Food Sovereignty Initiative: What food sovereignty looks like on the sovereign nation of White Earth

Special JAFSCD Issue
Indigenous Food Sovereignty in North America
sponsored by
Swette Center for Sustainable Food Systems
Arizona State University

Zachary Paige *
White Earth Band of Minnesota Chippewa Tribe



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Here in White Earth, we started our Food Sovereignty Initiative in the fall of 2017 to bring together and organize community-driven efforts that aid in establishing a sustainable and sovereign food system based in traditional methods of planting, gathering, harvest, hunting, and fishing—all protected by tribal policy.

We start our food sovereignty work primarily through gatherings with the White Earth community. Once a month, or sometimes once every two months when we are busy planting and gathering, we hold a potluck food sovereignty meeting (see Photo 1). Present are our core partners, such as the White Earth Tribal and Community College (WETCC) Extension Service, with whom we are intertwined in many grants and commitments. Other partners include our White Earth health department, dieticians, nutritionists, SNAP-Ed, 4-H youth agriculture program, directors and managers in education, the agriculture department, natural resource department, commodity foods program, and the Elder Nutrition Program. Other partners include nonprofits, interested community members from White Earth, and others doing similar work coming from our neighboring reservations Leech Lake and Red Lake.

These food sovereignty meetings are also healing meetings. We do the best we can to prepare foods that are traditional or at least healthy. This is our time to sit and visit, things that are often lost in our busy technological age. At the meeting held in December 2018, we had some smoked goldeneye from Red Lake Fisheries, shared by David Manuel in Red Lake, canned venison sliders from the WETCC, wild rice and buffalo brats from White

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Earth, and quinoa salad from Diane McArthur, our White Earth nutritionist. We have fruitful conversations that are rooted in the true needs of our community, keeping us on track and building toward a grounded food system in White Earth. The conversations keep us engaged and empowered to make focused efforts and have an effect on the sometimes overwhelmingly broad need for a healthier food system. From time to time we also invite outside speakers from other organizations, University extension and researchers, the state agriculture department, who join us to learn about our community needs. Those attending our meetings regularly know that each of us is a slice, part of filling the big circle of food sovereignty. We all go back to our departments and families and play our role and expand upon our gifts that fit us as individuals and within the community. Then when we come back together, we share our experiences in increasing our communal understanding of our progress and how to work together effectively as a group. By having such an extraordinary and diverse group of community members focused on food sovereignty so close to the ground level come together regularly, we are able to act as branches on a connected system of roots, as we are all well aware that there is much work yet to be done.

Photo 1. White Earth Food Sovereignty Initiative Meeting

Photo by Nolan Morice.

The overall health of the White Earth community members is of vital importance. There are many areas of health: mental health, dietary health, disease treatment, physical improvement, as well as elder and youth care. We focus on food as a healing and universal glue to bring people together to heal our bodies, minds, spirit. There are sometimes challenges in accessing traditional and healthy food when living in the country—even when there are plenty of people gathering, planting, and hunting for themselves or their families. When observing food access from an eagle's view, the majority of the White Earth Reservation is a federally recognized food desert, because many people live upwards of 20 to 30 miles away from a big grocery store where most people shop for their daily foods. And even when shopping at those, there are limited traditional or healthy foods available.

Together, we created a food sovereignty assessment survey for the White Earth Reservation community members in 2017 and received over 250 responses (Figure 1). We will be able to use findings about our demographics in our dialogue moving forward. The responses also revealed the lack of cooking and reasons for the lack. We also found out that the White Earth community is very invested in all of the programs we suggested to aid in increasing traditional and healthy food access, including a farm-to-school program, a tribally shared agriculture program from a White Earth farm, and a mobile market grocery.

In 2017–2018, the White Earth Food Sovereignty Initiative (WEFSI) staff started with one person, Zachary Paige, as coordinator. With a limited staff we are limited in some ways, but we utilized many volunteers from the White Earth community and beyond to start our White Earth Community Pilot Farm. Volunteers include the Extension Service of WETCC, families and interested community members, the White Earth Natural Resource Department, the ACUTE Care

men's health facility, youth from the White Earth 4-H, students from Minnesota State University, the nonprofit Global Citizens Network, and others. We grew, cultivated, and harvested plots with the three sisters (corn, beans, squash) using traditional mounding system (Photo 2). With a family and elder program that met weekly, we went through the entire gardening process. We offered traditional seeds that we have been saving for years for people to choose from and plant. We grew a diverse range of vegetables, such as pumpkins, potatoes, peppers, and tomatoes, as well as strawberries in a low tunnel system to keep out weeds. We were also involved in a cover crop project led by Vivian Wauters from the Grossman Lab at the University of Minnesota, as well as a sweet corn taste test project from Iowa State University. The cover crop project showed which varieties of cover crops worked best in our soil type throughout the summer and demonstrated how they cool the soil, keeping soil microbes alive and adding organic matter to the soil. We held a community soil health day to showcase the results of this trial as well as to discuss soil health principals from both sustainable farming and traditional viewpoints.

To respond to another need identified in the survey (Figure 2), in 2018 we purchased a food truck to cook and distribute traditional healthy foods throughout the reservation. To support this project, we received funds

Figure 1. Graph Displaying Results from a Question from the White Earth Food Sovereignty Survey Regarding Gardening Activities

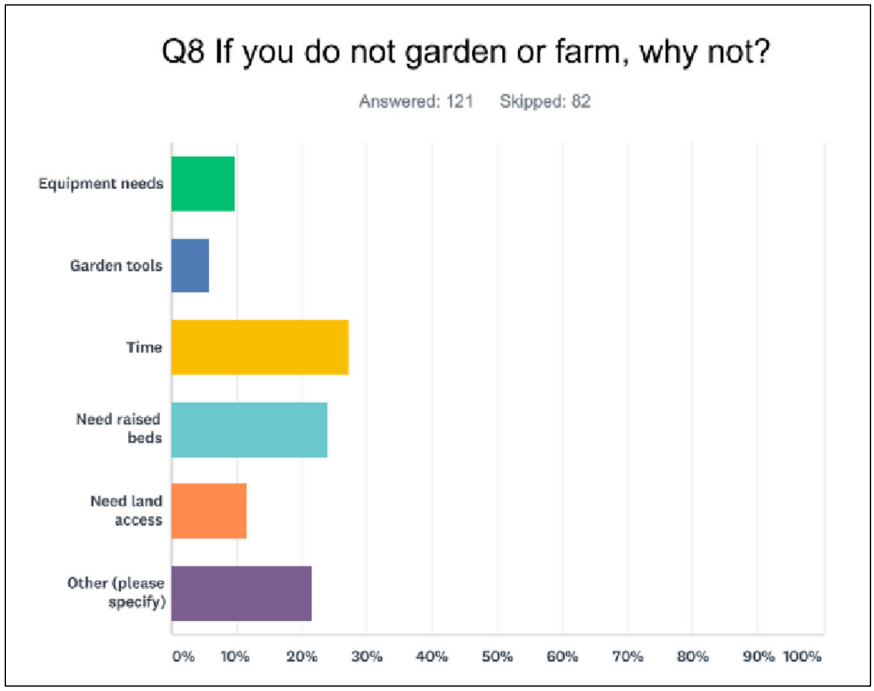
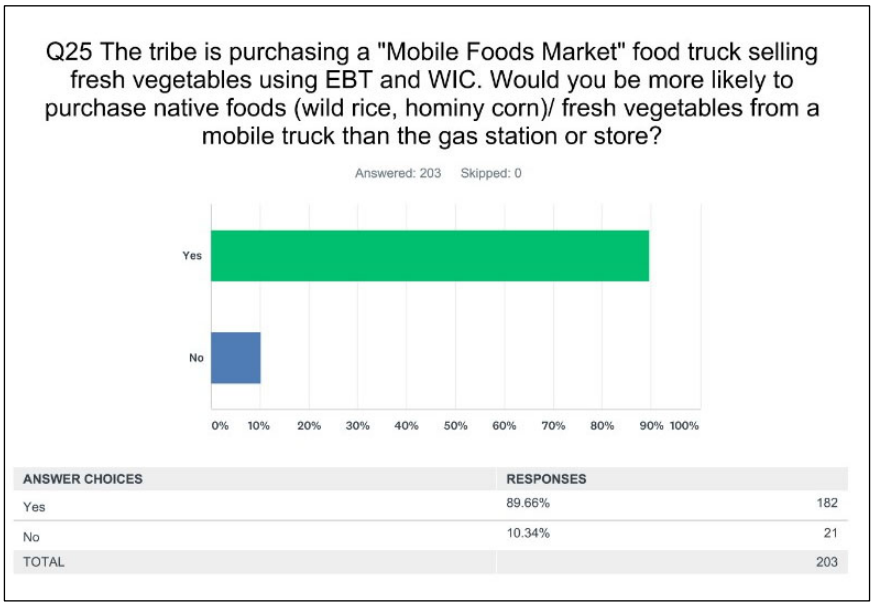


Photo 2. Stanton Stanton Alexander with White Earth Youth Planting in a Three Sisters Traditional Garden System

Photo by Zachary Paige.

from the Indian Health Service (IHS), First Nations Development Institute (FNDI), Good Food Access Fund (GFAF), and the White Earth Band of Minnesota Chippewa Tribe. We purchased our food truck from Sean Sherman, the Sioux Chef, and rebranded it with a design to show that we will not only be selling prepared traditional foods off the truck at events, but also will be a mobile grocery distribution unit. In the summer of 2018, we grew strawberries and ground cherries at our farm and used them in smoothies sold at the Mahnomen Farmer's Market and at the White Earth and Rice Lake pow wows to advertise the truck and showcase what we will be providing as a mobile market. We held meetings to showcase the truck in the communities in White Earth that have limited access to grocery stores, such as Rice Lake and Naytahwaush (and of course cooked a traditional meal at each one). We also got the community council's opinion on route schedules and drop-off points for the future mobile grocery. We are currently getting the truck up to par with improvements needed to hold grocery foods, and figuring out staffing, drivers, and our route, as well as applying to USDA to accept SNAP and WIC dollars. We are also purchasing from local and traditional producers some traditional food items that we plan on selling off the mobile market, such as wild rice, maple syrup, dried berries, wild herbs as teas, and many more items. Some of the traditional food items, such as tribally produced popcorn and olive oil from outside reservations, may be purchased from our Intertribal Agriculture Council technical assistant, Dan Cornelius, who has started a mobile traditional farmer's market of his own.

Figure 2. Graph Displaying Results from a Question from the White Earth Food Sovereignty Survey Regarding the Mobile Foods Market



There are other projects happening, such as bison and hemp programs that are just getting some footing. The big picture for the White Earth Agriculture Department is to continue to grow out more traditional seeds on more acreage and provide White Earth businesses with traditional foods such as corn, beans, squash, popcorn, and more to package and sell back to community members at an affordable price. We also grow out and keep pure many varieties of old seeds that are very often higher in nutrition than conventional hybrids. The hemp program has the potential to supply up to 25 more jobs, as well as the opportunity to grow and produce hemp as an agricultural product on a medium to large scale. At this time, when there is a trend of eating healthy and growing interest in food justice and food sovereignty in our country, we are able to utilize the movement of these efforts to gain support primarily from young people of privilege as they recognize the disparity of wealth provided to people of color in this country for centuries.

Along with our food sovereignty meetings, we use many forms of outreach to the community to get the word out on what we do. One way we do this is through our tilling program, in which we tilled over 60 community members' gardens in 2018 and provided gardeners with access to seeds. We post articles on social media, on the radio, and through our tribal newspaper. We host events throughout the year at our White Earth Commu-

nity Farm in Mahnomen, Minnesota. We also host the annual Indigenous Farming Conference gathering, where representatives of many food sovereignty programs meet and discuss their stories. It is always an enlightening time to visit and partake in hands-on activities. The theme of the 2019 conference is Aanji-bimaajitoon Gidibaajimowininaan (*Revitalizing Our Story*).

Resources

Articles:

- NPR Morning Edition episode, *White Earth hopes food truck puts reservation on road to better health:* https://www.mprnews.org/story/2018/07/27/white-earth-minnesota-food-truck-native-health-sioux-chef
- NPR Morning Edition episode, *White Earth tribe holds high hopes for hemp:* https://www.mprnews.org/story/2017/08/09/white-earth-tribe-high-hopes-hemp

Videos:

- Minnesota's Good Food Access Program Profile: White Earth: https://youtu.be/E_9aottj1n4
- Minnesota's Good Food Access Program: https://youtu.be/u0qjAaDW3BY

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COMMENTARY

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Swette Center for Sustainable Food Systems
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Decolonizing the Caribbean diet: Two perspectives on possibilities and challenges

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Abstract

We wonder if food and agriculture will be an emergent theme in reclaiming the identity of the Taíno, the Indigenous people of the Caribbean. As we consider the emergent movement to decolonize our diets and utilize food as medicine alongside veganism and vegetarianism trends, we wonder how and if food, foodways, and agriculture are or will be tools to decolonize and reclaim the Taíno identity. In this paper, we will explore two perspectives on the possible opportunities and challenges of such movements and how they will look in the Caribbean and its diaspora.

Keywords

Caribbean Foodways, Caribbean Diet, Dominican Republic, Puerto Rico, Taíno

Introduction

The narrative of popular history holds that soon after Christopher Columbus arrived in the Caribbean in 1492, the Taíno, the Native American inhabitants of the region, were almost completely decimated by slavery, disease, starvation, and war. In Cuba, Jamaica, Haiti, the Dominican Republic, Puerto Rico, and the Lesser Antilles, 90% of the Native population may have died within a half century (Smithsonian Global, 2018). While the study of the conquest has generally focused on the social, political, and economic devastation inflicted on Indigenous populations such as the Taíno, the

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matter of food is rarely considered (Smithsonian Global, 2018). Yet food was a principal tool of colonization. Arguably, one cannot properly understand colonization without considering the many ways that food has been used as a tool to colonize the body and the mind, as well as the physical landscape. Although today we can recognize many Indigenous foods as staples of Latin American diets, we must also acknowledge the legacy of colonization in this diet (Alvarez, 2018). Primary accounts documenting the process of colonization in the Caribbean, especially in its largest island, formerly known as Kisqueya or Quizqueya and renamed Hispaniola by the Spaniards (today Haiti and the Dominican Republic), recount the impact of inadequate food for the Taínos. The early impact of famine and malnutrition on the Taíno is not well understood, but extreme labor with inadequate supplies of food and tainted water led to dehydration, malnutrition, and, at times, outright starvation. The *conquistadores'* diet that the Taínos were forced to eat was inadequate, and the conquistadores attributed the death of many Taíno to the strain of traveling between the mines and the change in their diet (Cook, 2002).

Nevertheless, many Taíno words that can still be found in the Caribbean relate to foodstuffs and agricultural production, thus continuing to transfer native knowledge. An example is *casabe,* a flatbread made from yucca or cassava flour. Other prominent examples are the traditional house style called a *bohío,* made with local materials that are weather-resistant, and the *conuco,* the garden plot (Palmer, 2018). In the beginning of the 20th centrury, during an ever-changing socio-economic and political landscape, these traditional practices helped rural Caribbean resident with limited funds to build their own homes and feed themselves (Palmer, 2018).

The erasure and lack of recognition of Taíno foodways and culture as part of the mainstream Caribbean culture concerned us. We set sail to discover what already exists, since it has always been there: a movement hoping to conserve and revive Taíno identity and culture across the Antilles.

How do you revive and reclaim cultural practices when the world thinks they disappeared hundreds of years ago? That is a question explored in the "Taíno: Native Heritage and Identity in the Caribbean," a new exhibition by the Smithsonian National Museum of the American Indian and the Smithsonian Latino Center and through a team under the name the Caribbean Indigenous Legacies Project. This team is also conducting research on what it calls "resurgent indigeneity":

> What it means to "be" or "become" Indigenous for a people who are not typically seen, or who are no longer accepted, as Indigenous. To do this, [they are] investigating Indigenous consciousness among Antillean Latinos, particularly among Puerto Ricans who are recovering an Indigenous Taíno heritage, reclaiming Taíno identity, and reconstituting Taíno community. (Marigny, 2016, para. 3)

As we consider an emergent movement such as the one described above, we wonder *how* and *if* food, foodways, food sovereignty, and agriculture *are* or *will be* tools to decolonize and reclaim the Taíno identity in the Caribbean and its diaspora of approximately 4.4 million Caribbean immigrants in the United States (Zong & Batalova, 2019). In this paper, we will explore two perspectives on the possible opportunities and challenges of such movements and how will they look in the Caribbean and its diaspora.

Perspective 1

Caribbean Food and Diet With or Without Taíno Reclamation?

Vanessa García Polanco

I started my inquiry about *Tainídad*—what is to be Taíno? What is it to be Taíno today?—with the subjects of food and agriculture, knowing that Taínos praised the god Yocahu as the giver of *yuca* (cassava). That led me to further consider why and how yuca is no longer the praised tuber it once was in the Taíno Caribbean, when other tubers like potatoes associated with western foodways are taking a stronghold.

Variations of the Caribbean diet have existed traditionally across the more than 20 islands and

nations that make up this territory where over 40 million people live. Our eating pattern is a blend of the broad traditional diets of major cultures: the Indigenous people, the Spanish, and continental Africans (Oldways, 2018). At the moment of conquest, the Taíno cuisines were rather simple, yet the foodways of the Caribbean are the ones most similar to those of Spain (Raichlen, 1998). The Spanish-speaking Caribbean (Cuba, Puerto Rico, and the Dominican Republic) shares a similar food culture, a rising concern over growing obesity rates, and increased consumption of energy-dense and ultraprocessed foods, but as nations, we differ in our current economic and political conditions (Fuster, 2016). Spanish-speaking Caribbean countries are characterized by traditional dietary patterns, where rice and beans are staples and reaffirm the Caribbean identity (Ortiz Cuadra, 2013). Today, a variety of ultraprocessed foods and drinks, including sugar-sweetened beverages, are ever-present and constitute add-ons to traditional diets. These products are cheap and widely available due to local manufacturing or better trade conditions, and are becoming more ingrained in local food cultures. While current diets tend toward energy-dense foods, an increase in the consumption of pre-prepared food products and foods away from home has resulted in a lower consumption of fruits and vegetables (Fuster, 2016). In my own childhood, *merienda* (snack time), between ten and eleven AM for school recess and between three and five PM, was marked by the consumption of snack foods as *papitas* or chips, sometimes potato chips, plantain chips, or corn-based *fandangos* and *hojuelitas*. Other snacks included sugar cookies, chocolate and cream cookies, a local baked good, an imported chocolate bar, other local flour-based snacks, and a *refresco,* or soda, usually from a local company or perhaps an American brand. Thus, although endemic fruits were largely available year-round, my palate was not trained to favor them or see them as a snack or a major component of my diet. Perhaps it was my privilege as a middle-class Dominican in a city, who thus could afford these high-sugar and high-calorie snacks, or my family's willingness to satisfy the picky eating behavior that prevented me from trying and learning to consume many fruits and vegetables that are part of my food culture and native to the Dominican Republic that only now I am willing to eat.

An answer to this could be that the Caribbean might be on a path to, or is already experiencing, what many communities do to resist a change in their diet due to an influx of "unnatural foods"—using food as medicine, as food-based solutions are utilized for chronic disease prevention and management. Often there is a call to go "back to your roots": to eat traditional foods, to eat fewer foods that were adopted during the colonization process, and to acknowledge how processed foods have affected our diets. In the U.S., we see food as medicine as a niche as minorities, immigrant, and Indigenous communities are reclaiming their ancestral foodways. Publications such as Calvo and Esquibel's *Decolonize Your Diet: Plant-based Mexican-American Recipes for Health and Healing* guide readers to explore and reclaim their indigenous foodways as an act to decolonize their diet, use food as medicine, and reclaim Native American heritage. I am concerned, however, that in an attempt to use food as medicine in the Caribbean, we might forget about the necessary process of decolonizing our diet as a whole and may just perpetuate a new kind of food imperialism and culinary colonization (Steckley, 2016). This could happen if many more people were to adopt food as medicine and rather than choosing pre-contact Taíno foods such as cassava, batata, corn, beans, guanabana, jagua, guayaba, and mamey (Moscoso, 1999), were instead to choose potatoes, tomatoes, spinach, grapes, avocado, citrus, wheat, and quinoa. While some of these fruits, vegetables, and cereals are native to the Americas and are currently present in Caribbean foodways, they are not specifically Taíno foods, so decolonizing one's diet and foodways in the Caribbean context does not really happen by becoming vegan or vegetarian. Focusing only on plant-based foods as the foundation for food as medicine and health could impose other foodways and cuisines such as Asian or Mediterranean, and western foods overall, as preferable to choosing a plant-based diet that is Caribbean or of Caribbean descent. There are already more than 10 self-identified vegan and vegetarian restaurants in the Dominican Republic and over 30 in Puerto Rico. With many more

Caribbean vegan and vegetarian outlets in the places the Caribbean diaspora live, like New York City. Food choices often mark identity and legitimize social differences, and in the Caribbean *who* is willing to decolonize their diet and their reasons for doing it could further exacerbate and reinforce class hierarchies (Steckley, 2016), thus leaving low-income people and farmers of color out of the process.

A plant-based diet is not a full answer to reclaim Taíno foodways, however, since Taíno people also consume shellfish, fish, iguanas, and small rodents endemic to Hispaniola and the Antilles as part of their diet (Moscoso, 1999; Nold, Johnson, Conrad, Beeker, Kauffman, & Elswick, 2009). At the same time, as eaters wanting to reclaim traditional Taíno foodways, we cannot ignore how those traditional foods are produced. We need to gain more knowledge of plants beyond foodstuff consumption and of agricultural practices to preserve and reclaim traditional ecological and agricultural knowledge. Nevertheless, we cannot decolonize our diets without decolonizing the agricultural system that is producing those traditional foods, our landscapes, our history, our bodies, our minds. Processes such as "recovery," "reclamation," "indigenization," and "decolonization" can be very different and diverse. Recovering Taíno foods may actually not be decolonizing, even if done widely, if certain cultural, social, and political changes do not occur.

Perspective 2

Integrating New Knowledge into our Conversations About our Taíno Heritage

Luis Alexis Rodríguez-Cruz

One of the elementary school trips I vividly remember was when we visited the *Centro Ceremonial Indígena de Tibes* in Ponce, Puerto Rico (PR). It is one of the most important Taíno deposits of the Caribbean, and one of the most significant in PR (Curet & Stringer, 2010). There we were shown how they lived, what some of their customs were, and we even also dressed up like them. It was not until I arrived at the University of Puerto Rico at Ponce that I started to better understand the Taíno history of PR beyond the superficial. Significant archeological sites can be found throughout PR, and according to historical records the archipelago had one of the largest established Taíno populations. Through my school years, it was very common, especially during *La Semana de la Puertorriqueñidad*, a week designated to celebrate Puerto Ricans diverse heritage, that I was reminded that all Puerto Ricans have Taíno, African, and Spanish blood flowing through our veins. It was (and maybe is still is) a very folkloric week. We would dance like *jíbaros*—that is what Puerto Rican peasants, or *campesinos*, are called, and is also misused to discriminatorily describe the ignorant or the poor. Today, it has a different connotation, and many groups have worked to reclaim *jíbaro* as a sign of Puerto Rican pride and rooted values, since these people were strong and cultivated our lands. We would also listen to *bomba,* the Afro-Puerto Rican rhythm that makes everybody move to the beat of the drums. Moreover, we would experience Puerto Rican dishes. I do not recall being aware of the Taíno heritage of some of our dishes. Again, it was not until my days of higher education that I developed an awareness of Taíno history and began grasping their influences on our main dishes. What I do recall is how we were taught, in and out of school, how the Taínos were decimated, how lazy and naïve they were, and how they do not comprise a significant part of our heritage. Today, the work of geneticists (e.g., Schroeder et al., 2018) has become part of a wide range of scholarship, from history to archaeology, that is letting us know that these beliefs about the Taíno are not true.

The Taíno were an advanced people who contributed substantially to the Puerto Rican heritage. Not only did they combat the Spaniards' oppression, but they also contributed their culture to today's Puerto Rican customs and foodways. It seems that the Taíno were not totally obliterated, but that many integrated into the Puerto Rican identity. Recent research has shown that a significant percentage of Puerto Ricans carry Taíno genetic markers (Schroeder et al., 2018). And most of that heritage comes from Taíno women, likely because of forced integration by the colonizers.

Today's narrative is changing to one of inclusion and acceptance of a new reality. I understand

that new scholarship could shape how we Puerto Ricans (and Caribbeans, more generally) are taught about the Taíno in our history, and thus concretize a robust presence in our views of the Puerto Rican and Caribbean heritages. Furthermore, understanding our identities beyond the trivialized "Puerto Ricans carry Spanish, African, and Taíno blood" can serve us to contest our own colonized mindsets.

'Colonialism' is a present word in PR. Today, PR is subject to a fiscal control board, appointed by the Obama administration, which has pushed for austere measures that affect Puerto Rican's wellbeing. The subject of Puerto Rico's status as an unincorporated territory of the US is a common one. Almost all Puerto Ricans have an opinion on whether PR should become a state of the US, seek sovereignty, or stay as it is. But the colony, beyond a sociopolitical framework, is also a mindset. How can I work to decolonize PR if I am still colonized? Understanding PR's reality, and my experience within that reality, has given me the opportunity to contest thoughts and ideas that have contributed to perpetuate the idea that PR is well as it is. Supporting local agriculture, recovering and reclaiming traditional knowledges and foodways, such as those from the Taínos, is one first step to contest that coloniality.

Today, I eat a *pastel,* a delicious dish made of a mix of tubers filled with pork or meat. My grandmother makes *masa,* a mixture of taro root, tropical squash, and green banana, seasoned with annatto and other spices and herbs. Then she spreads the *masa* on a flamed plantain leaf, puts pork in the center, wraps it, and boils it until ready. Puerto Ricans have a variety of mixtures and ways of preparing *pasteles,* but the principle is the same: a dish that not only has Spanish and Afro-Caribbean influences, but also Taíno (Ortiz Cuadra, 2013, 2018). I think of how tubers and achiote (a spice creating from local evergreens), traditional in Taíno foodways, are incorporated in the making of a *pastel.* Furthermore, that recovered and validated knowledge could serve us in better grasping the idea of decolonizing our diets by shaping our understanding of our diverse heritage.

Young Puerto Rican farmers and chefs who have an agroecological perspective are leading conversations about the importance of reshaping how we eat and farm so as to incorporate traditional food of our ancestors (e.g., Pagán-Roig, 2017). Processed foods, as well as those from fast-food chains, have been heavily integrated into the Puerto Rican diet since the 1950s. The rise of noncommunicable diseases in Puerto Rico and their impact on public health have been related to changes in diet and to sedentary lives. This reality should not be ignored if we want to bring back (and validate) traditional foodways.

Thus, eliciting new knowledge that clarifies our views of the Taíno, while also integrating actors within our local food systems, is essential in my view to building a starting platform that will serve us to better build a sociocultural awareness of the Taíno heritage in PR. Hence, if we want to start a movement on many levels that aims to decolonize our diets through validating our Taíno heritage, we must seek ways to incorporate and communicate that new knowledge of our Taíno reality into our conversations, and thus contest our coloniality.

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COMMENTARY

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Sogorea Te' Land Trust empowers indigenous food sovereignty in the San Francisco Bay Area

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Abstract
Indigenous food sovereignty is about much more than consumption choices, food access, and traditional knowledge; it is fundamentally about access to land for sacred ceremony and traditional practice. This article will highlight an innovative case study in indigenous land "rematriation" (returning the land to its original stewards and inhabitants) on the occupied lands of the Chochenyo and Karkin Ohlone peoples, also known as Oakland or the East San Francisco Bay Area of California, through a partnership with Sogorea Te' Land Trust, an urban indigenous women-led land trust, and Planting Justice, a food-justice nonprofit based in Oakland.

Keywords
Indigenous Food Sovereignty, Land Trust, Native Food Pathways, Traditional Ecological Knowledge (TEK), Food Justice, Land Access, Sacred Site Protection

History of the Ohlone People

The Ohlone people are the native people of the San Francisco Bay Area. Like all native peoples, their diversity is vast. The Ohlone lived in approximately 50 documented villages and extended family groups before the European

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Disclosure
Nicole Wires works for and is paid by Planting Justice, and Johnella LaRose is co-founder and employed by Sogorea Te' Land Trust, the organizations discussed in this paper.

invasion and spoke at least eight dialects of related languages. The Ohlone people share similar histories and a relationship to the diverse San Francisco Bay bioregion, but they have never constituted a single political or cultural entity. This diversity is reflected today in the broad spectrum of culturally and politically active Ohlone families and tribes (Sogorea Te' Land Trust, n.d.-a).

As with many of the California Native peoples, the Ohlone were forced into missions and residential schools and tortured under the reign of terror imposed by colonial empires, first from Spain, then from Mexico, and finally from the United States. Mission San Carlos in San Jose was established by Franciscan missionaries in 1769. These missionaries desired to convert all Indians into Catholic subjects of Spain. Survivors of the violence of missionization, which forced native people to abandon their languages and cultural practices, then faced extermination through the genocidal policies of the United States government, which paid settlers for scalps of Indian men, women, and children with the goal of eliminating California Indians entirely. Facing state-sponsored vigilante killings and virulent racial discrimination, many Ohlone families concealed their native identities, passing as "Mexican" or isolating themselves in order to survive. As a result, cultural and spiritual traditions were forced into dormancy or secrecy, and much knowledge perished with the passing of generations (Sogorea Te' Land Trust, n.d.-a). Corrina Gould, the spokesperson for the Confederated Villages of Lisjan and a co-founder of Sogorea Te' Land Trust, states that despite its progressive reputation, California has systematically strived to "totally invisibilize the Native Americans who lived here for thousands of years" (Aguilar & Wenus, 2018).

Since the beginning of colonial contact and continuing to the present day, the Ohlone have been denied the right to exist as Indigenous people. The U.S. federal government has refused to officially recognize the Ohlone as tribes, which denies access to reservations or protected land bases for the Ohlone tribes and the thousands of Ohlone people alive today, as well as to the rights, benefits, compensations, and protections afforded to Indians under treaties and centuries of federal Indian laws (Sogorea Te' Land Trust, n.d.-a). The benefits that the Ohlone are excluded from, in addition to reservations and land bases, include Indian Health Care services, federal scholarships, housing grants, and protections for cultural, burial, and sacred sites (Sogorea Te' Land Trust, n.d.-a).

The process by which unrecognized tribes can apply for recognition is called the Federal Acknowledgment Process, which is managed by the Bureau of Indian Affairs (BIA). Tribes must submit thousands of pages of evidence to prove who they are; criteria for recognition include demonstrating an unbroken continuity of leadership, tribal culture, and organization. The costs for presenting this proof are born entirely by the tribe. This standard is nearly impossible to achieve, given that California's Indian policy and the enslavement of California Indians in missions deliberately sought to dismantle the very continuity tribes are being asked to demonstrate. Ohlone tribes have submitted eight petitions for federal recognition since 1988, and not a single one has led to approval (Sogorea Te' Land Trust, n.d.-a).

In addition to Chochenyo and Karkin Ohlone people, the Bay Area is home to a diverse global Indigenous community as a result of the Indigenous diaspora that resulted from the U.S. government's Indian termination policies, as well as more contemporary diasporas resulting from global capitalism and empire through Latin America, the Pacific Islands, and across the globe (Sogorea Te' Land Trust, n.d.-b). Specifically, the Indian Relocation Act of 1956 was a federal law intended to encourage Native Americans in the U.S. to leave Indian reservations, acquire vocational skills, and assimilate into the general population. Part of the Indian termination policy of that era, which terminated the tribal status of numerous groups, the act played a significant role in increasing the population of urban Indians in succeeding decades.

Stemming from this diverse population of indigenous people in the East Bay Area who have been systematically dispossessed from their land, an innovative solution to urban indigenous land access was envisioned: Sogorea Te' Land Trust.

The Vision of Sogorea Te' Land Trust

Sogorea Te' Land Trust is an urban, intertribal,

Indigenous- and women-led land trust created to support Chochenyo and Karkin Ohlone, as well as other intertribal Indigenous people, in the Bay Area in order to gain title and legal access to land for sacred site protection, ceremony, and reclaiming indigenous food pathways and land stewardship. With the existence of the land trust, Sogorea Te' can acquire land through direct donation and title transfer from existing owners, or fundraising that allows for the purchase of land. Other legal mechanisms that protect access to land, including cultural easements, can also be granted. Sogorea Te' Land Trust names this process of returning land to the indigenous stewards "rematriation," recognizing the ways that native land stewardship also can undermine the patriarchal paradigm of capitalistic landownership and possession.

The vision of Sogorea Te' Land Trust is multiple, including to restore native land stewardship to the original inhabitants of the land, to restore native foodways and traditional ecological knowledge, and to create sacred space for ceremony to allow the Chochenyo and Karkin Ohlone people to carry out their sacred obligations from their creator on the land. Says Corrina Gould, a co-founder of Sogorea Te' Land Trust, "The land trust will also make it possible for us to relearn our traditional methods of taking care of the land. We can begin bringing back some of our traditional foods, like acorns. With that comes ways of taking care of the land such as [prescribed] burning. Burning also helps to bring back some of those native plants that were here before, so that we can bring back the basket weaving, that we can bring back the medicines that were always here, that we can begin to teach ourselves how it is that we are supposed to live on this land again" (Sogorea Te' Land Trust, Our Vision, n. d., para. 13).

Additionally, with legally protected access provided by a cultural easement, Sogorea Te' Land Trust will enable Indigenous people in the Bay Area to have influence over decisions made by land-use managers on public lands. "There's a lot of open space parks in the Bay Area, set up for recreation. With the land trust, we would like to establish cultural easements on those lands so that we can practice our cultural belief systems, protect our sacred places, and actually have a voice over what happens there. We are not a special interest group, like many park districts or parks often assume—we are the original caretakers of this land. With easements, we could actually have a say—an equal say—in what happens on those lands," states Gould (Sogorea Te' Land Trust, n.d.-b, para. 14).

The land trust envisions building spaces for community engagement, including community gardens for local native food sovereignty, on some urban parcels of land that can be acquired through the trust. As Johnella LaRose, another co-founder of Sogorea Te' Land Trust, says, "In the Indian community, we're in a crisis around food, and we have no place to grow this food. There are many community gardens in the Bay Area, but the native community does not have one. We *do not* have one. We need that kind of space to grow food, spaces where everybody could come and gather—safe space for young people, children, and families to be" (Sogorea Te' Land Trust, n.d.-b, para. 15). Adds Gould, "Getting back to traditional and sustainable foods is also important for us because as native people, we have some of the highest rates of diabetes and heart disease and all of these other horrible things that came with western culture. By going back to our original food sources, we can start reversing that. We can heal ourselves with the food that was always here for us" (Sogorea Te' Land Trust, n.d.-b, para. 17).

The lack of access to traditional ceremonial grounds and to land appropriate for multiday ceremonies is a troubling challenge faced by Ohlone people today, since the tribes remain without land in the Bay Area. A cornerstone of Sogorea Te' Land Trust's vision is the construction of a traditional Ohlone roundhouse in the East Bay area that would welcome all Ohlone families and bands, acting as a space for healing and spiritual renewal. A roundhouse would be a spiritual center for the Ohlone people in the East Bay, allowing them to enact the obligations they have from their creator; as Corrina Gould says, "to sing and dance our songs here to heal the land" (Dalmas, 2018).

Partnership with Planting Justice

With this righteous vision in place, Sogorea Te' Land Trust formed a partnership in 2017 with Planting Justice, a food-justice nonprofit based in

Oakland with a mission "to empower people affected by mass incarceration and other social inequities with the skills and resources to cultivate food sovereignty, economic justice, and community healing" (Planting Justice, n.d., para. 1). Founded in 2008, Planting Justice creates meaningful, living-wage jobs in the sustainable food system for youths and adults impacted by incarceration. It operates a permaculture landscaping company, an organic-certified commercial nursery, an urban farm and orchard that serve as the mother farm for the nursery, and a grassroots canvassing team. In 2016, Planting Justice acquired 2.5 acres (1.0 hectare) of land in East Oakland for the operation of its commercial nursery, Rolling River Nursery.

Through relationship-building, Planting Justice and Sogorea Te' Land Trust entered into an agreement to grant a cultural easement, and eventually to transfer full title, of the land operated as the Rolling River Nursery in East Oakland. Currently, Planting Justice owes debt on the land through a mortgage; however, once it is paid off, Planting Justice has committed to transferring title of the land to Sogorea Te' Land Trust, with an agreement to lease back the land to operate Rolling River Nursery. Additionally, a cultural easement will permanently protect the back quarter-acre (0.10 ha) of the property as an Ohlone cultural site, no matter who owns the land in the future. On this quarter-acre, a traditional arbor and fire pit are being built to create space for traditional dances, and native and traditional medicinal and basket-weaving plants are being planted for cultivation and reclamation of ancestral foodways and land stewardship practices. Under this structure, both organizations will work on the land, with Sogorea Te' Land Trust having final control over land use and operations (G. Raders, personal communication, January 2018).

With unimpeded and protected land access, the Chochenyo and Karkin Ohlone people can begin the true path to community healing, wellness, land stewardship, and food sovereignty.

> This land trust is a way for us as human beings to come back to being human beings. A way for us to learn how to treat each other with respect. A way for us to re-envision the Bay Area. We can create a healing for the people that are here. Not just the Ohlone people, but all people that exist on this land.
>
> —*Corrina Gould* (Sogorea Te' Land Trust, Our Vision, n. d., para. 22)

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COMMENTARY

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Fighting for the taste buds of our children

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Abstract
In this commentary, I focus on the impacts of Indian boarding school food on American Indian foodways and community as a source of acculturation that has a lasting effects even in the present day. From the introduction of specific foods that now make up the modern diet of many American Indian communities, to the generational cycle that begins *in utero,* the taste buds of American Indian children are still subject to the "American Indian Boarding School experiment" that began in the late 1800s. Only American Indian communities can determine when that experiment stops.

Keywords
American Indian Foodways, Nutrition, Indian Boarding Schools, Children's Food Preferences, Indigenous Food Systems

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Introduction
This commentary is informed by my experience in the backyard of my grandmother's home in front of an old steel stove that she used in summertime to cook all the family meals. The stove was gifted to her from her mother, my great-grandmother. My great-grandmother received the same stove from her father, Cyrus Dickson, who was one of three Cochiti students who attended Carlisle Indian School in Carlisle, Pennsylvania. He attended from 1881 to 1887. The stove required that its firewood be cut into small pieces and had plates that my grandmother lifted to control the temperature. It was very much like the stove she used in home economics classes when she was a student at Santa Fe Indian School in the 1930s. My great-grandmother was one of the first ladies in the village to have a steel stove. She cooked blue corn tortillas, posole, dried jerky, and a wide range of other foods on that stove for both the family and the community. While researching the journey of my great-great-grandfather and the journey of countless American Indian children who were sent to Carlisle Indian School, I came across pictures of well-

dressed students sitting at formal dining tables with white tablecloths and candles, a far cry from any meal I ever had as a child in Cochiti, a subsistence agricultural community that is centered on traditional Pueblo agriculture. In wintertime when it was too cold to cook outside, my grandma would be forced to use the indoor gas stove, and the steel stove outside would be covered in a thin layer of ice waiting to be re-ignited. The stove was modern, but it required wood and fire to be functional. It came to remind me of my great-great-grandfather's journey. One summer night, my grandmother asked me what I would like of her possessions upon her passing. Without hesitation, I asked for the stove.

Thirty years later, I was working at First Nations Development Institute with Indigenous communities on community food projects. First Nations Development Institute has been supporting community-based food and agricultural projects throughout Indian Country since 2007. Through grant programming, over 305 American Indian community-based food projects that focus on community gardens, healthy eating, traditional foods, food policy development, health promotion, nutrition education, and community agricultural education programs have been supported. Each program has submitted written reports on its challenges, insights, and findings. Working in this space since 2007, I have found that there are similarities, trends, and consistencies that have emerged in this field. While the communities have varied in geography, region, language, and culture, their challenges seemed to be wholly consistent.

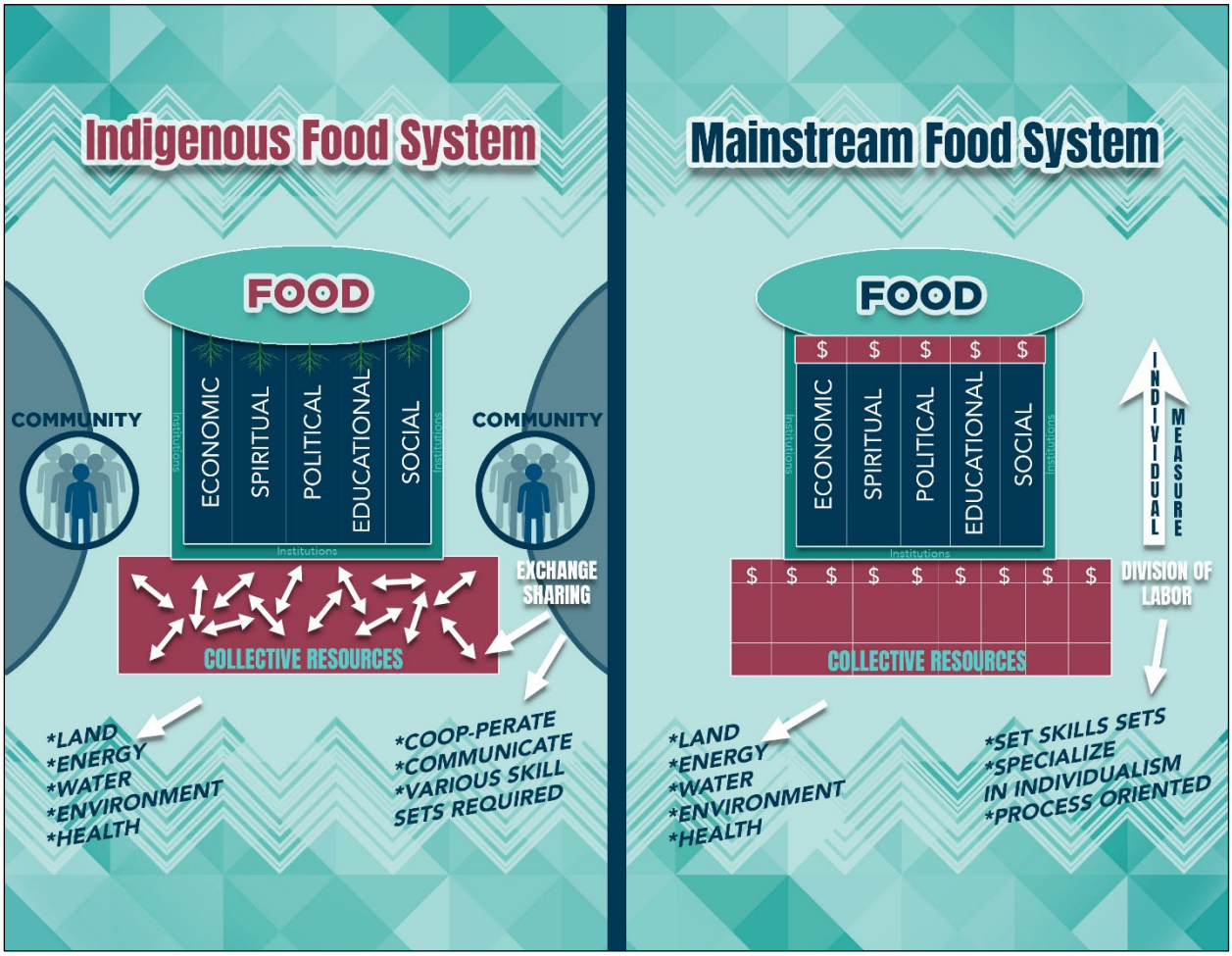
Food in Indigenous Society and the Impact of Boarding Schools

Food and its role in Indigenous community and society are critical in understanding the changes within that community and society once a diet is changed. First Nations Development Institute, a national nonprofit, has been funding Native food and agriculture projects throughout the United States since 2007. Through the development of this work portfolio and with input from over 300 Indigenous communities over the life of the initiative, First Nations Development Institute has developed a model of an Indigenous food system that is generally described here in Figure 1.

Generally, food is an integral Indigenous societal "sensor" in that it is closely tied to basic societal institutions in Indigenous communities. In historical times, Indigenous communities were directly tied to their food sources because their society was organized around the growing, harvest, and hunting seasons. Clans, families, and entire communities were organized in ways to optimize access and regulate food to ensure that the land, plants, animals, fish, and water were harvested in balance for continued growth of the community (Cajete, 1999). In economic institutions, food was used as a valued product that could be traded internally within the community and externally outside of the community. Extensive trade routes were established that allowed intratribal and intertribal trade to thrive (Swentzell & Perea, 2016). These trade routes were based largely on food items. In spiritual institutions, Indigenous communities tie many of their first foods to creation stories and frequently time ceremony with food seasons based on times for hunting or gathering or harvesting of food (Cajete, 1999; Kimmerer, 2013; Swentzell & Perea, 2016). In political institutions, food was often managed by clan or familial systems so that there was some accountability of consumption and redistribution (Cajete, 2000). Political leadership and appointments were pulled from roles within the food system. In educational institutions, some of the first lessons young Indigenous children were taught were based on food, whether it be through the recital of creation stories that may have included important foods or whether it be environmental understandings through food gathering, hunting, or harvesting (Cajete, 2000). Lastly, social values were taught through food, whether it be the understanding of certain foods to be used for specific occasions, sharing, cooking, or using food as a social behavior re-enforcement.

Because of the close ties to food sources, Indigenous people often understand the growth cycles of food. All elements that sustain these cycles are collective resources. These elements are intergenerational knowledge, water, land, human and animal interactions, sky, and physical ability to cultivate. The elements belong to no one; they produce foods, a basic necessity of existence. For

Figure 1. Indigenous and Mainstream Food Systems Compared



Created by A-dae Romero-Briones, First Nations Development Institute.

example, corn cannot grow without human or animal interaction, sunlight, water, and earth. These environmental and external sources are the basic elements of creation that are viewed as shared resources and are available for everyone to utilize in order to grow the corn. Because of the recognition of collective resources, community and individual interactions become pivotal in a well-functioning society (Cajete, 2000). Cultural norms, social norms, and basic understandings of community are centered on communication skills that are often encoded into ceremony, relationships, and community gatherings (Cajete, 2000). Presence and participation are of utmost importance to understanding and purposely managing collective resources (Cajete, 2000). If the societal institutions are functioning properly and collective resources are available and managed properly, the members of the community ideally will have access to food. In short, participation and interaction in the community blossom into an Indigenous food system.

While the nature of food has changed over time, food as an indicator in an Indigenous society largely remains the same in that it can be used to determine the health and relevance of a societal institution. The system of American Indian boarding schools did much damage in every one of the basic institutions that made up Indigenous society, but most scholarship focuses on the educational institution. Extracting children from their Indigenous food system essentially creates individuals devoid of an understanding of their land, environ-

ments, political systems, education systems, and spiritual systems, and no understanding of collective resource management. Essentially, that is what the American Indian boarding school system aimed to do—acculturate Indigenous children into "their allotted role" in American society and "stamp out all things indigenous" (DeJong, 2007, p. 257), including their relationships with their families, communities, lands, and foods. As a result, the taste preferences of Indigenous children transformed from one based on traditional food systems with live connections to community and place to one that is transformed by military science and diet that was dependent on fat, sugar, and carbohydrates. Presently, the boarding school diet prevails in almost every Indian community, is a primary source of chronic health conditions, and is one of the larger barriers to establishing healthy diets and community-determined food systems in Indian Country.

Children's Food Preferences

Prior to contact, Indigenous communities had established food systems that were imbedded in their regions and environments. Diets within a given community were quite similar, if not identical, thus allowing the community to build institutions upon these food systems that reflected the values of the community to establish cultures in tune with land, environment, and the human existence within that environment. Culture, defined broadly, is "the characteristic features of everyday existence (such as diversions or a way of life) shared by people in a place or time" ("Culture," n.d., para. 2). Indigenous children born to Indigenous communities usually became members of their community through ceremony, family, community, and, ultimately, participation in the very food system that sustained their mothers during pregnancy and prior generations. This cycle of creation, re-creation, and maintenance of both the community and environment was the mainstay of Indigenous life.

Children, while in utero, were already learning to "taste" the nature and character of their food system, community, environments, and were being prepared to participate in them as consumers of the foods that are the epicenter of that system. Dr. Julie Mennella, a researcher who studies in utero and infant tastes, states, "Each individual baby [within the womb] is having their own unique experience, it's changing from hour to hour, from day to day, from month to month. As a stimulus, it providing so much information to that baby about who they are as a family and what as the foods their family enjoys and appreciates" (Cuda-Kroen, 2011). In Indigenous communities, food preferences were also reflective of the community that is embedded in a particular environment. In short, pregnant women in Indigenous communities consumed what was readily available in their Indigenous food system, exposing children to the tastes that would tie their human necessities to the perpetuation of their Indigenous society. This process also continued after birth.

One of the most critical periods of growth and learning is early childhood. All senses are fully active, allowing the child to learn about their world, family, environment, and society. Understanding the environment through food is an essential base of knowledge that allows Indigenous children to understand how their community and society is structured. Traditional foods coincide with specific seasons, which in turn, reflect lessons about resource management, allowing children to witness the managers and societal structures around that management. Mennella further explains that, "In other words, characteristic flavor of the formula experienced in early life is 'imprinted' and remains as a preference for considerable time" (Beauchamp & Mennella, 2011, p. 3). Taste and food become an important base for understanding throughout an Indigenous child's lifetime.

Additionally, taste and exposure to foods that support the Indigenous society become a critical measure of individual health. Beverly Cowart (1981) states that taste acts as a bodily regulatory process, noting that "specific taste preferences are undoubtedly important in the regulation of food intake" (1981, p. 57). A child who "grows" their tastes that derive from their environment that is fundamental to their family, community, and society then becomes a critical participant in all those structures, which are then perpetuated by the child's health. While the growth of "taste" begins even in utero, there are critical periods of taste and

preference influence, one of those times being the tastes introduced in utero and another of those times in adolescence (Garb & Stunkard, 1974).

Research suggests that there are stages in young adolescence when individuals begin to develop their own preferences, particularly in periods of increased independence and greater susceptibility to peer influence. "There is suggestive evidence that late childhood/early adolescence may be a particularly interesting period in the development of taste preferences" (Garb & Stunkard, 1974, p. 67). This confirms more recent studies that identify perceived taste sensitivities at different age categories. These category differences are in young adult, young-old, and old-old populations (Yoshinaka et al., 2016). While the physical and physiological changes occur in adolescents' perception of tastes, they are also at a period when they are developing adult dietary habits. Johnson (2016) states, "Indeed, the few longitudinal studies that assess children's food preferences suggest that food preferences acquired during early childhood carry on into adolescences and predict the quality of diet in adult years" (p. 221S). In short, adolescence is not only a period of physical transition but also social transition, and is a critical transition period of childhood dietary patterns into adulthood.

Figure 2. A Facebook Post Dated January 8, 2019, in a Group Called "Fry Bread Factory," Described as a Page "Created for the 7th Generation and All Our Relations"

Thus, American Indian boarding schools of the 20th century have had a slow, but targeted and steady impact on the transformation of Indigenous foodways. This transformation is still slowly grinding along, and its impacts are clearly visible in our community today.

Indeed, as a result of boarding schools and federal Indian policy, the present-day diet for Indigenous communities is uniformly unhealthy. Every community has a version of fry bread, the product of mixing white flour and sugar and frying it in lard, all ingredients that are rampant in Indian boarding school classrooms (see Figure 2). Every federally recognized tribe has some access to the federal feeding program, the Food Distribution on Indian Reservation Program, which only further standardizes the Indigenous diet and palate. Furthermore, the cooking skills and the expectation of behaviors around food and meals taught at boarding schools are still widely practiced in Indigenous homes across the country.

One of the prime areas of current health research in American Indian communities is diet. Story et al. (1999) state, "Obesity has become a major health problem in American Indians only in the past 1-2 generations and is believed to be associated with a relative abundance of high-fat foods and the rapid change from active to sedentary lifestyles" (Story et al., 1999, p. 747S). The study described the dietary practices that were identified as contributing to obesity. These included the consumption of butter, lard, whole milk, fry bread, fried meats and vegetables, and the generous use of fat in beans (Story et al., 1999). Not coincidentally, the foods mentioned are the same foods provided for in the 1776 army ration box and were the same foods used to feed students in American Indian boarding schools. The diet of the American Indian boarding school was so ingrained because of acculturation that students returning home took those taste preferences and dietary practices into their community, leaving taste preferences and dietary practices that have lasted for generations.

In a more recent study on food perceptions and dietary behavior of American Indian children, Gittelsohn et al. (2000) found that there was a high level of consensus and a single cultural model of diet that consisted of "an abundance of high-fat, high-sugar foods" (p. 1) despite the geographic variability of the study. The researchers were surprised that few traditional foods were even mentioned by the children in the study (Gittelsohn et al., 2000). They note,

> This assessment employed a combination of qualitative and quantitative methods (including direct observations, paired-child-in-depth interviews, focus groups with child caregivers and teachers, and semi structured interviews with caregivers and food service personnel) to query local perceptions and beliefs about food commonly eaten and risk behaviors associated with childhood obesity at home, at school, and in the community. An abundance of high-fat, high-sugar foods was detected in the children's diets described by caregivers, school food-service workers, and the children themselves. (Gittelsohn et al., 2000, p. 1)

They further found that despite being in six different communities across the nation, the children showed "remarkable consistency in their selection of salient foods and how these foods should be grouped" (Gittelsohn, 2000, p. 11). In the study, the most frequently mentioned foods included hamburger, soda pop, tacos (frequently referred to as Indian tacos) (Gittelsohn et al., 2000, Table 2). Another study of Mohawk children in Akwesasne, New York, found that their diets exceeded recommended intakes for energy, fat, and saturated fat (designated as Fat, Protein, and Carbohydrates) (Harvey-Berino et al., 1997, p. 4). While the American Indian boarding school experience has largely been condemned publicly, with survivors addressing long held emotional traumas, the diet introduced to Indian children in these schools persists.

Impacts of Contemporary Diet

Presently, there are 573 federally recognized tribes in the U.S. with a total population of 2.9 million (National Congress of American Indians, n.d.). There are many studies that recount the health disparities of Tribal communities. The Indian Health Service (2018), the federal agency responsible for providing health care delivery, states,

> The American Indian and Alaska Native people have long experienced lower health status when compared with other Americans. Lower life expectancy and the disproportionate disease burden exist perhaps because of inadequate education, disproportionate poverty, discrimination in the delivery of health services, and cultural differences. These are broad quality of life issues rooted in economic adversity and poor social conditions.
>
> Diseases of the heart, malignant neoplasm, unintentional injuries, and diabetes are leading causes of American Indian and Alaska Native deaths (2009-2011).
>
> American Indians and Alaska Natives born today have a life expectancy that is 5.5 years less than the U.S. all races population (73.0 years to 78.5 years, respectively).
>
> American Indians and Alaska Natives continue to die at higher rates than other Americans in many categories, including chronic liver disease and cirrhosis, diabetes mellitus, unintentional injuries, assault/homicide, intentional self-harm/suicide, and chronic lower respiratory diseases.
>
> Given the higher health status enjoyed by most Americans, the lingering health disparities of American Indians and Alaska Natives are troubling. In trying to account for the disparities, health care experts, policymakers, and tribal leaders are looking at many factors that impact upon the health of Indian people, including the adequacy of funding for the Indian health care delivery system. (para. 2–5)

The statement summarizes the current state of health in American Indian communities often linked to diet, the diet that was introduced to American Indian children in boarding schools and has since become the preference across communities. In the Akwesasne study, the major finding was that food preferences are the strongest predictor of

reported eating behavior in very young children and such a finding has strong implications for behavior change interventions (Harvey-Berino et al., 1997). Ironically, the study is almost suggesting that the very same systematic intervention, institutional introduction of specific foods, that was deployed in American Indian boarding schools on American Indian children to disrupt connections to traditional food systems and community in the first place should be used presently to increase intakes of healthier foods.

Re-Educating Our Taste Buds

While education curriculum and academic subject matter have been re-envisioned to empower American Indian children in Indigenous communities, few movements or strategies have actively focused on taste preferences of Indigenous children. Some of the initial projects around food began as early as 1997 with the Day Break Farming and Food Project in the Iroquois Six Nations. In 2007, First Nations Development Institute initiated the Native Food and Agricultural Initiative (NAFSI) to support community food projects throughout Indian Country. Since NAFSI began, over 305 food and agricultural projects have been supported in the program. Many of the projects funded are community gardens, food policy work, propagation of traditional foods, and agricultural production skill-building in Indian community. Only a handful of those projects focus on "taste preferences" or the embracing of traditional food in the curriculum of tribally based schools or programs. Some of the most prominent and thoughtful programs that are working to reintroduce food into education are the Keres Children's Learning Center (KCLC) in Cochiti Pueblo, New Mexico, and the Akwesasne Freedom School in Hogansburg, New York.

The KCLC, the first Indigenous heritage language Montessori school, uses a holistic approach to language education. Its guiding principles are:

- KCLC practices traditional Cochiti beliefs about food, food preparation, eating, serving, and exercise.
- KCLC believes it is important to train children's minds and palates through good nutrition and cooking experiences at school, preparing and tasting healthful alternatives to unhealthy foods.
- KCLC supports families in developing healthy eating habits.
- KCLC provides children with authentic opportunities for movement and other physical activities that will help prevent future health problems such as diabetes, obesity, and coronary disease. (T. Moquino, personal communication, January 2019)

KCLC has consciously incorporated diet and traditional, social, and cultural practices around food, and acknowledges the relationship between education, food, and societal institution-building. It focuses its efforts on the concept that traditional values, community, and Pueblo lifeways support the healthy development of children in daily life. Trisha Moquino (Cochiti/Santo Domingo/Ohkay Owingeh), co-founder of KCLC, says, "Our cook often cooks traditional foods from 500+ years ago to what has become traditional in terms of using more beef, pork, and chicken with the intro of what Spanish brought" (Moquino, T., personal communication, January 2019). Founded in 2006, KCLC has promising results, but more importantly, it has purposefully re-instituted a learning environment reflective of the community and educated children in the tenets, environments, foods, and cultural and social values of the community.

Similarly, Akwesasne Freedom School was created to perpetuate Mohawk lifeways. Its mission is to "create a place for wholly Mohawk education." Founded in 1979, the school founders consciously founded the school to rebuild the nation and reverse the assimilation process (Sargent, 2007). For example, the school day begins with the *Ohen:ton Karihwahtekwen* (words that come before all else: thanksgiving address) which is a traditional practice that acknowledges a respect for all things, most notably some of the traditional foods and practices around those foods. Additionally, the school garden is a critical classroom where students grow, eat, and maintain the garden daily, and where they learn traditional medicinal plants and reflect on relationships between their natural world and human interaction. These skills and experiences are reflective of a nation's institution-building, the very

experiences and skills the Indian boarding school diet has sought to weaken.

Conclusion

Indigenous communities are often the subject of deficit-based health and education studies that document the incredible disparity that we face daily in Indigenous communities. What is not documented is the resilience, the strength, the beauty, and the happiness that are still alive and well in these communities. While some connections to the past and pre-contact lifestyle are fleeting, the base of that system remains intact as demonstrated through the many projects that focus on traditional lifeways, diets, community gardens, and food systems. Research on obesity and diabetes often focus on the individual actions that patients can take to address a health crisis widely spread throughout Indian Country; however, that may be another version of the assimilation process—separating the individual from the community. A prime cause of such health disparities, the diet, was purposefully introduced to create soldiers out of American Indian children. Coincidently, American Indians serve the military at higher than average rates, which is a testament to the effectiveness of the great American Indian education experiment conducted by Henry Pratt (the founder of Carlisle Indian Industrial school), which sought to indoctrinate American Indian students in the whole of American citizenry through military regiment—from diet to values. As new generations of American Indian students arise, we must just as purposefully decide when the experiment ends.

Trisha Moquino started KCLC in 2006, after years of teaching in public schools and Bureau of Indian Education schools. After having two daughters who attended local schools for years, she thought deeply and critically about what kind of education she wanted to provide for her two Pueblo daughters. KCLC was borne out the love for her children, her community, and an unknown hope for the future all Cochiti children. In the same way, American Indian communities across the country must think critically and deeply about the history, loss, love, and hope we have for all Indigenous children. We must build schools, education programs, community gardens, and experiences that allow our children to experience the world that begins with the taste of our community, environment, connections, and history. While it may seem like an insurmountable issue to address, it can all begin with one meal.

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COMMENTARY

Special JAFSCD Issue
Indigenous Food Sovereignty in North America
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Building an Indigenous foods knowledges network through relational accountability

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Abstract
In recent decades, there has been a movement toward rectifying injustices and developing collaborations between Indigenous communities and mainstream researchers to address environmental challenges that are of concern to Indigenous Peoples. This movement, primarily driven by Indigenous community leaders and scholars, emphasizes community-driven research that addresses Indigenous People's interests, foregrounds Indigenous Knowledge systems, and both respects and asserts Indigenous sovereignty. This article describes a

nascent model in the movement—the Indigenous Foods Knowledges Network (IFKN)—designed to connect Indigenous communities and scholars across the Arctic and the U.S. Southwest. IFKN's goal is to foster a network of Indigenous leaders, citizens, and scholars who are focused on research and community capacity related to food sovereignty and resilience. IFKN members collectively work to promote and carry out research that (1) utilizes Indigenous research processes, (2) embraces and respects Indigenous Knowledge systems, and (3) supports Indigenous communities (IFKN, 2018). The authors discuss relational accountability and centering of story, which form the foundation for the methodological approaches and work of IFKN.

Keywords
Indigenous Food Sovereignty, Governance, Arctic, Indigenous Knowledge, Networks, U.S. Southwest

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Introduction

Indigenous Peoples' homelands in the Arctic and U.S. Southwest are undergoing unprecedented environmental change posing risks to their food systems. These changes follow and accompany massive social and cultural disruptions that occurred and continue to occur as a result of settler colonialism. Efforts to extinguish Indigenous cultures over the last four centuries have largely failed due to the resilience of the peoples and their lifeways. Indigenous communities worldwide are working to revitalize their food systems and assert their food sovereignty. However, the role of mainstream science in the erosion of Indigenous rights and the tendency for non-Indigenous researchers to diminish Indigenous ways of knowing complicate efforts to bring Indigenous and non-Indigenous Knowledge systems into dialogue to address these risks. In recent decades, there has been a small but growing movement to rectify some of these injustices and develop respectful collaborations between Indigenous communities and

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researchers to address complex environmental challenges. This movement, primarily driven by Indigenous community leaders and scholars, emphasizes community-driven research that addresses Indigenous People's interests, foregrounds Indigenous Knowledge systems, and both respects and asserts Indigenous sovereignty (see Gupta, 2015; Huntington & Watson, 2012; Inuit Circumpolar Council Alaska, 2015; Inuit Tapiriit Kanatami, 2018; Ittaq Heritage and Research Center, n.d. ; Johnson, Rowe, Lien, & López-Hoffman, in press; Kukutai & Taylor, 2016; Paganelli Votto & Manuel, 2010; U.S. Indigenous Data Sovereignty Network, n.d.).

This commentary describes one nascent model, the Indigenous Foods Knowledges Network (IFKN), designed to employ the values and methodologies of Indigenous research to connect Indigenous communities and scholars (both Indigenous and non-Indigenous) across the Arctic and the Southwest. IFKN's goal is to foster a network of Indigenous leaders, citizens, and scholars to collectively promote and carry out food sovereignty and resilience knowledge development that (1) utilizes Indigenous research processes, (2) embraces and respects Indigenous Knowledge systems, and (3) supports Indigenous communities (Indigenous Foods Knowledges Network [IFKN], 2018).

IFKN emerged from a U.S. National Science Foundation Research Coordination Network (RCN) grant designed to bring together diverse experts to discuss new ideas and pathways that can be built upon in future projects. A research coordination team from the University of Colorado and the University of Arizona wrote the project proposal and assembled a steering committee composed of nine Indigenous scholars and community leaders from the Arctic and the Southwest. This commentary is the result of gatherings convened in both regions over the last year and is a collaborative output of the steering committee and the research coordination team with input from the broader Network.

What follows is an exploration of some of the emerging ways in which two elements of Indigenous methodologies—relational accountability and centering of story—are fundamental to both the goals and process of IFKN. As we discuss, this is reflected in the initial gatherings of the network partners and its resulting charter. In doing so, we provide an example of how grounding efforts in Indigenous Knowledge systems, asserting Indigenous data sovereignty, and utilizing Indigenous methodologies might support Indigenous food sovereignty broadly and create scholarship that is just, equitable, and accountable to those communities.

A Network Based on Relational Accountability

The concept of "relational accountability" reflects the centrality of relationship to Indigenous methodologies and knowledge systems (Wilson, 2008, p. 97). Relationships—between individual people, among human collectives, between people and Creation (e.g., earth, waters, animals, plants), and with the spiritual realm—provide the foundations upon which Indigenous Knowledges and worldviews are based (Absolon, 2011; Kovach, 2009; Lambert, 2014; Smith, 2012; Thomas, 2005). These knowledges, including about food, are often shared and expressed in the form of stories to transmit knowledge and worldviews across generations (Basso, 1996; Chilisa, 2011; Kovach, 2009; Lambert, 2014; Thomas, 2005). Indigenous storytelling is a powerful method of transmitting knowledge about how to relate to people and Creation and is also important to transmission of Indigenous languages and subtle modes of expression.

IFKN steering committee member Shawna Larson (Ahtna and Supiaq) offers this story as an example of relational accountability, which she has shared at two IFKN gatherings:

> *Several years ago, I was at a Tribal Council meeting and one of the elders brought up the fact that in a lot of United States government documents they were using the term "subsistence." He opened the dictionary and read us the definition for subsistence: "the source from which food and other items necessary to subsist are obtained." This definition didn't capture the relationship or the meaning of our way of life. As traditional people, we know that the land and the people are inextricably linked and that we have a very strong relationship with the land and animals. So, he asked me if I would be willing to help find a more traditional word to use.*

I thought that it would be pretty easy to find a substitute word, and I figured that other Tribes would have something already written up on it. If not, I figured that I could always just ask our elders what the word in our own traditional language was. So, I agreed to take on the task and spent some time on the internet, trying to find other Tribes that had done this work. I spent a few weeks researching it, but I wasn't able to find anything that captured the meaning that I was looking for.

Next, I decided to check in with our elders. After several conversation with elders, in which I received answers like "Subsistence is when the berries are ripe, when the fish have arrived, when it's time to hunt moose," I realized that these phrases were not really what I was looking for to express our understanding of "subsistence."

A few months later, I was at a Federal subsistence board meeting with a Yup'ik elder with whom I had worked with in the past. I thought: maybe in the Yup'ik language they will have a different way to say this. I asked him, and it was so fascinating because his response was exactly the same as what my elders had said. "When it's time to hunt the seal, when it's time to pick the berries." I said, no that's not really what I meant. He chuckled at me—I'm sure he could see my frustration. I held up both my hands and pointed to my left hand and said, "if this is the land and the animals. …" And I held out my right hand and pointed and said "and this is the people…" And I clasped my hands together and said: "How do we say this?"

And he said "Oh! There is no one word to describe what you're talking about because what you're talking about is a relationship, and in order to understand relationships, we told stories. We told stories because stories make you feel. And feeling is the only way to really describe the responsibility and the relationship that you're talking about with the land, with the animals, and our way of life." I was so struck by his words and all at once, it all made so much sense to me. Our traditional stories are how we taught our children to behave and have morals, values and respect.

I felt sad that there was no words in English to describe something so important to us. But in the end, I know this relationship and responsibility is something our traditional people have always known and we carry it in our hearts with us wherever we go.

Placing relational accountability and storytelling at the center of IFKN has profound implications for how the Network formed and continues to evolve. One of the most significant ways the Network format facilitates this process is through an emphasis on place-based gatherings. Network gatherings, held once or twice a year, are hosted by Indigenous organizations in Indigenous communities, alternating between the Arctic and the Southwest. Hosts identify relevant projects that are supporting food sovereignty within the community and arrange visits as part of the gathering.

IFKN steering committee member Althea Walker (Akimel O'otham) and the Gila River Indian Community Department of Environmental Quality hosted the first IFKN gathering on March 1 and 2, 2018. Walker and the research coordination team consciously designed the gathering to break down inequities in research relationships that often privilege mainstream scholar voices and ways of knowing. For example, because open-ended conversations foster genuine connections between people, the meeting had a flexible agenda in which participants had ample time to share stories and food, identify goals, and define priorities for the Network. The initial gathering also established relationships that facilitate the remote work necessary to continue building the Network between in-person meetings. Reflecting on the workshop, Walker notes:

To have the first IFKN meeting on the traditional homelands of the Akimel O'otham and Pii Paash was an honor and a privilege. We were given the opportunity to share our story and provide the Network a firsthand experience of our fight to protect our traditional food and knowledge systems. We've always been farmers, hunters, and gatherers, but when our lifeline, the Gila River, was diverted from our homelands, we were stripped of our traditional diets, making way for famine and disease. It took many years and multiple generations of families to fight and bring back the water to the homelands of the Akimel O'otham and Pii Paash. With the return of the water, our first foods are returning and we are able to share our stories with our

younger generations through tangible experiences. Hosting the first IFKN meeting, we were able to share our story of how we're rebuilding our ancient irrigation systems, bringing back our traditional foods, and rebuilding our relationship with the land and animals.

Subsequent Network gatherings affirmed the importance of building relationships among the people who constitute IFKN and with the Indigenous homelands that give them strength. Meeting hosts identify places and activities that allow participants to connect with the physical aspects of food, like growing and harvesting, and with ecological and spiritual dimensions of place. At a gathering in March 2019 on the Tohono O'odham Nation, steering committee member and host Amy Juan arranged for the group to visit Waw Gi'wulk, a mountain that is a sacred place for the Tohono O'odham people. The visit created a powerful sense of connection to the land and Spirit among participants, and a closer connection among Network members who hiked, ate together, and exchanged stories about edible plants and food traditions.

Indigenous Foods Knowledges Network: Processes and Guiding Principles

Following the first IFKN gathering, members of the steering committee and research coordination team drafted a charter with input from the broader Network (IFKN, 2018). The charter articulates the collective vision of IFKN, establishes foundational principles for the Network's work, and lays out initial goals.

Indigenous Foods Knowledges Network Guiding Principles

- At its core, IFKN serves to support and promote Indigenous sovereignty.
- Research by and with Indigenous Peoples should prioritize community-centered, action-oriented frameworks and foster hands-on exchange of knowledge.
- Indigenous languages are a critical component of food and knowledge sovereignty.
- Demonstrating respect for Indigenous Knowledge systems is a central tenet of IFKN.
- Indigenous communities have authority over research projects that affect them.
- Community concerns over Indigenous foods, seeds, air, lands, and waters, plants, and animals must be identified, recognized and respected when developing partnerships.
- Data are powerful tools for Indigenous communities when they reflect core values.
- Partnerships demand ethical relationships (IFKN, 2018, pp. 2–4).

These principles reflect the centrality of relational accountability and story in the IFKN operating framework, emphasizing respect for Indigenous Knowledge systems and highlighting ways to support Indigenous Knowledge sovereignty, including Indigenous food knowledges.

From Principles to Action: Network Goals

The IFKN Charter also delineates goals to orient collaboration and support our work together. Like the principles, these goals were derived from conversations at the inaugural Network meeting. The goals are (1) take action!, (2) connect across generations, (3) engage Indigenous scholars, (4) support Indigenous Knowledge systems as defined and represented by Indigenous Peoples, (5) support Indigenous research and data governance, (6) advocate for ethical research and data partnerships, (7) work across multiple scales, and (8) establish a Network of Networks (IFKN, 2018, pp. 4–5).

The provocation, *To whom are we accountable in our research?,* summarizes the relational accountability interwoven through the principles and goals. The goals also reflect the Network's interest in facilitating collaboration to reorient both research and practice on Indigenous foods in support of Indigenous sovereignty.

Anticipating and Responding to Challenges

While IFKN is still in its formative stages, we have already engaged with challenges related to enacting the principles of relational accountability in the way that we interact with Indigenous communities.

Recognizing that Indigenous communities,

organizations, and representatives have high demands on their time, it is important to approach them with attention to what IFKN offers in return. With each step we are conscious to consider the following questions: (1) How might involvement in this Network benefit the community? (2) How can Network gatherings be organized to ensure meaningful connections between visitors and hosts? (3) How can we ensure that all participants (hosts and visitors) come away with a better sense of their goals and challenges in relation to food sovereignty?

Breaking down power imbalances in Network processes and being inclusive are related challenges. Academic researchers submitted the proposal, administer the grant, and coordinate the Network to keep the administrative burden off Indigenous community partners. This raises the question of whether this structure reflects the inclusivity that the Network aims to foster. Ensuring that active Network members are compensated for their time and effort—to the extent possible within a grant—is one way we are trying to bridge this gap.

IFKN is, and will continue to be, challenged to remain true to relational accountability. IFKN as a collective, and its individual members must continue to explore ways to build be in service to and in ongoing relationship with the communities that are working to strengthen foodways, food sovereignty, and data governance. Given the recent emergence of IFKN, the ways in which such relational accountability will develop remains uncertain. The answer will emerge from relationship-building and a commitment to accountability over the coming years. We will navigate these and challenges we cannot anticipate by learning from existing Indigenous networks and drawing on the experience and wisdom of IFKN members.

Where Do We Go From Here?

IFKN is designed to employ the values and processes of Indigenous research to connect Indigenous communities and scholars across the Arctic and the Southwest U.S. IFKN is an example of what Peter Reason refers to as "building democratic, participative, pluralistic communities of inquiry" (2003, p. 109) that embrace "ways of knowing that go beyond the orthodox empirical and rational Western epistemology, and which start from a relationship between self and other, through participation" (p. 111). In this process, knowledge shared through stories is emergent from and contingent on the quality of relationships, which are at the heart of our collective work. The impacts of this work are reflected in the stories that participants share. We close with these words from Althea Walker:

> *As an Indigenous woman with ancestry from southern and northern tribes, networks like the IFKN are vital to keeping our old ways alive and ensuring that our knowledge lives on through our children. Being a part of the IFKN has allowed me to continue to learn more about who I am, where I come from, and where I'm going.* 

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Between drought and disparity: American Indian farmers, resource bureaucracy, and climate vulnerability in the Southern Plains

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Abstract
Based on research conducted with American Indian farmers and ranchers in southwestern Oklahoma, this paper interrogates how agricultural resource bureaucracies differentially constrain or enable resilience to climate variability. We demonstrate that while extreme weather events have been a persistent impediment to agriculture in the region, for American Indian farmers and ranchers, such efforts have been equally impeded by a history of negative interaction with opaque and frequently indifferent systems of overlapping, yet disjunctive, bureaucracy. Thus we are concerned with precisely how structural vulnerability and climate vulnerability are reproduced in tandem and how such structural constraints have circumscribed nascent food sovereignty efforts. Drawing on our research into how farmers in southwest Oklahoma understand the interaction between the impacts—potential and/or experienced—of climate change and different relationships to agriculture and nature, we demonstrate how demoralization and social defeat emerge from the failures of local resource bureaucracies. Those agencies have, ironically, contributed to the vulnerability of the very population they have been established to serve. What we will show is that, caught between the opacity and bureaucratic posturing of two federal

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resource agencies, many American Indian landowners simply give up.

Keywords
Resource Bureaucracy, Agricultural Governance, Climate Variability, Vulnerability, American Indian Land

Introduction

In 2010, with the assistance of a regional nonprofit organization dedicated to helping American Indians secure the land and capital necessary to make a start at farming and/or ranching, a middle-aged woman and member of the Apache Tribe of Oklahoma, whom we will call Dana, decided to give ranching a try. She leased land from another Native landowner through the local office of the Bureau of Indian Affairs (BIA) and started a small cow-calf operation with a few purchased heifers. Things started off reasonably well, but then the first year of a severe multiyear drought struck. After several years of struggling to keep grass alive and cattle watered, Dana was finally forced to sell off her herd and relinquish her lease back to the BIA, which would offer it to the highest bidder at the next agency bid sale. Another participant, a longtime natural resource and agricultural consultant for tribes in western Oklahoma, said that this Plains Apache cattlewoman's fate was not uncommon among American Indian producers through the state's 2010-2014 drought cycle. As Dana put it, "There was a lot of them that had to . . . go out of business and sell the cows and calves they had, because they didn't have the grass, or they didn't have the hay. They were out of feed, so they just had to get out."

Through this same drought period, many non-Native ranchers in the area went through considerable herd reductions as well, though they were generally able to maintain their livelihood as ranchers. Their capacity was due to a number of factors. First, many non-Native ranchers command a larger land base (though, ironically, a good deal of it is leased from American Indian landowners) that allows more extensive management practices. Second, these operations tend to have greater levels of capitalization and/or ready access to capital, which, on the one hand, insulates these ranchers from temporary losses, and/or, on the other, allows them to supplement their livestock with purchased hay or imported water. Third, non-Native producers tend to have greater access to the risk management and assistance apparatus historically administered through local United States Department of Agriculture (USDA) service centers, which house the offices of the Farm Service Agency (FSA), the Natural Resources Conservation Service (NRCS), and the local Soil and Water Conservation District (SWCD). This constellation of agencies is collectively characterized in this study as *resource* bureaucracies due to their mandate to oversee the federal, state, and local management of agricultural and natural resources, including water, soils, crop and livestock health, and other associated resources. The services these agencies administer, which range from conservation incentive and disaster relief programs to more basic information services concerning technical knowledge, crop insurance programs, application deadlines, and so forth, are indeed critical buffering mechanisms for farmers and ranchers in a region beset by extreme climate and weather events. By "buffering," we refer specifically to the "dynamic interaction of technology adjustment and social restructuring that links public policy, social institutions, and private decision making," as articulated by Vasquez-Leon, West, and Finnan (2003, p. 161). "This perception of 'being buffered' is linked to social class with the greater access to social capital, political power, entitlements, and other resources, where some of the individual risks associated with climate variability are shifted to a higher order of institutional support" (Vasquez-Leon et al., 2003, p. 161).

When we asked Dana about her ability to utilize these same buffering mechanisms, in the case of crop insurance, she responded, "The first year, we didn't know anything about it! There it went! The second year we did ask about it, but the deadline passed us . . . Even though we went to them [the USDA service center], they weren't well informed on what dates they cut off and stuff. I guess you are supposed to know all that." Although her nonprofit partner would assist her in securing some relief through the FSA's livestock indemnity program, due to time lags between official drought declarations and payment allocations,

it did not save her operation. In the framework of vulnerability offered by Vasquez-Leon, West, and Finnan, this condition, in contrast to buffering, can be thought of as coping, defined as "adjustments made by individuals and households with limited technological inputs and *fragile public support* [emphasis added]" (Vasquez-Leon et al., p. 161). Unlike buffering, "coping does not lead to an increased sense of security or the perception that a community is better prepared to deal with future climatic events" (Vasquez-Leon et al., p. 161). These experiences are further indicative of both the long history and the contemporary legacy of discriminatory treatment from local-level USDA service centers, a central focus of this paper.

Adding to the complexity of matters in southwestern Oklahoma is the additional bureaucratic apparatus attending the management of American Indian lands held in trust by the U.S. Department of Interior and administered by the local Agency of the Bureau of Indian Affairs (BIA). Indeed, as pernicious as the effects of drought have been on aspiring American Indian farmers and ranchers, this paper will demonstrate that just as prohibitive have been the effects of these often opaque and frequently indifferent systems of overlapping, yet disjunctive bureaucracies. In examining the attendant intersections, this paper is concerned with precisely the ways in which structural vulnerability and climate vulnerability are reproduced in tandem, even as attempts at both the federal and grassroots levels have attempted to ameliorate these conditions. In such a context, efforts towards food sovereignty utilizing American Indian-owned land are severely limited. Drawing on our research on how farmers in southwest Oklahoma understand the interaction between the impacts—potential and/or experienced—of climate change and different relationships to agricultural and natural resource agencies we demonstrate how demoralization and social defeat emerge from the failures of these local resource bureaucracies. These agencies have, ironically, contributed to the vulnerability of the very populations that they have been established to serve. What we will show is that, caught between the opacity and bureaucratic posturing of two federal resource agencies (BIA and USDA), many American Indian landowners simply give up.

We will begin with a brief examination of the history of American Indian farming efforts in southwestern Oklahoma. This background will demonstrate that, though the proximate causes of American Indian farming challenges have often been climatological (i. e., drought), this trend has been compounded and intensified by a persistent lack of access to institutional resources and assistance. Then we will examine the contemporary history of discrimination endemic to the USDA, efforts by the agency to mitigate this reality, and the continuing problems that plague those efforts. We will then proceed to map ethnographic and archival evidence gathered in 2015–2016 from Caddo County in southwestern Oklahoma in order to illustrate the ways in which USDA policy initiatives for "socially disadvantaged farmers and ranchers" have been doomed to failure. Finally, we will look at the ways in which the combined legacies of discrimination and bureaucratic disjunction between the USDA and the BIA lead to an even greater level of social vulnerability among American Indian landowners. First, however, we will briefly explain the methodologies, data, and limitations that inform this study.

Methodology and Study Limitations

Results presented in this paper are based on ethnographic fieldwork conducted by the authors over 10 months (July 2015–May 2016) and draw on hundreds of hours of participant observation with farmers, ranchers, and other actors in local communities in the upper Washita River watershed in Oklahoma, as well as 59 semi-structured recorded interviews with 65 participants, participant observation and extensive field notation, and thousands of pages of archival documents. Regarding recruitment of interviewees, the study began with the recruitment of key informants, such as agricultural extension agents, members of agricultural co-ops, and participants in local Native American farming groups, who we already knew would be able to help us make contact with and select appropriate additional research participants, who, in turn, recommended other participants. Thus, interviewees were recruited via purposive snowball sampling. Supporting archival resources include the micro-

film collections of Caddo County newspapers archived at the Anadarko Community Library, including *The Anadarko Democrat*, *The Anadarko Tribune*, *The Anadarko Daily News*, *The Fort Cobb News*, and *The Apache Review*. The transcribed interviews and field observations of the Doris Duke Collection, of the University of Oklahoma's Western History Collections, proved an invaluable source as well, providing temporal depth that complemented our own interviews and field observations.

While recorded interviews ranged from 60 to 180 minutes, as one of the authors was a full-time resident of the study area, it was not unusual to spend additional hours, days, or weeks with participants in a variety of settings. Extensive ethnographic field notes were recorded from observational contexts including farm, field, and agricultural production facility tours, attendance at meetings of local nonprofit and producer organizations, visits to the local USDA service center and county extension office, and regular attendance at tribal cultural events and gatherings. The authors have also worked with other agricultural research colleagues and local extension agents to regularly fact check and confirm that our interpretations of the data are reflective of actual conditions. Finally, USDA patterns of differential service delivery have been well documented in both internally produced reports and independent scholarly monographs. These primary and secondary documents add to the veracity of our observations here.

We would like to point out several limitations to this study, however. First, this is a qualitative, ethnographic study focused on the southwest portions of the state of Oklahoma. As with any qualitative study, this limits the conclusions that we can draw about how the situation of Oklahoman American Indians—who had a peculiar history regarding tribal land claims and sovereignty—resembles those of other U. S. tribes. Second, our discussion of racism is limited to what our data can empirically support. While individual research subjects reported individual acts of racism and discrimination, we primarily described structural racism due to limitations in the data available (i.e., the lack of reporting, experiences of undocumented racism that kept some American Indians from ever pursuing agriculture or receiving equal treatment by resource bureaucracies). Third, the study (i.e., the extended, *in situ* fieldwork) was carried out during the period 2015 to 2016, with occasional follow-up with research subjects occurring between 2016 and 2019. We were, therefore, not in a position to fully assess what, if any impacts, might have followed subsequent iterations of the farm bill. However, in follow-up meetings with our research subjects in 2019, they did not report a change in their perception regarding the challenges they face in farming and ranching in the region. Finally, one of the critical "actors" in this paper is the BIA. We believe that the role of the BIA in, at times, compounding the challenges American Indians face in entering and succeeding in agriculture is central. However, our study primarily focused on the experiences and perceptions of American Indian "end users" of BIA services and policies. The particularities of BIA policies and policy-making go beyond what can be included in this paper, but are a critical subject for future analysis.

Background and Context: Vulnerabilities, Variability, and Extremes

Caddo County's modern commercial agricultural economy effectively launched in 1901, when the former reservation territories of the Kiowa, Comanche, Apache (KCA) and Wichita, Caddo, Delaware (WCD) tribes were opened to white settlers. In the case of the KCA, the allotment period marked the closure of a reservation period precipitated by the Medicine Lodge Treaty of 1867 and the Red River War of 1874–1875. The latter events, ending with the Battle of Palo Duro Canyon, resulted in the forced march of the KCA tribes overland to Fort Sill in southwestern Oklahoma over the winter of 1874–1875, and their subsequent settlement on shared reservation lands south of the Washita River, part of which includes modern Caddo County. Although under different circumstances, the Wichitas found themselves, along with the Caddo and Delaware tribes, relocated to a reservation north of the Washita River in 1869, also encompassing part of modern Caddo County (the latter history is well documented in Smith, 1996).

In 1901, the combined reservation lands of the

KCA and WCD tribes were opened to white settlers by lottery drawings. The lottery itself followed on the heels of allotment, a process initiated by the 1887 General Allotment Act, more commonly known as the Dawes Act, through which reformers hoped to accelerate the transformation of nomadic buffalo hunters and semi-sedentary villagers into independent yeoman farmers through the institution of private property. Thus every eligible tribal member was assigned a quarter section of land (160 acres or 65 hectares) on which to realize this chimera of cultural and socio-economic conversion. Leftover lands were designated "surplus," and open to non-Native settlement. This shift in land tenure precipitated an accompanying shift in the local agricultural economy, one that centered initially around cotton but which rapidly incorporated other key commodity crops including grain sorghum, wheat, and, by mid-century, peanuts.

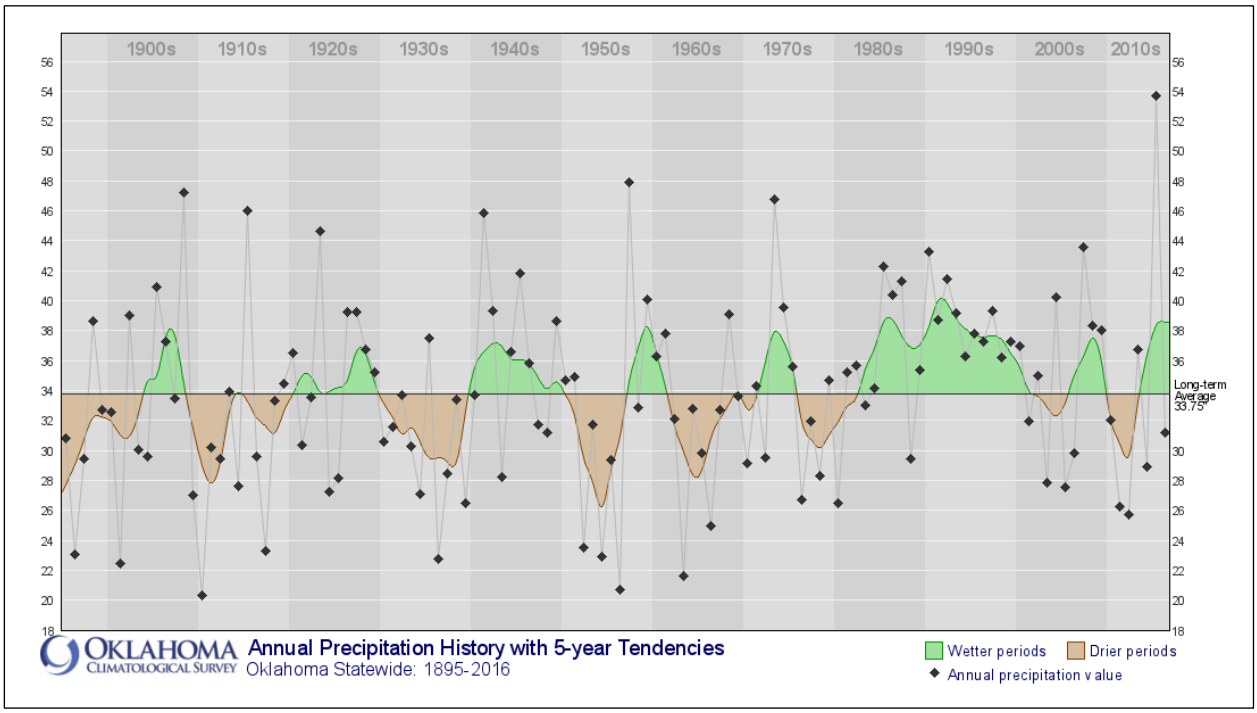
These shifts toward capital-intensive commodity crops demanded expensive new harvesting technologies and practices that worked to exclude minority farmers even as the state's agri-governance apparatus (state land grant college outreach, USDA service offices, local soil and water conservation districts) began to coalesce around them (Lynn-Sherow, 2004). As Stahl (1978) notes, even despite the continued presence of agri-governance agencies, patterns of recurrent drought, economic marginalization, discrimination, and lack of institutional support have plagued American Indian farming efforts in the KCA/WCD jurisdictional areas since their inception in the reservation period. Indian agents recorded drought conditions in 15 of the reservation's 32 years of existence (Stahl, 1978, p. 178). As Stahl (1978) asserts, "Following the trauma of allotment, the major obstacles to American Indian farmers were drought, lack of farm instruction, inadequate farm tools, and a general shortage of capital" (p. 214)—a statement that has equal resonance for current American Indian farming efforts. Indeed, the erratic climatic conditions that beset would-be American Indian farmers in this early period is consistent with the general perception of Oklahoma as having some of the most significant weather extremes and variability in the U.S. Since historical records of precipitation first were kept in the state, extreme year-to-year fluctuation between pluvial and drought conditions have been experienced, often with extended periods of drought, most notably in the 1930s and 1950s (Figure 1).

What is critical to realize in the story that we tell below, however, is that for a number of historical, structural, and experiential causes, many of the most important buffering mechanisms that are available to contemporary farmers in the Great Plains are either unavailable or structurally difficult to access for many Native American farmers. As we will show, Native American farmers remain relatively undercapitalized, lack the same capacity to navigate bureaucracies often run by non-Natives, and are not able to "access" their own land (Ribot & Peluso, 2009; VanWinkle & Friedman, 2018) due to the nature of BIA land trust rules that make it almost impossible for them to act on an even playing field with other, non-Native farmers. The lack of capacity to access these and other buffering mechanisms put them at particular risk—making them more vulnerable to the climatological variability and extremes that are predicted to become the "new normal" in Oklahoma under climate change.

The contemporary experience of American Indian farmers is in many ways analogous to that of African American farmers in the U.S. South. Green, Green, and Kleiner (2011) and Jones (1994) note that African American farmers face problems of scale, mechanization, tenure insecurity, property disputes, market consolidation, limited access to timely and appropriate credit, and "limited knowledge of, participation in, and access to government agriculture programs" (p. 56). On this last point, the authors assert that "most of the prominent government agricultural programs were designed to provide the greatest benefits to those farmers with the highest level of commercial production rather than those in the greatest need of assistance" (2011, p. 56). Such conditions have led to a series of interventions (see below) by the USDA intended to ameliorate this situation, in the South and elsewhere.

With these considerations in mind, the intersecting vulnerabilities that we will describe in this paper will be (1) historic, represented in the problematic and dysfunctional system of land tenure/

Figure 1. Oklahoma's Annual Precipitation History with 5-Year Tendencies, Statewide, for 1895 to 2016



Source: Oklahoma Climatological Survey, n.d.

land access among Native American landowners; (2) climatological, represented in the special challenges, from a coupled human and natural systems standpoint, posed by the particularly extreme and variable nature of weather and climate patterns in Oklahoma; and (3) political-bureaucratic, represented in the disjuncture between the system of agri-bureaucracies in place to protect and support farmers and the inefficiencies and contradictions that functionally exclude Native American farmers in Caddo County from benefiting from the buffering efforts of those bureaucracies.

Historical and Structural Vulnerabilities: Dysfunctional Bureaucratic Legacies and Native American Farmers

The Commission on Civil Rights 1965 investigation of the USDA revealed the nature and extent of the department's history of discrimination in both program delivery and employment practices (U.S. CCR, 1965). Subsequent reports found that practices in the former category were a major contributor to the decline in minority farming and land ownership. As such patterns were initially thought to be most pervasive and severe in the South, such revelations earned the department the epithet, "The Last Plantation" (Mittal, 2000; USDA-CRAT, 1997). Characterized by a professional and agency culture of "passive nullification" (Daniel 2013), this history of minority exclusion dominated both the USDA and the state extension service through most of the 20th century. It was not until 1990 that the first provisions to rectify the problems of discriminatory practices at the USDA were codified in policy, in Section 2501 of the 1990 farm bill, otherwise known as the Outreach and Assistance to Socially Disadvantaged Farmers and Ranchers (OASDFR) program. As explained in a 2016 Congressional report on local food systems, the "2501 program," as it is commonly known, "requires the USDA to provide outreach and technical assistance to socially disadvantaged producers, defined as members of a group that has been subjected to racial or ethnic prejudice" (Johnson & Cowan, 2016, p. 13).

Another series of events important in the evolution of the USDA civil rights history occurred in 1997, when Timothy Pigford, an African Ameri-

can farmer from eastern North Carolina, filed a landmark class-action lawsuit on behalf of 400 fellow black farmers against the USDA. Settled two years later, *Pigford v. Glickman* became a template for subsequent challenges to the long history of USDA discrimination against minority farmers, including the parallel American Indian suit, *Keepseagle v. Vilsack*. Also in 1997, President Clinton commissioned a Civil Rights Action Team (CRAT) to investigate prior complaints and conduct listening sessions around the country, public forums where USDA "customers" could express complaints and grievances. The CRAT report confirmed that discrimination was rampant on both the personal and institutional levels: "Despite the fact that discrimination in program delivery and employment has been documented and discussed, it continues to exist to a large extent, unabated" (USDA-CRAT, 1997, p. 2). The department's status as "a huge decentralized bureaucracy," the report continues, is central to this condition: "Many of its agencies deliver programs through a large field office network in conjunction with local farmer boards which help direct how the programs are administered locally" (1997, p. 2).

Due to the nature of discriminatory practices within this decentralized bureaucratic structure, hard statistical data on specific instances of such behavior have been difficult to come by. A 2008 Government Accountability Office report asserts that while the USDA recognizes decades of discriminatory behavior in service delivery, statistical accounting of efforts to address this issue have been unreliable, "because USDA's data on racial identity and gender are, for the most part, based on visual observation of program applicants" (U.S. GAO, 2008, p. 5). Similarly, a 2011 third party USDA Civil Rights Assessment determined that while the USDA's internal investigations led to no findings of discrimination in over 97% of filed claims, this result is itself indicative of ineffectiveness arising from a combination of unreliable data, delays in processing, and failure to investigate complaints. Consistent with the structural discrimination framework of this paper, the 2011 Assessment found that delays in processing leading to backlogs and lengthy investigations contribute to faulty outcomes: "Delays sabotage the very purpose of an internal complaint system . . . Delays in and of themselves undermine confidence in the process, enable complainants to assume the worst, and damage the integrity of fact finding" (Jackson Lewis LLP, Corporate Diversity Counseling Group, 2011, p. xxv). Indeed, this lack of empirical accountability remains a substantial barrier to the enactment of change in the agency's civil rights efforts.

One useful framework for analyzing the structure of USDA program delivery is through the lens of "capture theory," which holds that "an agency's clientele may come to control the agency thereby deflecting it from its mandated mission" (Fortmann, 1990, p. 362). Decentralized agencies with locally elected directorate boards are particularly susceptible to capture by a homogeneous clientele, such as a Bureau of Land Management (BLM) case discussed by Fortmann. The BLM's boards were initially composed of ranchers nominated by other ranchers, whose group interests came to define the administrative and service delivery apparatus of local BLM offices. Such situations create scenarios with "clear influence of the clientele specified by the agency's mission on agency action and some degree of coincidence of the viewpoints of the agency staff and the clientele" (Fortmann. 1990. p. 363). Indeed, this tendency was noted extensively in the USDA-CRAT report of 1997, particularly at the level of the decentralized local service office. Farmers in listening sessions "described a county committee system that shuts out minorities and operates for the favored few, where county officials . . . have the power to 'send you up the road to fortune, or down the road to foreclosure'" (USDA-CRAT, 1997, p. 7). Furthermore, as the report continues, "employees [in this system] tend to be influenced by the values of their local communities and county committees rather than by national policies promulgated at the national level" (p. 18).

This system is further defined by its historic interdigitation with the agri-governance apparatus that solidified after World War II to serve the interests of a simultaneously emergent agribusiness sector. Defined by Pete Daniel as an "amorphous conglomeration of federal, state, county, and university components," this agri-governance struc-

ture was "Captured by visions of large efficient farms, mindful that powerful farm organizations supported these goals, and aware of congressional pressure to aid wealthy farmers . . ." (Daniel, 2013, pp. 12–13). At the local level, Daniel continues, the effect was a system in which "extension agents and program supervisors worked with successful farmers who could best take advantage of the latest scientific advancements" (p. 13). As Bonnie Lynn-Sherow (2014) contends, in the case of both black and American Indian farmers in Oklahoma, the state's emergent agricultural extension apparatus served to consolidate white farmer dominance and further marginalize minority producers. As in much of the American South, agricultural research and extension in Oklahoma was racially segregated (Hargrove 2002, p. 32), with the state's original land grant institution, Oklahoma A&M (now Oklahoma State University) serving the white farming population and Langston University, founded in 1897 as Oklahoma Colored Agricultural and Normal University, serving the black farming population (and later, other minority farmers). This situation had a direct correlate for American Indian farmers in Caddo County, where "white extension agents and farmers believed that the needs of Native farmers were being supplied by the Office of Indian Affairs" (Lynn-Sherow, 2014, p. 137), even as the BIA moved toward eliminating these programs in the 1940s.

This differentiated agri-governance system, however, is decidedly not an instance of separate but equal, with Langston following a common historical pattern among 1890 land grant colleges (those established under the second Morrill Act of 1890), wherein, as Lynn-Sherow (2014) notes, "black schools [received] far below their proportion of funding based on population" (p. 57). Paralleling this historical inequity, while Oklahoma's allocations for 2501 programs have been awarded overwhelmingly to Langston University (Rooke, 2015), this funneling of overall resources has in effect absolved Oklahoma State University's extension service—present in every one of the state's 77 counties—of any focused and mandated engagement with those producers targeted as "socially disadvantaged farmers and ranchers," thus perpetuating the system's entrenched segregation.

While the 2501 program has inherent problems, such as the competitive grant funding process that undermines solidarities essential to transformation of the larger system (Rooke, 2015), it nonetheless remains a central focus of some nonprofit organizations attempting to increase agricultural enterprises among American Indian landowners in southwestern Oklahoma, as in the story of Dana. Such organizations in southwestern Oklahoma have had a long history, and current efforts are often grounded in a renewed sense of the possibility for self-determination that farming and ranching present. The director of one such nonprofit said in an interview, "We don't have no manufacturing, no industries, nothing here to employ us. So people here are looking at ways to make use of their land, and one way is farming." Speaking about the influence of this group on local American Indian farming efforts, another research participant and member of the same group said, "[This] is the first group that has ever approached Natives, local Natives, and said, 'Hey, you can farm! You can take these classes, you can learn to be farmers, and you can farm your own lands! You can do this instead of other people doing it." Major obstacles to substantive achievement remain, however. While the struggle to deal with extreme climatic events is one challenge, even more central to the constrained adaptive capacity of American Indian producers with limited resources is a persistent lack of institutional access. Through significant examples drawn from ethnographic observation, integrated with interview excerpts from the current research, the next section will illustrate the dynamics that perpetuate differential access to knowledge and assistance that might otherwise yield greater resilience.

Contemporary Ethnography of Vulnerability

On an evening in the fall of 2015, one of the authors attended a meeting of a local 501(c)(3) organization devoted to assisting American Indian landowners in southwest Oklahoma, many of whom were seeking to farm their own land for the first time. The nonprofit director and meeting organizer, an American Indian landowner and former tribal liaison through Langston University's 2501 initiative, launched activities by welcoming

everyone and asking one of the gentlemen present, an older American Indian man, to lead us off with a prayer. Then our host emphasized the group's primary interests in livestock production activities and associated USDA assistance programs, especially the 2501 programs. Agendas were then distributed, and the director and meeting host introduced the scheduled guest speakers.

First was a loan officer from the FSA division of the local USDA Field Office. His talk focused on FSA low-interest micro and youth loan programs. The former loan type is for amounts of US$50,000 or less, he explained, and can be used for real estate, farm animals, equipment, or operating expenses. He emphasized that this loan program could finance, for example, start-up expenses for cow-calf operations, the primary interest of most of those present. This could include money for the purchase of heifers and costs associated with husbandry over the course of a calving season. Audience questions were quickly forthcoming. One attendee, whom we will call Jeff, a middle-aged man of mixed Comanche and Italian descent, asked about collateral, especially in instances where an individual has no significant assets to begin with. The speaker explained that in the instance of equipment purchases, the equipment itself could serve as collateral. But, he continued, approval is contingent upon a cash-flow analysis and the examination of three years of financial records. Though Jeff said nothing further at the meeting on this matter, in a later interview he offered comments that suggest the difficulties in operationalizing this seemingly simple process. Speaking of the recently rekindled desire among Native Americans to reap some direct benefits from their own land, land that has been in the productive control of non-Native lessees for more than a century, he says of the USDA, "They won't give us loans. We're just beginning farming now, and they won't give us loans because we don't have records. We don't have these things that other people do already, because they've been doing it and we haven't."

Another audience member inquired about the implications of a bulletin issued by the USDA communications office announcing the allocation of US$10 million to support socially disadvantaged and veteran farmers and ranchers under the reauthorization of 2501 programs in the 2014 farm bill. Exhibiting limited knowledge of this announcement and its potential applicability in a county in which American Indians constitute a quarter of the population, the speaker responded that the approval process for FSA loans to individual producers is the same, regardless of race. However, the FSA Fact Sheet, "Loans for Socially Disadvantaged Farmers and Ranchers" clearly states: "Each fiscal year, the agency targets a portion of its direct and guaranteed farm ownership (FO) and operating loan (OL) funds to SDA [socially disadvantaged] farmers" (USDA FSA, 2011, p. 1). This can be considered to be an example of the disjunction of national and local level initiatives that the USDA-CRAT report identified almost 20 years ago.

A second meeting hosted by the group included speakers from the housing division of a neighboring county's USDA rural development office, another FSA representative, and a newly hired soil conservationist from the local NRCS office. All presenters from the USDA programs delivered informal overviews of specific loan and payment incentive programs. Beginning with the housing presenter, audience members expressed what through the evening became a nearly unanimous chorus of frustration at the realities faced by many American Indian landowners. It began with a simple question concerning required BIA approval for 504 loan and repair grants, as well as other programs. The FSA representative, upon concluding a thorough overview of the kinds of programs administered through the FSA and the assistance available through Emergency Conservation funds (used to repair damages caused by flooding and other severe disasters), was again confronted with expressions of frustration. Trust-land allottees, many in the audience agreed, are mostly unaware of these kinds of programs and are unsure where, how, or by whom they might be better informed. Many once again expressed frustration at the BIA's apparent negligence and/or indifference.

The NRCS programs representative was met with similar expressions of frustration, particularly directed toward the office's Environmental Quality Incentives Program (EQIP) allocations. Especially

opaque to those gathered in the room was the process for determining priorities for disbursement of EQIP monies. The representative assured the audience that priorities were established via local input through public meetings. Audience members asked why they had never been aware of these meetings, and whose responsibility it is to inform them. The NRCS representative stated simply that these meetings are announced in local newspapers. Furthermore, NRCS's StrikeForce Initiative, a program recently extended to the state of Oklahoma, features targeted funds delivered through the EQIP program. The program's stated goal is "to increase USDA outreach to underserved populations and rural communities, while also improving access to and participation in USDA programs, as well as working to provide additional economic benefits to these areas" (USDA NRCS, Oklahoma, 2015, para. 2). Although Caddo County is identified as one of 32 in the state targeted for the StrikeForce initiative, NRCS staff at the Caddo County service center made no mention of this special program before an audience of American Indian farmers, although the Oklahoma StrikeForce initiative website features a short video, "StrikeForce in Indian Country," which might have served as a suitable orientation for that evening's presentation.

In a final and particularly poignant example from this meeting, an audience member we will call William shared his story of being thwarted in his efforts to take advantage of EQIP program funds. Because the funds are disbursed on a first-come-first-served basis, he stated, by the time the BIA got around to reviewing his request, the EQIP funds were gone. In the meantime, he exclaimed with considerable indignation, all his non-Indian neighbors had new fences paid for through EQIP. As William later explained in an interview, multiple agencies coordinated relief efforts following a recent flood event. "This flood down here last year, last summer, knocked out miles and miles of fencing," at which point the coordinating agencies, "come in here [and] bless these guys and then they all got new fencing. Pretty. It's got leaves and weed hanging on it, but it's stretched tight. You go down the other way, where I'm at, Mr. Indian man, it's nasty looking [in disrepair]." Another research participant, whom we will call Matthew, a long-time agricultural consultant to the tribal peoples of southwestern Oklahoma and himself a local rancher, expressed a similar frustration: "The Emergency programs for floods—the Indian landowner could not qualify for those programs. . . Well, if they sent it down and they're funding [repairs from] flood damage and emergency-type situations, why aren't we qualified? We've been flooded just like everybody else." Later in the same interview, Matthew added, "What I've told a lot of landowners who asked me about those types of assistances, I said . . . 'All I can tell is apply for it, ask for it, they'll just tell you no.' I said, 'I don't know why, I don't know the reason.' "

Legacies of Bureaucratic Inertia

The above examples are reflective of persistent larger patterns that reach back to the findings of the USDA-CRAT investigations of 1997. As the authors of the report wrote:

> One example of a "broken" system is that field level employees, those closest to farmers, often work under an incentive system that is averse to serving minority and other small producers. Minority and small farmers said that their loans are processed too late, if at all, and that often "the money is gone" by the time they are approved. Field employees' performance ratings are often based on measurement systems that favor large, wealthy landowners . . . USDA's policy statements support the idea of helping low-income and socially disadvantaged farmers. However, its management practices include performance measurement systems that actually do the opposite. (p. 8)

Many American Indian participants spoke of very similar personal experiences and their lasting influence. One participant, whom we will call Tom, spoke of his experience after returning from Vietnam:

> After I did my tour of duty I went to this agriculture deal over here, where the farmers go [the USDA service center], and see if I could get a loan to get a tractor, plow, a brush hog and whatnot . . . They told me they couldn't do

> it. I asked why, and they said . . . How'd he put it?—said 'You're Native American' . . . Wouldn't even give me an application.

Jeff (mentioned above) spoke in strikingly similar terms:

> Up until now the FSA department here in Anadarko, up until now, they don't service Native Americans . . . Right now they're starting to because of all the lawsuits we've had against them . . . It was [an] old boys society. They wouldn't wait on you; you go in to ask for an application, and they'd tell you, 'No, we don't have any,' or 'Go to the BIA, they're the only ones that can help you.' They'd just flat turn you down.

Later in the same interview, Tom spoke of the lasting impression such experiences left on him: "From my understanding, we weren't supposed to be denied [the opportunity to apply for this program], I found out afterwards. Regardless if you're Native American, you're black, you're Hispanic, you have that right [to apply], to get that loan to get started. Whatever you want to do—plant crops, bail hay, raise cattle on it—you have that right. But I said, well, I ain't messing with them over there [at the USDA office] anymore." Indeed, the experience of discrimination and the sense of "social defeat" it engenders create a powerful deterrent to future participation in such programs. The director of the local nonprofit organization, whom we will call John, stated: "[American Indians] had experienced so much racism and prejudice in these programs—they would not step in that office . . . I had to be the person to walk them in there or take their paperwork in there. That's why I . . . [started] doing their farm loans and all . . . That's the barriers they were faced with. Once you're told no, as a Native American, you know, you'll withdraw . . . It's changing, but it's not changing overnight." Others are more cynical about the future. Asking Jeff about USDA active initiatives for socially disadvantaged farmers, he replied: "I think right now it's mostly lip service . . . because of the lawsuits the FSA and the USDA has been under . . . They put a lot of words out there saying, 'Oh, we're helping socially disadvantaged [farmers], we have all these programs,' but yet do they implement them? That's the question. We haven't seen it yet here in this area."

In another exchange, an older landowner of Kiowa descent, whom we will call Nick, put it this way:

> I used to sell cars. Some guys are out there running the lot, and they chase every car that comes in. I used to have an old sales manager, and he said—remember this now—"You can't confuse activity with production." Okay? Now, these [USDA] employees, they can be as active as you want, but somewhere in here you have to say, where is the measurement of production? No one's asking that question . . . if you talk to them, they'll say, "Oh yeah, we got this paper out, and we give it to 'em, and gosh, look at how many applications we've got here" . . . [But] where's the [proof of] production?

The situation is further exacerbated by a second layer of bureaucratic oversight, as most American Indian land is held in trust by the United States and thus falls under the management purview of the local BIA office. Another interviewee, whom we will call Don, offered this incisive assessment of the BIA's role as a land management entity:

> Our trust lands are all managed by the BIA. BIA over the last 30, 35 years has begun to pull their technical and field people for conservation . . . and put that money into the office, and administrative support. You don't have the [personnel] . . . there to make sure the land is used properly, contracts are followed, maintenance is done. So your trust lands are really overused and not taken care of. Not all of them, but a majority of the lessees will use it, and if they can't make any money, they let it go, and they go get another lease. Well, that landowner is stuck with something they can't lease and if they do its abused because they have to abuse it to make money. So they're in a Catch-22. Then they turn around to the

> Bureau, and the Bureau don't have the technical assistance for them to find out, 'How do I take care of this?' because that's the first question these beginning farmers and ranchers have been asking.

Because of this situation, would-be beginning tribal farmers and ranchers perceive a series of obstacles from the start. These include not only concerns about failing conservation infrastructure in the form of broken terraces and failing flood control mechanisms associated with their belief that they will need to cope with the cost of mitigating decades of neglect by abusive lessees, but also their very real experiences with lack of access to the institutional support mechanisms that might assist in rebuilding these features.

Speaking of the willingness of many American Indian would-be farmers and ranchers to shoulder this burden anyway, Don continued:

> They're taking care of their families, but they're also trying to take care of rebuilding land. That's where we need a lot of help, but there's no help out there. Of course, NRCS and the Department of Agriculture are there to help us, but we have to qualify for their programs, or we can't get their technical assistance. And BIA has no technical assistance . . . I think there is an MOU [Memorandum of Understanding] between the Department of Interior, BIA, and [the Department of] Agriculture to be that technical assistance for the Indian landowner. But . . . if that Indian landowner can't qualify or get a contract to do conservation work . . . then there's no technical assistance there.

Continuing with this inquiry, I asked how much this difficulty was linked to non-overlapping bureaucratic calendars and program deadlines. He confirmed that this is a real problem and offered the following example:

> Let's say you've got a program you can qualify for to do conservation work, but you've got to be in control of the land for, let's say, seven or eight years. Well, BIA has been doing three-year contracts and five-year contracts. Those long terms contracts that they need, they can't get, so they can't use that program, because they can't assure the Department of Agriculture that they're going to be in charge of that land.

In his final assessment, John offered,

> Our biggest challenges, our biggest barriers to farming and ranching our own lands, has [*sic*] been the red tape, the politics that we have to go through in order to farm our own lands. The policies in place, they're outdated. It took me close to five years to farm my own land—to farm my own land!—because the Bureau of Indian Affairs didn't have no policies in place for a Native American farmer.

Implications and Recommendations

In order to practically address the issues discussed above, we suggest the following considerations for action:

(1) Address the bureaucratic rules in the BIA land trust system that make it difficult for Native American farmers to benefit from the same federal buffering system on which non-Native farmers are able to draw. It is unlikely that anything less than concerted, active, grassroots political pressure will result in these changes. However, there is a historical tension in place that complicates these suggestions. Quite simply, there is a perceived reason why these rules regarding trust and the intervention of the BIA exist—historically, too many Native American landowners, as their stake in their trust land was reduced due to fractionation through inheritance among multiple heirs, found it better to sell their land for quick income rather than to try to develop a small-scale farming venture that would compete poorly against larger, more heavily capitalized farms. At the same time, these policies are profoundly paternalistic and reflect a deeply problematic colonial history, an ongoing pattern of disregarding the agency of Native Americans.

(2) Improve agricultural outreach in Oklahoma to mandate or encourage improved and appropriately designed agricultural extension services to Native American farmers, so that they become aware of the steps necessary to take advantage of grants and other programs available to farmers. We believe that there are aspects of the existing extension system and many other established federal systems to support agricultural development that reproduce a system of discrimination against Native American (and other minority) farmers. So although there are no Native American representatives on the local co-op board or the local NRCS board, we believe that there is potential to ensure that these organizations and institutions provide better information to and representation of the needs of small Native American farming ventures and Native Americans who seek to start farming. This can be achieved by ensuring that population-specific resources are provided by extension agents that will address the needs and concerns of Native American farmers. In addition, local co-ops and the NRCS board can be drawn into explicitly supporting Native American farming ventures by stressing their value as local *business* ventures.

(3) Provide informational resources to Native American farmer groups in the region that will permit them to provide their members with up-to-date programmatic information about federal and state resources and programs that can be mobilized both during normal years (when grants might help a farmer build a resilient infrastructure to prepare for drought) and during periods of disaster (rapid response grants that are often available to mitigate the impacts of specific disasters). This latter recommendation provides a way of ensuring that Native farmers have their own capacity and initiative regarding communicating with their members and tailoring their efforts to the needs of their members, something that statewide agricultural extension services are rarely able to do.

In addition to the above considerations, members of the larger research project from which this article derived have also proposed a Master Small Farm Advisor program to operate within Oklahoma Cooperative Extension Service (OCES) to bridge the gaps in trust and service between agricultural institutions and Native American populations. This program was conceptualized within the project's larger commitment to the development and implementation of decision support tools. The proposed program would use a service delivery concept comparable to one that already exists in OCES, the Master Gardener Volunteer program. The goal of the project is to use peer learning to offer minority and beginning/small-scale farmers the opportunity to increase their access to knowledge and programs that will help them maintain and grow their operations. Such a program, however, has proven difficult to establish, due to time and resource constraints within the OCES as well as poor community response to informational meetings. It is the hope of the researchers, however, that such a program may be implemented at a later date, perhaps with the assistance of a USDA small-producer grant. That future is, for now, in a holding pattern.

Conclusions

We have described many of the structural and political-economic conditions that have coalesced to undermine the possibilities available to American Indians who wish to pursue agriculture in the harsh climatic conditions of southwest Oklahoma. The experiences that our interviewees have faced, either personally or through the sharing of knowledge and experiences with other tribal and community members (O'Nell, 1996, p. 25), have shaped their attitudes vis-à-vis the government bureaucracies that were established, but often failed, to provide them with services, scientific advice, start-up loans, and various forms of social insurance to ensure that they can make it through hard times.

While there is a rich history of social scientists studying bureaucracies and/or people's experiences with bureaucracies, much of this has focused on how people have learned to adapt to or navigate them, or how they have been productively shaped (as Foucauldian citizen-subjects) by these bureau-

cracies. In some cases, subjectivities are shaped through a conscious effort of "self-making" and performance in order to meet the demands of a bureaucracy (Silver, 2010); in other cases, subjects are shaped into citizen-subjects without their conscious knowledge or acceptance (Verdery, 1996); and, in still other cases, the act of evading or violating a bureaucracy can shape subjects and selves (Connolly, 1983). In this way, anthropologists have often documented how people have needed to become what a bureaucracy needs them to be in order to receive the services that that bureaucracy offers.

Our research with American Indians negotiating resource bureaucracies has shown that these agencies have worked to produce two things: first, a system that is structured to continue a history of discrimination against Native American farmers, and, second, a system that produces demoralization—actors who withdraw from participation in those very state-supported bureaucracies that were created to assist all farmers. Instead of shaping new, productive citizen-subjects by demanding that those subjects internalize bureaucratic logic and processes in ways that will change them, we have seen a system that has succeeded in setting up barriers that demoralize Native American farmers, leading them to be more likely to give up and walk away than to become the "productive" subjects the state seeks to shape (Friedman, 2007).

Like the example of ranchers in the Sulphur Springs Valley along the Arizona-Sonora border zone studied by Vasquez-Leon et al. (2003), the Southern Plains drought of 2010–2014 exposed differential vulnerabilities to climatic extremes. The buffering mechanisms built into contemporary disaster relief and assistance programs have facilitated a robust adaptive capacity (though perhaps not a sustainable one) by the conventional agricultural sector in a climatic zone that tends toward extreme climate variability and the ruin that often accompanies it. Resilience in southwestern Oklahoma, if defined as the ability to withstand severe disruptions, is limited to those best positioned to take advantage of the existing system of federal support programs administered through local resource bureaucracies. As this paper demonstrates, however, most American Indian farmers in southwestern Oklahoma lack institutional access, leading to their increasing vulnerability.

This paper has also demonstrated that long-term patterns of discrimination in the delivery of services continue to characterize the experience of American Indian farmers in southwestern Oklahoma with local resource governance institutions. While the recent settlement of the *Keepseagle* class-action lawsuit against the USDA, like the *Pigford* case before it, has brought attention to these issues at the national level, change at the level of local service delivery has been less forthcoming. The reasons for this are numerous. First, local control of decentralized USDA service centers continues to be in the hands of the most capitalized conventional farmers, those most able to leverage government support programs as a buffer against extreme climate events and environmental disasters. This reality results in heightened vulnerability to these same conditions among other farming populations. Second, bureaucratic disjunction and/or inertia consistently work against American Indian farmers. In particular, disjunctions between the BIA and the USDA persistently disqualify and/or otherwise hinder Native farmers from taking advantage of support programs. Likewise, an opaque bureaucratic proceduralism attending both the administration of the BIA's land trust responsibility and the allocation program benefits from the local USDA service center constitute another barrier. The latter illustrates the final point here, and that is simply the persistence of discriminatory behavior in local service delivery, a trend noted consistently in the USDA's own assessment literature (Beatty-Davis, 1997). While the first and second points can be reformed through policy initiative, the latter condition is a matter of culture, and thus one far more difficult to change. In this regard, the words of John, whose struggles have been central to this paper, serve as a suiting conclusion: "In order to see change in the lives of people here . . . people got to change, you know. People got to change. We all live together, we all live here together and everything, and we just got to get by the best way we can. We're living in a ugly, hard world—we're all trying to survive."

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Restorying Northern Arapaho food sovereignty

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Abstract

Communities in Indian Country across the U.S. are reconnecting to traditional and healthier food systems, often working explicitly for food sovereignty. This paper contributes to these reconnection efforts by (re)telling the story of the Northern Arapaho food system and the path we are creating toward health and our reclamation of Northern Arapaho food sovereignty. With support from my co-author, I approached data gathering and analysis in a blend of traditional native and conventional western research ways. I use the phrase "foreign intrusion" to help re-name eras in our history when our food system was altered by colonialism, forms of physical and cultural genocide, and assimilation. This "restorying" of the food system history of the Northern Arapaho people provides an indigenized frame for understanding our food system history, impacts of intrusion, and paths for reclaiming Indigenous food sovereignty. My methods include interviews with tribal members (*N*=16), three talking circles (*N*=14, 11, and 6), autoethnography, seven years of participation and observation in food sovereignty work, and document analysis, in addition to extensive literature reviews.

Keywords

Restorying, Food Sovereignty, Foreign Intrusion, Health Disparities, Indigenous, Native American, Food Dignity, Growing Resilience, Arapaho, Colonization

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Introduction

By reclaiming our food sovereignty, Indigenous nations are also restoring our identities, cultures, his/stories, and traditions. In this research, as a Northern Arapaho tribal member, I aim to contribute to my people's food sovereignty movement by reclaiming our food system story. For all Indigenous nations, recovering our food sovereignty is integral to our self-determination, cultural reclamation, economic development, and public health.

Over the last 200 years, the story of my community has been a brutally violent one. This was, at first, directly at the hands of foreign intruders (as I call them) and then, increasingly, by the long arms of the trauma they have systematically inflicted upon all Indigenous Nations in what is now the U.S. However, like all Indigenous Nations, nearly all of our history, including our food system history, happened before this foreign intrusion. Also, like other Indigenous Nations, we are now reclaiming our food, our health, and our stories. In this paper, I begin to reclaim the story of the Northern Arapaho food system for our tribe's sovereignty and health.

This reclamation provides a stepping stone toward food sovereignty for Northern Arapaho people today and for other Sovereign Nations who share some of this history. It also provides one example for other Nations who find themselves on a similar journey to reclaim their own stories.

Background and Methods

Before foreign intrusion, Indigenous sovereignty included all North American lands and our ceremonial cycles, sacred places, and languages (Holm, Pearson, & Chavis, 2003). Then—as I discuss in this paper about Arapaho history particularly—our land, culture, food sources, and children were all stripped away by the intruders. Even the small swaths of reservation land assigned to us by treaties have been further diminished through broken treaties, the Dawes Act, and simple seizure by White encroachment.

These traumas and disruptions of intrusion have devastated our traditional foodways and our health (Kuhnlein & Receveur, 1996). For example, from 1492 to 1837, smallpox outbreaks decimated many Indigenous communities. Starting in the 1800s, many Native people starved as a result of the loss of food sources along with the loss of access to hunting, gathering, and growing lands (McGoldrick, Giordano, & Garcia-Preto, 2005). Today, the descendants of those who survived suffer among the worst health disparities in the U.S. (Jones, 2006; Porter, Wechsler, Naschold, & Hime, 2019).

However, as the collection of papers in this special issue show, we are reclaiming our health, our foodways, and our sovereignty. One means of this reclamation is decolonizing our stories of this history and the impacts on the life course of each Nation and Indigenous people as a whole (Oland, Hart, & Frink, 2012; Treuer, 2019). For our people to reclaim our history and our future, the right story, in both factual and ethical senses, needs to be told (King, 2005).

This paper aims to tell the story of the Northern Arapaho food system in a good and right way. Stories about Indigenous people's food systems help explain and improve the understanding of the historical implications of colonization that have led to current food and health disparities (Kuhnlein, Erasmus, & Spigelski, 2009). Storytelling becomes a form of pedagogy when a story's plot highlights human experiences and the narrative inquiry process illuminates cultural and historical contexts of that experience (Coulter, Michael, & Poynor, 2007). We use stories to develop, convey, and share knowledge, ethics, and paradigms across generations (Hodge, Pasqua, Marquez, & Geishirt-Cantrell, 2002). The Arapaho people use stories to document their histories from time immemorial, and as such, oral traditions are elements of our society that can only be told by a tribal member (Dorsey & Kroeber, 1997).

In this paper, I collect stories from the literature and Northern Arapaho people, analyze what Ollerenshaw & Cresswell call "key elements of the story" (2002, p. 332), and organize these elements into a coherent chronological narrative that restories the Arapaho people's journey. For example, I illustrate our history with a time circle (Figure 1), mirroring Indigenous science, which views time as cycles (such as seasonal, lunar, and life cycles) rather than as linear "progress." From

a Native perspective, the term progress is a particularly inappropriate word to use, as one of the most recent slivers of time in our history is dominated by foreign intrusion (shown in red in Figure 1).

Setting

My tribe today is known as the Northern Arapaho. We are "Northern" because, by the 1850s, the intruders disrupted the natural migration of our buffalo herds which split us from our brothers and sisters, who joined our Southern Cheyenne cousins on Oklahoma reservations. Together, we are the *Hinono'eiteen*. Today, the Northern Arapaho people share the Wind River Reservation (WRR) with the Eastern Shoshone people.

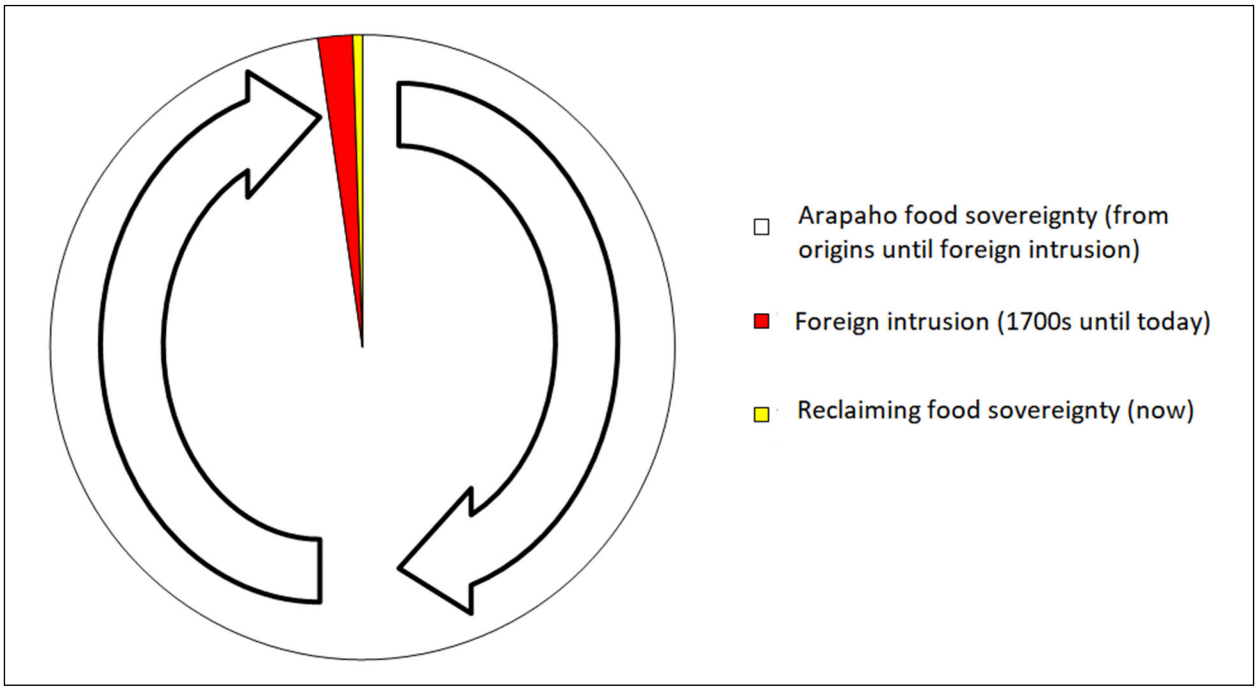
WRR is the seventh-largest reservation in the U.S., with roughly 3,473 square miles (899,500 hectares) within the state of Wyoming. Approximately 27,088 people live within the reservation borders (U.S. Census Bureau, 2018). Nationally, approximately 10,000 people are enrolled Northern Arapaho tribal members, and 5,000 are enrolled as Eastern Shoshone, most of whom live on WRR or in small cities that are nearby (Wind River Native Advocacy Center, Wyoming Association of Churches, & Wyoming Office of Multicultural Health of the Wyoming Department of Health, 2016). Remarkably, on the reservation itself, the majority of people are Whites who lease or own what was originally reservation land (U.S. Census Bureau, 2018). On WRR, most Northern Arapaho and Eastern Shoshone tribal members live on family lands originally allotted by the U.S. government around the turn of the century and that are now designated by tribal governments. The results section shares some of the history that has led to this current setting.

Authorship

Though I am an Indigenous person, I did not first learn a history of the Northern Arapaho from my people, through storytelling. The first version I learned was from conventional White history

Figure 1. Time Circle History of the Northern Arapaho Food System

A visual representation of the cycle of life for many Indigenous groups who believe that all life begins and ends with a rebirth, like the changing of the seasons. This figure depicts the perpetual and cyclical nature of the Arapaho food system. It illustrates how short the period of foreign intrusion is in relation to the overall history of the Arapaho people. It also shows the current sliver of hope that Indigenous food sovereignty movements today provide.



sources during my academic career. For example, in the U.S. children are taught that Squanto and Massasoit helped the Pilgrims survive in the new world in 1620, but history teachers do not teach children that 55 years later the colonists killed thousands of the Indigenous people and sold many into slavery. For my people, I learned about the Dawes Act of 1887, which led to so many non-Native people owning land on my reservation and aided the state of Wyoming in co-opting some of the best agricultural land in WRR, including building their city of Riverton within our collective home (Carlson, 1998; County 10, 2018).

That history makes me feel angry and, in part, drives the work I do today in food sovereignty with my people. Having first encountered this history only in adulthood, at a non-Native academic institution, and mostly told by non-Natives, also makes me feel angry, and that drives me to reclaim and restory this history about my people in this work here. I hope this example encourages other Native people to tell our own histories while also giving future generations a better chance of learning our stories from one another and not only from history as told by outsiders.

Some conventional Western scholars might have concerns that both my anger and my insider status could contaminate my objectivity. Both do affect my perspective, including the research questions I choose to ask, the methods I use to answer them, and my analysis of results. At the same time, one's feelings and position affect this process for every scientist and scholar. As science philosopher Sandra Harding notes, objectivity is not neutrality, and our job in research is to strive for strong objectivity by naming and accounting for, as much as possible, our biases and our stances (Harding, 2000). I strive for that here, including by acknowledging my anger and openly conducting this research with the goal of retelling our story from an insider standpoint. This standpoint, I would argue, is at least as valid as the ones from which non-Natives have been telling stories, about us, from outside.

In addition, as Indigenous science philosopher and methodologist Shawn Wilson notes, research is relational, with the purpose of bridging the distances between the truths of our cosmos and us and between us (S. Wilson, 2008). Using the methods described below, I strive to generate these kinds of strongly objective and relational truths here.

In this paper, when I say "we," I am referring to Northern Arapaho people specifically and, when relevant, Native people generally, including the Eastern Shoshone. We understand ourselves, in many ways, as one people (Anderson, 1994). Also, although I am writing this paper in the singular first person, I have a co-author. She is a White woman who was my chair when I completed much of this work for my master's thesis as part of a project called Food Dignity. She is now principal investigator of a project called Growing Resilience, for which I am a currently a research scientist and from which I draw some of the data I analyze here. She has supported and guided my research, including helping me to share my work in this form.

This restorying research forms a small subset of two much larger action-research projects about food justice and sovereignty. One is the Food Dignity project, which supported and learned from five community-based food justice organizations about how to create sustainable and equitable community food systems (Porter, 2018). My co-author recruited me to become a master's student with that project, from 2012 to 2015, with a focus on food sovereignty in WRR. She then secured NIH funding for a randomized controlled trial on the health impacts of home food gardening with 96 families in WRR. I am currently a research scientist for that project, which is called Growing Resilience. A community advisory board in WRR guides that project and the partner organizations that are implementing it. They strongly encouraged my interest in documenting impacts of the gardens with families well beyond the quantitative health indicators being gathered from participants. The data that I have gathered and analyzed for this research have been part of my work with these two projects.

Data Collection

My methodology is intended to fill gaps in our food system history by collecting the stories of our path away from and, more recently, back to self-sustainability and a sense of identity that promotes

healthy Indigenous communities. My work is intended to share this restorying with all Sovereign Nations, both because of our partly shared history, and because all Nations need to reclaim and retell their stories. Also, both Natives and non-Natives should know this history of how we lost ownership of the food system as an element of our sovereignty, and how we are beginning to regain it.

To gather the diversity of data needed to tell our story, I used five different kinds of data collection, as described below. All data collection was approved by the University of Wyoming institutional review board and the governments of both Nations of WRR. Individual participants gave their signed, informed consent. In addition, Growing Resilience data gathering and this analysis were approved by the project's community advisory board.

1. As part of my Food Dignity master's thesis research, I conducted semistructured interviews (N=11) with Northern Arapaho tribal members in 2013. I invited community leaders who have or held professional positions in WRR in promoting our well-being and our sovereignty. I asked them to describe and discuss the food system in their community, for example, by asking, "can you please tell me about the food system in your community?" and following up with "what does that mean to you?" In addition, in 2018, a colleague and I invited the 10 families who participated in the first wave of Growing Resilience to tell their own stories about gardening and to choose their approach. Five asked to be interviewed, and so I conducted these interviews, asking them about their gardening experience, for example, and what they valued most about it and struggle with most. These were recorded and transcribed.

2. In 2017 and 2018, a colleague and I conducted three traditional talking circles as part of the Growing Resilience project. These are akin to focus groups, and holding a talking stick is used to represent whose turn it is to talk, while the others listen carefully. We invited all the heads of all 33 gardening families who were in the study at that time to participate in a talking circle. We held two talking circles with these gardeners (N=14 and N=11, representing 13 families). We showed a video produced by a gardener in the community (Potter, 2015) and asked them what the project and gardening mean to their family, and then asked how it impacts our communities. We also held a talking circle with the six members of the Growing Resilience Community Advisory Board, who used the session to tell the story of their experiences in the project to date. These were recorded and transcribed.

3. I have been participating in and observing the grassroots health and food sovereignty efforts in WRR since 2012. This has included serving as the market manager in the summer of 2012 for the tribal farmers market founded by Blue Mountain Associates (documented in a report I wrote for the organization that season), making many home garden visits (documented in field notes), and participating in dozens of related events and meetings involving health (documented in meeting notes and occasionally my field notes).

4. As noted above, my life story is embedded in the history of the Arapaho people. I grew up in WRR and am an enrolled member of the Northern Arapaho tribe. Thus, in part, this research is autoethnographic. When these stories are told by Indigenous people and intended to capture their experiences in conflict with dominant forces, their stories become a discursive power; they serve as truths that will not be forgotten (Denzin, 2006). I developed this research program as a response to finding non-Native versions of this history during my university studies and then determining I wanted to become involved in reclaiming Northern Arapaho food sovereignty and our collective story of its loss and our current work to regain it.

5. I have closely reviewed conventional academic literature and some local primary documents (e.g., media reports) and lesser-known scholarly produced locally about Northern Arapaho history.

In my analysis, described below, I triangulated this blend of methods and resulting data to develop, check, and validate the food system story for and of the Arapaho people.

Data Analysis

The focus of my data analysis was identifying the facts, memories, and interpretations of the Northern Arapaho food system history across all five types of data sources in order to weave them into one narrative. That narrative is the restorying of the Northern Arapaho food system, found in the results section.

I analyzed the transcripts of the interviews and talking circles in two ways. One, I employed a version of narrative inquiry, analyzing the stories people told holistically, for understanding of meaning and context. Particularly in Indigenous applications, narrative inquiry places life stories and relationships at the heart of analysis (Barton, 2004). I read and reread each transcript, highlighting particular stories and examining them overall for themes (Petty, Thomson, & Stew, 2012). I looked specifically for historical events that altered the food system for the Arapaho people, which helped shape the era definitions in the results. Two, I systematically coded the transcripts, using open coding and specifically looking for passages that related to the historical and current eras of our food system. Excerpts of what people told me during the Food Dignity project are indicated with (FD), and those marked with (GR) come from stakeholders in Growing Resilience. Quotations from both appear in italics.

I developed and divided the eras of our story further via my document and literature reviews. Finally, my last seven years of participation and observation, and an auto-ethnographic examination of my own life experience as a Northern Arapaho, inform my systematic analysis and interpretation of these data.

In the results section, I restory the history of the Northern Arapaho food system by weaving together the voices of interviewees and talking circle participants, voices of Native leaders and others as recorded in the literature, and legends and histories written by both Native and non-Native historians. I have also shared and checked this story with dozens of people in and from WRR.

Restorying Northern Arapaho Food Systems for Sovereignty

> *We are all human beings. Every one of us has a tribal ancestry and we have a genetic memory and encoded on that genetic memory is the experience of our individual and collective evolution. The information is there, because we're human beings the knowledge of all those experiences are with us.*
>
> —Trudell (2008, p. 319)

In the Beginning

The land of this world and the Arapaho people were born and borne on the back of the Turtle (see, for example, Dorsey & Kroeber, 1997; King, 2005).

Most of Our Story

The ancestors of the original Arapaho bands journeyed into North America, surviving on what the land had to offer. Foreign intrusion interrupted the recording of our histories in this time, knowledge that should have been shared with my generation today through storytelling, from one generation to the next. However, regardless of how much we know now about this period, starting with our creation and arrival in North America, it clearly composes nearly all of our temporal history (Figure 1).

Piecing together what stories we do have and the relationship of our language to the Algonquin family, we likely lived near the Great Lakes, combining some agriculture with travel for hunting and gathering wild foods (Anderson, 1994; Dorsey & Kroeber, 1997). We may also have, or instead, centered our lives in the Great Plains that are now South Dakota, Eastern Wyoming, and Northern Colorado. Either way, during that time, we cultivated some of our food and likely gathered and hunted for the rest. This included the buffalo, who

once ranged in the tens of millions across most of what is now the United States. The buffalo not only provided us with food, tools, clothing, and shelter, but also gifted us our ceremonial lodges (see stories 6 and 9 in Dorsey & Kroeber, 1997).

As with all humans at that time, lives were generally shorter than they are now. However, as one storyteller noted, *A long time ago the Arapaho survived on what they could get from nature. … We were a lot healthier people back then* [FD].

Foreign INTRUSION

Then, when Europeans began colonizing North America, everything changed for us, including our food system.

Pushed west, but gaining guns and horses (1700s–early 1800s)

As colonizing Europeans forced Indigenous peoples of the east off their lands—via disease, direct violence, and displacement—the Indigenous people of central North America, including the Arapaho, were slowly pushed west. For example, in the early 1800s, Lewis and Clark mention meeting Arapaho people in what is now central Colorado (Hilger, 1952). In 1780, the Arapaho population was approximately 3,000 and the food systems of the Indigenous people generally who were migrating out west were evolving rapidly with the new tools they acquired from Europeans (Lowie, 1982). Given the destruction this foreign intrusion would ultimately wreak on my people, I find some irony in describing this period as, in some ways, a golden age for food provisioning. Guns and horses made hunting for food, especially buffalo, so much easier (Schilz & Worcester, 1987). Many Arapaho people lived in and around what is now Rocky Mountain National Park, where they followed the buffalo through the mountain area (Toll, 2003).

Making treaties (late 1800s)

As colonizers increasingly intruded on western lands, they begin to erode the Arapaho way of life and our food system. In 1850, the territories of Wyoming, Kansas, Nebraska, North Dakota, South Dakota, Montana, New Mexico, and Colorado were occupied by 274,139 Europeans (Anderson & Hill, 1975), putting the Arapaho in direct contact with Europeans and being far outnumbered by them. The U.S. government began demanding that tribes sign treaties, which formally began the policy of separating Indigenous populations in the Great Plains from their land and sustenance and confining us to "reservations." Table 1 summarizes the treaties signed between the U.S.and the Arapaho people and their more particular implications for food systems.

Tribes did not, of course, wish to relinquish our lands and, by this loss, our lives, through any of these treaties. However, as the U.S. government and its citizens intruded farther into and across the west, Indigenous people sought to protect ourselves and our ways of life. Sometimes this included violence, whether directly against U.S. troops or colonizers, or aligning with U.S. troops against other Indigenous communities under increasing competition for the diminishing sustenance the remaining lands could provide. For example, Arapaho and Cheyenne warriors raided wagon trains entering their lands as the buffalo were depleted intentionally by U.S. policy (more on this below) and by disruption of their migration patterns by European colonization and introduction of cows (Berthrong, 1976). The U.S. wished to protect its colonizers and its growing extraction of resources such as gold and forced us into such treaties. For example, one Cheyenne leader at the signing of the Medicine Lodge Treaty noted, "You think you are doing a great deal for us by giving these presents to us, but if you gave us all the goods you could give, yet we would prefer our own life. You give us presents and then take our lands; that produces war" (Boissoneault, 2017, p. 3).

Sand Creek Massacre (1864)

> *In the camp all was confusion and noise… [Black Kettle] kept calling out not to be frightened that the camp was under protection… then suddenly the troops opened fire on this mass of men, women, and children. … White Antelope, when [he] saw the soldiers shooting into the lodges, made up his mind [to] not live any longer… he crossed his arms singing the death song.*
>
> —A White witness, George Bent (Bent & Hyde, 1968, p. 155)

When the U.S. government violated the Treaty of 1861 (Table 1), and the Arapaho and Cheyenne elders were forced to agree to surrender their primary hunting grounds, many warriors did not agree. Also by this time, some Arapahos continued to hunt in territories that include what is now eastern Wyoming, while others were trying to sustain a living in the more heavily colonized area of what is now northern Colorado. In addition to fights for territory, some groups raided intruding settlements for food, particularly in the more populated areas around Denver (Scott, 1994). In 1864, one group of (Southern) Arapaho and Cheyenne people was camping at Sand Creek there, with the permission and promised protection of the U.S. government. This group was not involved in such raids. Yet, on November 29, 1864, Army Col. Chivington ordered his soldiers to massacre the group. A group of drunk members of the U.S. military attacked its camp, killing over 100 people, mostly woman and children. They died in the snow, with their bodies mutilated by the soldiers (Roberts, 1984). A U.S. senator of Wisconsin was then called in to investigate the Indigenous people's conditions and found that they were starving because of large-scale corruption by Indian agents (Chaput, 1972). After this massacre, both Arapaho groups, southern and northern, increased their resistance to the growing foreign intrusion.

Buffalo slaughter (1865–turn of the century)

> *The Indian, in truth, has no longer a country. His lands are everywhere pervaded by white men; his means of subsistence destroyed and the homes of his tribe violently taken from him, himself and his family reduced to starvation.*
>
> —U.S. Major General Pope, writing to his supervisor in 1865 (U.S. War Department, 1896, p. 1151)

Under the guidance of General Sheridan and General Sherman, the U.S. Department of War devised a genocidal plan to finish off the remaining Indigenous people of the Great Plains, whether by death or confinement to reservations. This was done by eliminating our primary food source, the buffalo (Smits, 1994). Sheridan described this as "destroying the Indian's commissary" (Phippen,

Table 1. Arapaho-U.S. Government Treaties (all broken by the U.S.)

Treaty: Focus	Food System Implications
Fort Laramie Treaty of 1851: Ensuring tribal land rights and the safe passage of Whites on the Oregon Trail.	Arapaho guaranteed lands stretching across what is today's eastern Colorado and parts of Wyoming, Nebraska, and Kansas. Encroachments disrupted natural migration of buffalo.
Treaty of Fort Wise, 1861: U.S. demands that the Arapaho and Cheyenne chiefs who signed cede most of the land guarantees above.	First formal loss of land by treaty, including most traditional Arapaho hunting grounds and nearly all the land scoped by intruders in 1851.
Little Arkansas Treaty, 1865: Set of treaties with U.S. promising large swaths of reservation lands for Arapaho and others.	U.S. never created most of the promised reservations and took back the land for the few they did create.
Medicine Lodge Treaty, 1867: Three treaties reshaping the reservations promised above, with much smaller areas. Launched the era of reservations.	Included provisions for buffalo hunting rights and 4.3 million acres for a Cheyenne and Arapaho reservation (Boissoneault, 2017).
Fort Laramie Treaty of 1868: U.S. aims to end wars and defend land against intruders with promises of some land for participating tribes (especially the Sioux) and incentives to settle on reservations, such as cash payments for farming.	By this time, the group that became the Northern Arapaho was eking a living from a limited range of prairie with no U.S.-designated land and diminishing buffalo herds. This treaty did not improve their circumstances.

2016, p. 1). A U.S. Army colonel named this more directly with, "Kill every buffalo you can! Every buffalo dead is an Indian gone" (Phippen, 2016, p. 1). With this approach, the U.S. reduced herds of tens of millions of buffalo to just a few thousand or possibly just hundreds.

Move to a reservation (1878)

Some tribes fought for their lives and ways of life by strategically collaborating at times with the U.S. military, whether regularly or just intermittently when useful to defend territory against unrelated Indigenous groups. This may have occurred particularly when such groups had competed for hunting and gathering territory even before foreign intrusion, a competition which intensified as the intrusion depleted resources. Though not perhaps reaching these levels of enemy status, the historical relations between the Eastern Shoshone and Arapaho were fraught, with Shoshone living in what is now western Wyoming and Arapahos in the east, both with food systems anchored by the buffalo. Also, we come from very different cultural and linguistic backgrounds, with the Shoshone arriving in that area from the west, and my people from the east.

The Shoshone also participated in both Fort Laramie treaties and additionally signed the Fort Bridger Treaty of 1868 (also known as the Shoshone Bannock Treaty). That treaty established the "Shoshonee reservation," which included the current-day WRR and much more. The northern group of Arapaho, however, were "granted" no land by the U.S. government anywhere near our home territories. Also, our prospects for one in or near current Wyoming were dwindling, along with our ability to survive in increasingly colonized land.

In spite of some skirmishes between my people and the Shoshone in this period, talks between the Shoshone leader and several Arapaho chiefs, combined with pressure from the U.S. government (who wanted to get the remaining Arapaho onto a reservation), led to the Shoshone agreeing to let the remaining Northern Arapaho move to their reservation in the winter of 1878. Thus began our reservation life.

Reserved Life (1878 to today)

Early reservation life (1878–early 1900s)

Lack of access to our traditional food system forced us onto a reservation, but we did not find much respite from hunger there either. Sherman Sage, a Northern Arapaho man who lived from 1843 to 1944, says of early reservation life that "epidemics, meager rations, poverty, poor housing, and permanent settlement kept the death rate higher than the birth rate" (Anderson, 2003, p. 60). Similarly, one interviewee reflected:

> *I think the problems go back to early Reservation days, they couldn't hunt, fish, and they couldn't grow vegetable gardens. We were a starving people, and there were a lot of malnutrition and health problems, and that's where it started, when we got off of the buffalo and the healthier foods.* [FD]

Having succeeded in either killing or confining most Native Americans of the Great Plains at this point, the U.S. government then rolled out two additional strategies to reduce or eliminate us. One aimed to reduce reservation lands even further by allotting "unused" lands to Whites and privatizing even Native land ownership; this was the Dawes Act of 1887 (also known as the General Allotment Act). For WRR, these losses were compounded by the McLaughlin Agreement of 1905 (Agreement with the Shoshone and Arapahoe Tribes of Indians Belonging on the Shoshone or Wind River Reservation, 1905). This agreement, specific to WRR (which by this time was called, in that Agreement, "The Shoshone or Wind River Reservation"), ceded nearly 1.5 million acres (607,000 ha). Though some of these lands were later restored, these policies as combined enabled Whites to found the city of Riverton on our land and many farms on our best agricultural lands. As one person noted:

> *I have mixed feelings about the way the land was acquired and the way it was homesteaded and opened up with the tribes not in a good bargaining position to do anything about it, and then all the money went to the wet irrigators and the wet system and very little to the reservation side.* [FD]

The government also founded its cultural genocide strategy of boarding schools, starting with Carlisle Indian Industrial School in Pennsylvania in 1879. These schools were designed, as one Army captain put it, to "kill the Indian in him, and save the man" (Lomawaima & Ostler, 2018). The schools treated captive students so terribly that often the "man" was killed also. The remains of five Northern Arapaho teenagers who died and were buried at Carlisle were recently returned to us. However, WRR also had two local boarding schools. One, which still exists today as a day school, was the St. Stephens Mission. Today, some recall this school as helping to show the way toward producing enough food on WRR to sustain ourselves. For example, one elder recalled,

> *I've been talking with one of the elders around who was born in 1924, and he had gone to school at St. Stephens in 1930; it was a self-sustaining community. They had their own beef, chickens; they did all their own processing. They grew huge gardens, and that supported everybody.* [FD]

Also during this period, federal agents established demonstration farms and made other efforts to encourage Arapahos to begin our agricultural lives again. However, after generations of hunting and gathering on the plains, alongside the physical and emotional toll of living on a reservation, these efforts did not take root.

Learning to live on WRR (early to mid-1900s)
Government-issued food rations, aimed to lure increasingly starving Indigenous people to reservations, starting in the late 1800s. By the early to mid-1900s, these commodity foods had become staple parts of our diets, including the invention of fry bread, made with the flour and lard provided (Vantrease, 2013). Through the federal gardening promotion programs of the two world wars, home gardening was also increasing. We also began hunting again, mainly for small game, but also able to find pronghorn, deer, and sometimes elk or moose. As one person remembers fondly,

> *When I was growing up me and my sisters and brother-in-laws would go hunting and get an elk, and then they would skin it and butcher it, and the hindquarters and meat would go on the table, and my Mother would be sharpening the knives. And then we would all sit around and then that's when we would slice the meat.* [FD]

Also, a few Arapaho families began farming and with some federal support, the tribe founded the Arapaho Tribal Ranch in 1940, with about 5,000 cattle (Wilson, 1972), which is still in operation today (http://www.arapahoranch.com/). One elder recalls, *I see where people were a lot closer, family members especially when we harvested our, our grain or our fields in the fall time* [FD].

Transition from starving to stuffed (from the mid-1900s)
Within the constraints of reservation life and the traumas of this history revisited on our communities, families, and bodies, the 1950s and 1960s were a nutritional recovery period of sorts for us, in between starved and stuffed.

Young tribal leaders came home from WWII as respected heroes. What I will call the U.S. food machine, of both federal feeding programs and industrial food processing, were becoming established and available to our families in WRR. Cooking and ranching skills were being passed down to younger family members, and there was an influx of goods such as cars and farm equipment. Gardens became common, partially thanks to the tribal arms of the Victory Garden programs (Lawson, 2005). Two tribal members recall how things were growing up on the reservation in this period:

> *When I was growing up my folks had a big old huge garden, and we never bought food from town, and when we got hungry we just run out to the garden and get us a turnip or carrots or something then we'd take off again, we'd go cruising, or go back to the river to swim, or horseback riding, we always had something to do.* [GR]

> *When I was young, we still survived on a lot of wild game—deer, elk, elk meat, and we'd even eat rabbits and pheasant.* [FD]

Community feasts were still an important part of tribal members' diets, as the wives of elected

committee officials (who were nearly always men) provided stew, fry bread, and chokecherry gravy for Christmas feasts. Such feasts included dancing and hand games until one in the morning, and losers of the gambling would provide meals for the next night's games. These meals would sometimes include ham hocks, dried corn, Indian corn, and a cow or big game animals such as deer and elk. A Northern Arapaho tribal elder recalled the early 1950s when community and tribalism were very important in providing nourishment to all people in the community:

> *We used to have a Christmas Committee who would raise money to have feasts. Everybody took part, and people would go eat, then dance, they would give them extra meat and filled their soup buckets to take home.* [FD]

Overall, in the 1950s, we were living on wild game (both big and small), the government rations, and what could be grown in home and community gardens. The national-level trends of switching to getting produce and other food from grocery stores came more slowly to the reservation. New things like candy and pop would be given as treats, and divided out to kids in portions because they were expensive. Tribal members on the reservation canned a lot of the produce they grew, and 4-H programs also helped to keep farming and gardening intergenerational.

In the 1960s, we began to receive checks from the government for the natural resources extracted from our land. Before this time, people generally did not have money unless they had a job, and jobs were rare. The food commodity programs also became a more reliable source of food for us. The food shared during annual feasts and beyond immediate family was increasingly sourced from the conveniences offered from grocery markets and focused on what White people call "nuclear" families. Many participants explained that during this time they "just got away from that," referring to things like language, sustainability, sharing, tribalism, culture, and happiness, for example:

> *They got away from creating their own food from scratch, and bought the products and they would make a stew or a meal from that processed stuff, and not create a dish from scratch anymore.* [FD]

Trauma + U.S. food machine = Disparities, diabetes, and death (from the 1970s)

By the 1970s, the effects of foreign intrusion on the Northern Arapaho food system were relatively complete. Historical trauma is the culmination of and reaction to the massive acts of violence and oppressive conditions that have been inflicted on a group, which are now embedded in every fabric of their society (Yellow Horse Brave Heart, 2003). The trauma of the transitions above (including the cultural genocidal tactics of boarding schools) combined with per capita cash infusions from mineral royalties had nearly severed us from our traditions and embedded us in the mainstream capitalistic economy, albeit with meager opportunities to participate in the waged economy. For example, even families who hunted often no longer did the traditional processing of their own wild game, including hanging the meat outside the house so people would stop in to visit and get a portion. One person lamented: *We've just gone, gotten away from that. Nobody does that anymore out here. It's much easier just to go to the store and buy, buy what you need and that's not always healthy* [FD].

The impact of the USDA Food Distribution program on the Native American diet was also a form of intrusion when Native Nations were given mass quantities of unhealthy and culturally inappropriate foods. This dietary change hit us with a growing supply of the sugar, fat, and salt found in the canned pork, canned chicken, canned beef, butter, corn syrup, and cheese. The program also led toa lack of fresh fruits or vegetables. People relied on unhealthy commodities in a community that was still poverty-stricken (Mailer, & Hale, 2013). As one person noted, *That's where our biggest health problem comes from, those canned commodities, and that's what contributed to obesity* [FD].

Similar to the rest of the U.S., we also increased our reliance on fast, industrial, processed foods, particularly in the 1980s and '90s. One Arapaho tribal member and mother of three recollected that *In the '80s, you know here comes the pizza, some sodas, fast food, so when I was working and never had time, that's what my kids would get, they were*

kind of a little bit hefty in them days [FD]. Another lamented that today, *so a lot of people don't grow, they don't grow vegetable gardens, they don't grow fruit trees, so they get that a lot from the town, neighboring towns. When we got away from that, that's when a lot of the health problems started* [FD].

One result has been that the Native people of WRR have some of the worst health in the nation, often even in comparison with other Indigenous communities in the U.S. (Porter, Wechsler, Naschold, & Hime, 2019). As a Northern Arapaho tribal social worker reported, *I work with a lot of kids, and some of them have diabetes. And it's just really hard for them because they just want to be kids and they have to monitor their blood and what they eat, and they just seem so tired of having to do that every day* [FD]. At the same time, many of us are food insecure; as she also notes, *A lot of instances, they're basically in survival mode, and there's children that go to school, and hoard it because a lot of times they were deprived of just basic food, and they're afraid of being hungry so they'll take a piece of bread in their pocket* [FD].

Reclaiming Food Sovereignty (the Next Seven Generations)

I did not grow up hearing our stories told in traditional ways. However, some I have caught in whispers, or fragments. One of these stories is that the seventh generation after the onset of the brief (compared to our overall history) but brutal foreign intrusion into our daily lives would rise to help restore health and sovereignty to our people. Some say that this generation's time has arrived, with my generation.

I am in my late 40s. Many of us from my generation, including many of my elementary school classmates, are no longer with us. Whatever the most proximate causes, none of the deaths I know of have been, in a larger sense, "accidents." Those of us who remain, as in the previous seven generations, are survivors. We are resilient. And, with the Eastern Shoshone and many other Indigenous Nations, we are reclaiming our food systems, our health, and our sovereignty. Here are some examples of how we are doing this in WRR.

In WRR, Blue Mountain Associates helped to found the first tribal farmers market in 2010. Deploying funding from the Food Dignity project, they then expanded the market, formed a steering committee, supported home gardens and chicken coops, helped such producers become vendors, and more. This year, they added the first winter market season. Also, since 2012, Blue Mountain Associates has been providing the garden installation and support for the pilot and then the full-scale Growing Resilience project.

In 2013, one of the Arapaho leaders I spoke with wished to see us return to eating buffalo:

> *What I'd like to see is the buffalo come back to the people. And I'd really think the Tribe should consider getting land for the buffalo. I mean the buffalo are part of the Arapaho people, it is still in our ceremonies. The buffalo still symbolizes strength and everything that is good. And if we went back to the buffalo diet, our people would become happy again.* [FD]

She also worried about some barriers to that, noting, *But they are so accustomed to eating that beef.* Then, in 2016, the Shoshone tribe introduced a herd of 10 buffalo. With one calf born and 10 additions to the herd in 2017, they are now at 21. The vision is for a herd of a thousand to range free again on this land and to again become a source of sustenance (Voggesser, 2017).

While Blue Mountain Associates has continued its food sovereignty efforts, other groups have also begun leading this kind of work. For example, the Restoring Shoshone Ancestral Food Gathering group is reclaiming and sharing gathering and cooking practices. The Growing Resilience Community Advisory Board, in addition to overseeing that project, has established a new community demonstration garden. A multiyear effort to found a producers cooperative and more, called the Wind River Food Sovereignty Development Project, recently received federal funding (U.S. Department of Agriculture, 2018). The Growing Resilience project overall is supporting nearly 100 families in creating and nurturing home food gardens. As one participant said, *this garden isn't just for me, it's a way to carry on the tradition* [GR].

People have expressed hope, ideas, and some new perspectives on the future of our food system. Growing our own food was one theme mentioned by interviewees during Food Dignity (which was

part of the evidence of interest that spurred my co-author to suggest the Growing Resilience project). For example, one person told me:

> *I'd just like to see, you know, like programs like you're involved in, to be increased to get more resources to, to reach more people. Because I think that we need to go back to living off the land, being outside, appreciating the outdoors and, and seeing things grow and getting the, the satisfaction of, of nurturing plants and things like that.* [FD]

Some of the gardeners in the Growing Resilience project said they want to see food growing spread:

> *I think one way is to get gardens in schools, having each grade be responsible for a greenhouse at the high school, it would be nice getting them involved in gardening.* [GR]

> *In the community, too, if everybody knows that you're growing a garden, they're like "Hey [she's] growing a garden, we could do that." A lot of people don't have positive out here, they have so much negative, so if they could do that and put all their energy into that it will help them be less stressful and responsible and feel like they accomplished something rather than not doing anything.* [GR]

Also, one person challenged the commodified history that inserted fry bread into our food system:

> *When I was younger, people would call fry bread traditional food, but it isn't really a traditional food. It has kind of evolved into traditional food for us, because anytime you have a gathering, you always have fry bread.* [FD]

Another saw some hope, albeit tempered by experience, that we were shifting toward healthier foods in WRR:

> *It seems to me like there's a lot more interest in eating local and eating more organic, but having been a child of the '60's in a lot of ways, there was a big movement back then too, sort of like the hippie movement. I am a little concerned that it, like in the '60's, that it's a trend and it'll die out.… I hope this is a revolution.* [FD]

Implications and Conclusion

Every Sovereign Nation in what is now the U.S. shares an overarching story of millennia where we fed our people and nurtured our well-being in relationship with one another and the land. Although our collective lives then included struggle and suffering, including sometimes wars or starvation, they also were our own to lead, in our own ways. Every Sovereign Nation in what is now the U.S. also shares much more recent overarching story of foreign intrusion. Our struggles and our suffering multiplied as our people were killed—by starvation, disease, despair, and direct attacks—and by having our land, foodways, and children stripped away.

One way to tell this story is from the perspective of the foreign intruders, for example, of Manifest Destiny. Another way to tell this story is how I have done so here, with and of the Northern Arapaho people, about the history of our food system, the loss of food sovereignty and health through intrusion, and our nascent efforts to reclaim both.

In this restorying, people spoke of language, culture, food, health, and gardening "getting away" from us as a people. We associate the loss with what is missing in the community today, and are now working to get it back. Food system work and fighting for our food sovereignty are crucial means for all Indigenous nations to reclaim all of this—our culture, history, health, and political sovereignty.

I hope other Indigenous nations hear parts of their own stories in this restorying in the WRR of the Northern Arapaho food system, and I hope this example will inspire others to reclaim our collective and specific stories as we restore Indigenous food sovereignty across North America. It offers, in a small and short way, rigorous and Indigenous storytelling about one Indigenous food system, as Dunbar-Ortiz (2014) and Treuer (2019) have recently done for our overall collective histories.

I would like to conclude with a revolution—including a revolution of seasons, as we pass out of

the winter of foreign intrusion into a spring of Northern Arapaho, Eastern Shoshone, and Indigenous Nation food sovereignty. I have strived to tell this story in a good way, with hope that it may help us find our way. 

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Our hands at work: Indigenous food sovereignty in Western Canada

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Abstract

Food sovereignty has recently emerged as a means of addressing pervasive food-related problems in many Indigenous communities in Canada as well as around the world. This is particularly important for Indigenous people who still face threats to their food systems directly stemming from colonialism. Stories of community-based Indigenous food sovereignty are presented in this paper. Outcomes are summarized using a circle metaphor that describes four key elements of Indigenous food sovereignty that emerged from this research: history, connection to the land, relationships, and identity. Indigenous food sovereignty requires that we move beyond access to food, and critically interrogate Indigenous relationships to food. This is founded upon the notion that people should be able to be self-determinant in their own food and cultural traditions. Progress requires a shift in how Indigenous food relationships are understood and incorporating Indigenous worldviews and perspectives as part of a larger resurgence movement.

Keywords

Indigenous Food Sovereignty, Traditional Food, Indigenous Research Methodologies, Resurgence, Self-Determination

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Introduction

Many Indigenous peoples in Canada experience challenges in accessing fresh, affordable, and appropriate foods that are the mainstays of Indigenous diet and cultures. Remote, isolated communities face particular obstacles in the realm of food security. On average, the rate of food insecurity among Indigenous peoples in Canada higher than

among their non-Indigenous counterparts (Health Canada, 2007). A long history of colonization, including the destruction of animals, land, waterways, and connections to Indigenous ways of life, has deeply impacted Indigenous peoples' well-being, self-determination, and food security (Kelm, 1999; Lux, 2001; McCallum, 2017; McLachlan, 2014; Shewell, 2004; Truth and Reconciliation Commission, 2015).

However, Indigenous communities are responding to these challenges through a resurgence of traditional relationships between peoples, land, food, education, and ceremony. Indeed, these elements are part of an interconnected whole. Food sovereignty, while a "living reality" for Indigenous peoples in Canada, has recently emerged in the literature as a means to understand and document the connections between Indigenous peoples and their food systems (Morrison, 2011). Expressions of food sovereignty vary from place to place and nation to nation. In Canada, much of what has been documented involves gardens and greenhouses (First Nations Health Council, 2009; Mundel & Chapman, 2010; Skinner, Hanning, & Metatawabin, 2014; Stroink & Nelson, 2009). Yet Indigenous food sovereignty takes many forms and engages in spaces beyond gardens and waters and land. Many of these initiatives are embedded in community, and there has been little opportunity for communities to share and learn from one another. The food issues facing Indigenous communities continue to be presented in negative ways, and good news stories and Indigenous voices are often missing from media accounts (Follett, 2010; Sloan-Morgan & Castleden, 2014). Tuck (2009) has described the harm of "damage centered" research that continues to perpetuate notions that Indigenous peoples and their communities are damaged and exist in a state of defeat. Further challenges include the presence of racism in media accounts (Anderson & Robertson, 2011; Harding, 2006) and the misrepresentation of Indigenous voices and positions (Follett, 2010). However, good news stories can "facilitate, through the narrative tradition, the successful exchange of information" (Vazquez, 2011, p. 2) within and among Indigenous communities. Sharing good news stories in a broader context would provide an opportunity for the public to learn how to ensure the health and safety of the land for future generations (Cajete, 1999).

This contribution creates a new discourse around good food stories in Indigenous communities based on a series of interviews with knowledge holders, Elders, harvesters, activists, and land-based peoples in an attempt to understand what Indigenous food sovereignty looks like in western Canada. These stories offer an alternative approach: one in which Indigenous peoples are represented, can speak to the damages of colonialism, and have opportunities to direct their food and land-based projects in a way that promotes and protects food, culture, and land.

Food Sovereignty

To articulate the struggles of the political and economic systems characterizing food production, the term "food sovereignty" was proposed by La Vía Campesina in 1996. As Wittman, Desmarais, and Wiebe (2010) share, Indigenous communities were no longer guaranteed local access to culturally appropriate and nutritious food. Food sovereignty has been described as:

> . . . the right of peoples to decide and produce their own food. It is a political right to organize ourselves, to decide what to plant, to have control of seeds. Food sovereignty is a very broad concept that includes the right of access to seeds, the right to produce, to trade, to consume one's own foods. . . . [I]t is a concept that is linked to the autonomy and sovereignty of peoples. (Masioli & Nicholson, 2010, p. 34)

While La Vía Campesina's view of food sovereignty works toward developing community independence, it is important to note that it does not necessitate the sole independence of community food production (Patel, 2012). There is room for communities to create their own visions of food sovereignty and define their own food systems. Food sovereignty also advocates for strengthening relationships to food, to the land, and to food providers—who, in many instances, are women. One of the strengths of food sovereignty is its campaign to end violence against women (Patel, 2012;

Wittman et al., 2010).

The food sovereignty movement in Canada has been visible largely through the National Farmer's Union and the Union Paysanne, nonprofit organizations working in the international agriculture arena such as the Unitarian Service Committee of Canada, Indigenous movements such as the Working Group on Indigenous Food Sovereignty, and urban food security networks such as Food Secure Canada, although less information has been shared explicitly about the work of Indigenous food sovereignty efforts (Andrée, Cobb, Moussa, & Norgang, 2011; Desmarais & Wittman, 2014). Despite the promise of these endeavors, food sovereignty in Canada is not without its challenges. The displacement of family farms, the relatively short history of agriculture in Canada, and the fragmentation of human and land relationships resulting from urbanization are all issues that need to be addressed (Desmarais & Wittman, 2014).

The complexity and diversity of Indigenous food systems are a further challenge to food sovereignty in Canada. Indigenous food systems fall into the realm of cultural and political resurgence and include "a sovereignty of having the right to produce culture" (Masioli & Nicholson, 2010, p. 34).

Indigenous Sovereignty

This discussion focuses on the intersections between Indigenous sovereignty and Indigenous food sovereignty (IFS). For example, it is nearly impossible for peoples of the land to obtain food from the land if that land is not protected (Morrison, 2011).[1] With myriad definitions and understandings of sovereignty for Indigenous peoples (see, for example, Grey & Patel, 2015; Porter, 2005; Varese, 2010), the evolution and applicability of the term are problematic. Current constructs of Indigenous sovereignty have been criticized as incompatible with traditional Indigenous notions of power and control (Alfred, 2009). Alfred has argued that the contemporary sovereignty discourse remains grounded in Western goals of sovereignty and colonialism. Daigle (2017, p. 4) shares how "Eurocentric notions of sovereignty that are based on Lockean concepts of land as property" are a stark contrast to Indigenous epistemologies in which land is seen as an inherent responsibility that Indigenous people have with creation (Morrison, 2011). Sovereignty discourses must respect values, languages, and identity as part of Indigenous epistemologies that ultimately arise from the land. According to Simpson (2008), land is key:

> In the times prior to colonization, Indigenous peoples lived in independent, sovereign nations governed by complex political and social systems. Rooted in the land, with a strong spiritual and religious foundation, these systems ensured our citizens were taken care of and that contentious issues were resolved in a peaceful and just manner. (p. 13)

Western notions of Indigenous sovereignty are at odds with Indigenous food sovereignty specifically. In the context of food sovereignty, Desmarais and Wittman (2014) have argued for stepping back from the historical and legal meanings of sovereignty to focus on supporting relationships, connections, and interdependency between communities. From a conversation with Ray Halbritter, an Oneida lawyer, Alfred (2009) shares Ray's views on sovereignty as "self-sufficiency" (p. 220). Perhaps this is the lens from which we can move the discourse around Indigenous food sovereignty forward. The ability to self-determine both food and political systems works toward achieving harmony and balance in community and ultimately supports well-being. Self-determination must exist within and beyond food to include the ability of Indigenous peoples to self-determine their own futures.

Indigenous Food Sovereignty

In practice, Indigenous food sovereignty has been visible in communities around the world for thousands of years. Though described as a living reality that sustained Indigenous peoples for millennia,

[1] While Indigenous cultures in North America and around the world contain a multitude of cultural expressions, some foundational concepts are similar. Importantly, the presence of land as part of identity, history, and spirituality is used here to describe Indigenous peoples as people of the land (Dumont, 2014; Morrison, 2011).

Indigenous food sovereignty has more recently gained renewed strength as a movement and a way of life to address the broken connections between people, land, water, food, and culture. In the context of colonial histories, Indigenous food sovereignty begins to diverge from food sovereignty to focus on such issues as treaties, government policy, and land reform, all issues that prevent people from practicing their culture (People's Food Policy Project [PFPP], 2011).

The study of Indigenous food sovereignty in Canada first arose due to grassroots movements such as British Columbia's Working Group on Indigenous Food Sovereignty (WGIFS), and then later through the work of Food Secure Canada's Indigenous Circle of advisors (PFPP, 2011; WGIFS, 2011). These groups fought for the redistribution of land and for land reform legislation to ensure that people living in traditional territories had access to food from their land (PFPP, 2011; WGIFS, 2011). As Morrison (2011) affirms, "Indigenous food sovereignty is ultimately achieved by upholding our long-standing sacred responsibilities to nurture healthy, interdependent relationships with the land, plants, and animals that provide us with our food" (p. 100).

The importance of self-determination as part of Indigenous ways of life, including Indigenous food systems, has been stated by numerous authors (Bell-Sheeter, 2004; Cidro & Martens, 2014; First Nations Health Council, 2009; Morrison, 2011). The sacredness of food has also been articulated as a critical element of Indigenous food sovereignty (LaDuke, 2005; Morrison, 2011; PFPP, 2011).

Indigenous food sovereignty initiatives have been documented by researchers across Canada and the United States. For example, the White Earth Land Recovery Project in Minnesota and the fight to protect their wild rice from genetically modified seeds have been shared (LaDuke, 2005). In Manitoba, Rudolph and McLachlan (2013) discuss the need for politicized action to support IFS. Rudolph (2012) has also shared her master's research around land-based skill development. IFS has also been examined through a country foods program in O-Pipon-Na-Piwin Cree Nation, Manitoba (Kamal & Thompson, 2013). Cidro and Martens (2014) found that despite experiences of food insecurity, participation by urban Indigenous peoples in traditional and land-based food activities contributed to feelings of working towards Indigenous food sovereignty. At the Urban Aboriginal Garden Project in British Columbia, Mundel and Chapman (2010) discovered that participants viewed gaining more food skills to be empowering and decolonizing. In her work with Anishinaabe communities, Daigle (2017) found that "the role of food harvesting and sharing practices has been central to this larger process of decolonization and self-determination" (p. 13). Clearly, understandings of Indigenous food sovereignty are expanding into new realms and territories as part of a larger resurgence.

Research Design

Although the design for this research evolved over time, an Indigenous research framework was used to help guide the process and position Indigenous knowledge at the forefront (Kovach, 2009). As Battiste and colleagues note (2002), this is particularly important for decolonizing research. Elements of the framework included an epistemology based upon the value of experiential and lived knowledge, along with guiding methodological values of respect, relationships, and reciprocity (Hart, 2010; Kovach, 2009; Wilson, 2008).

It is here that I situate myself in my research and writing. As part of my culture, I understand that I am accountable to my research participants, but also to the land, water, sky, and beyond. The relationships formed through this research supported my own cultural identity and helped me understand the ways that identity and self-determination intersect.

Using existing contacts and Internet searches, along with a snowball approach, 24 Indigenous food initiatives were identified in western Canada (Table 1), and 32 individuals were interviewed regarding these projects. These initiatives are located on reserve, in Metis territories, and in some cases, a combination of urban and reserve lands. Approval from the University of Manitoba Fort Garry Campus Research Ethics Board was obtained prior to conducting interviews. All but one participant declined anonymity on their consent forms, and thus their names are associated

with their words. Interviews were audio-recorded with the permission of the participants and transcribed by a research assistant, except in cases where participants asked that I transcribe their interview. Most of these interviews took place over the phone, although I made every effort to meet in person when requested. Participants were asked to describe their food initiatives and to share any promising practices and any challenges they experienced.

Table 1. Summary of the Projects Involved in this Research

Project Name	Location	Project Focus
Ahms Tah Ow School Garden	Sliammon First Nation, BC	school garden
Alexis First Nation Greenhouse	Alexis Nakota Sioux First Nation, AB	greenhouse
Back to the Land Camp	Peguis First Nation, MB	traditional foods education
BC Food Systems Network Working Group on Indigenous Food Sovereignty	BC	research, action, and policy/advocacy
BEADS Program	Canim Lake Band, Shuswap Nation, BC	market garden cooperative
Cha Me Ta Ha-uuk Hesquiaht Project	Hesquiaht First Nation, BC	community garden
Coastal Stewardship Network	Gitga'at, Haida, Haisla, Heiltsuk, Kitasoo/Xai'Xais, Metlakatla, Nuxalk & Wuikinuxv First Nations, BC	biomonitoring and ocean stewardship
Community Based Monitoring	Athabasca Chipewyan First Nation & Mikisew Cree First Nation, AB	biomonitoring program
Dog Creek & Canoe Creek Community Garden	Dog Creek & Canoe Creek Communities, Canoe Creek Band, Secwepemc First Nation, BC	market garden
Cree8 Co-op	Flying Dust First Nation, SK	market garden cooperative
Earth Boxes	Alexander First Nation, AB	school garden
First Nations Wildcrafters	Tseshaht First Nation, BC	culturally sustainable forest management training
Four Arrows Regional Health Authority Food Security Programs	Island Lake Communities; Wasagamack, Ste. Theresa Point, Garden Hill & Red Sucker Lake First Nations, MB	community garden and poultry
Indigenous Food First Website	Canada-wide	traditional foods education
Ladybug Garden & Greenhouse Project	T'Sou-ke First Nation, BC	traditional foods education
Masset-Haida Gwaii Farm to School Salad Bar Program	Haida Gwaii, BC	traditional foods education and healthy eating program
Matheson Island Community Garden	Matheson Island, MB	community garden
Muskoday Organic Grower's Co-op	Muskoday First Nation, SK	market garden cooperative
Nelson House Country Foods Program	Nisichawayasihk Cree Nation (Nelson House), MB	country foods program
Splatsin Cultural Use Market Garden	Splatsin Band, Shuswap Nation, BC	traditional foods market garden
Traditional Foods & Healthy Eating Program	La Ronge, SK	traditional foods education
Turtle Mountain Metis Community Garden	Turtle Mountain Local Metis, MB	community garden
Water Guardians Program	Pine Creek First Nation, Sagkeeng First Nation, Fisher River Cree Nation, & Duck Bay, MB	biomonitoring education program
Vancouver Island Traditional Foods Conference	Various- Vancouver Island & Coastal Communities, BC	traditional foods education

For the final phase of the research, participants were invited to an Indigenous food gathering on the land in Peguis First Nation. No recordings or notes were taken at the event, and my observations and experiences of it have been written elsewhere. This component of the research was ceremonial, deeply personal, and was written as a narrative in which I examined self in reflection to the event (Martens, 2017).

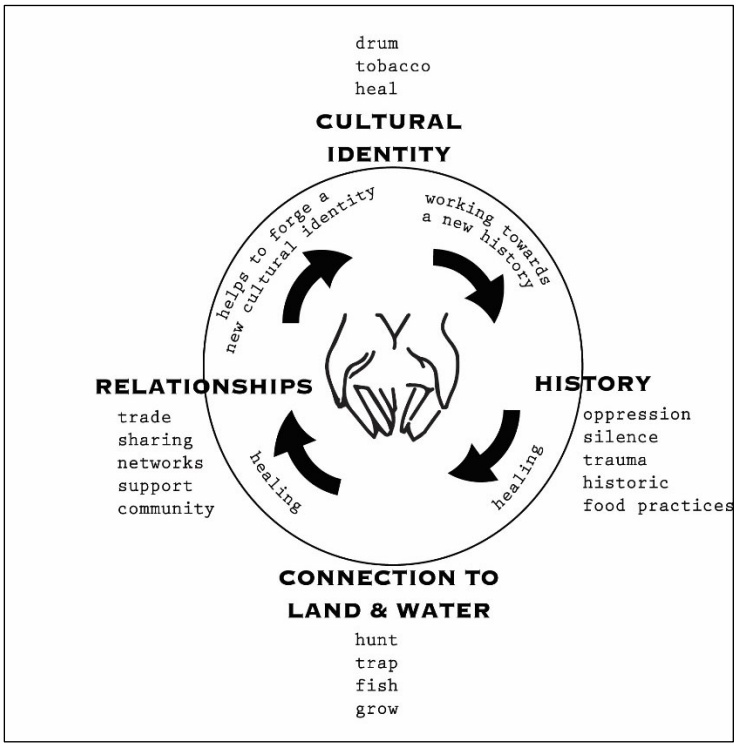
Transcribed interviews were analyzed by hand using a tactile approach of keywords on a series of papers covering my floor. These keywords were based on the symbol (Absolon, 2011; Kovach, 2009) of hands that had appeared throughout the research and later used with a circle model with the guidance of my committee and Elders. On the advice of one of my committee members, I explored the use of metaphor in Indigenous research and realized that many of the interviews talked about hands being involved in food work (Absolon, 2010; Hart, 2002; Lavallée, 2007). In creating key themes, I wrote about ways that hands appeared and were discussed in the interviews (Martens, Cidro, Hart & McLachlan, 2016). One Elder, in particular, sat with me as I laid out the various pieces of paper containing key themes from the research. It is important to note that he did not influence the process but rather listened and asked questions about why I had placed things where I did. The results are presented as the four elements of Indigenous food sovereignty (Figure 1). Importantly, this circle model and the four elements were presented back to the participants, revisions were made to the model based on their feedback, and I was given permission to move forward on their behalf. Figure 1 presents the model that I created using the interviews and feedback from participants.

Results

Throughout my interviews, the image of hands appeared repeatedly and created a fitting metaphor or symbol for the research. The following poem emerged from a journal I kept during the process.

I think of how those hands plant a seed or tend to the earth. I think of those hands as filleting the fish or skinning the muskrat, tanning the hides. I think of those hands as healing with the power of touch, knowledge, and prayer, through the work of our healers. Or the hands that pick the medicine that make us well. They are the hands that sound the drum to awaken our spirit. The hands that reach out to help and share our food with family and friends, the hands that stir the pot of stew. They are the hands that write letters to government or hold protest signs when our land is in danger. They are the hands that can extend out to our neighbors, across provinces and territories to share and trade and create a powerful network of food. And they are the hands that are brown, or red, or white, or some combination of those colors, that speak to our ancestors; they remind us who we are and where we come from. They are the hands that have been oppressed—tied by colonialism—or slapped by government, by residential schools, by racism. And of course, there are the hands of oth-

Figure 1. Elements of Indigenous Food Sovereignty



> ers that have covered our mouths, trying to silence Indigenous voices. (Martens, 2015, p. 37)

Figure 1 presents the four elements of Indigenous food sovereignty—history, connection to the land, relationships, and cultural identity—revealed through the participants and my own involvement in the projects. Each of the four elements will be discussed below.

History

Indigenous food sovereignty is a living, breathing way of life found in the past and present and envisioned for future generations. For Indigenous peoples, hope remains despite the history of starvation, control, and colonization of food systems (Burnett, 2010; Carter, 1990; Daschuk, 2013; Lux, 2001; Mosby, 2013; Shewell, 2004). In discussing their food programs and projects, participants described the need to return to the past when food came from the land and teachings came from Elders. In talking about the Muskoday Organic Grower's Co-op in Saskatchewan, Harvey Knight explained, "We're also going to our Elders to re-learn our history of agriculture that goes back for thousands and thousands of years. We're reclaiming our right to grow these Indigenous foods. . . . We live with them, we co-existed with them on an equal basis, we have agreements made once a long time ago."

In British Columbia, The Traditional Foods Conference, once held annually on Vancouver Island, has helped provide more links to the past for people all over the island, providing support for re-invigorating traditional food practices:

> And so the traditional foods conference, on a personal level, really enabled me to be able to be more well equipped and more knowledgeable about traditional food systems in my particular area and to not only take that knowledge to and know more about foods, but actually take it another step further and breathe life back into those practices. (John Rampanen)

Acknowledging the losses of land and culture through colonialism has been critical in order for these communities to move forward. Research participants described multiple pathways towards reclamation. As Douglas Hart explains, the Nelson House Country Foods Program in Manitoba has experienced an increase in community engagement: "People utilize it. Every day, they come and get stuff for themselves. Whatever we have. Moose meat, caribou. We berry pick, too. And we have our community garden." By providing opportunities for people to go back to the land and back to land-based diets, history lives on.

Connection to the Land

Land is fundamental to Indigenous ways of knowing and being. King (2012) shares, "land has always been a defining element of Aboriginal culture. Land contains the languages, the stories, and the histories of a people. It provides water, air, shelter, and food. Land participates in the ceremonies and the songs. And land is home" (p. 218). Indeed, it is the foundation for all learning and development. Often, Indigenous food sovereignty is considered to be specific actions taking place on the land: the harvest, the hunt, the gather, and the seed and sow. And yet, spending time on the land and with the land takes many shapes for Indigenous peoples. (Re)Learning and practicing traditional languages, for example, are land-based practices. Indigenous languages are a form of communication with creation that can help to bring people and place together.

In talking about First Nations Wildcrafters, an Indigenous organization that works with and trains others on sustainable forest management, Keith Hunter explains the fluidity of language and the land:

> When I see—my most personal satisfaction is when we see the older ones, not only during mushroom season, but berry season too, when you see the older generation taking the kids out with them, they're telling their stories and the history of the land in their language. That language vitality, the continuity of language, story, and place.

Returning to the land to nourish the body and soul is an often overlooked component of Indigenous food sovereignty, yet it is critical to well-

being. The land can be a source of healing, as Alma Bear describes of her experience with the Flying Dust Cree-8 Workers Co-op in Saskatchewan: "I would just like to move to the garden, because the micro-organisms always get me going. And when I get stressed out, off to the garden I go. I find it so peaceful."

Relationships to the land are also important in helping to fulfill the roles and responsibilities we have made towards the land as caretakers. Mike Christian (Splatsin First Nation, British Columbia) shares how this idea helps guide an agro-forest initiative in his territory:

> So that's another project that we're going through this agroforestry thing, is we're kind of indigenizing what they call agroforestry because it's almost like in reverse. You know, that's how our ancestors used to take care of the land so if you really think when did this start? It started long ago when our ancestors managed the land, right?

Food sovereignty began with ancestors, and not just humans. The water, the soil, the plants, the animals, and everything in between provides lessons, opportunities, and the gift of life.

Relationships

Indigenous food sovereignty embodies a caring quality that extends to the land, water, and each other. IFS embraces an awareness of the intimate connection between people and all of creation. Relationships are the next act of the processes of food sovereignty as described by the participants. These relationships include the physical connection to the land, where hands meet earth and water; and the connections between people, where hands meet hands, and hands meet hearts. Here we can see the practices of gratitude, nurturing, and also accountability. William Gladue, of the Flying Dust Cree-8 Worker's Co-op in Flying Dust, Saskatchewan, notes the importance of working together and sharing to uphold relationships:

> We already have a couple nations that have started their gardens already. And that's by coming and giving a tour of the garden. Basically, just that alone is recognition for us because we're trying to take this project as far as it can go, actually. As far as we're concerned, it's already there, now. And we'd like to keep that momentum going.

Networks of like-minded people that can support and encourage these initiatives are key to increasing awareness of Indigenous food systems. Care within nations is also important. Many Indigenous cultures teach the importance of community efforts to ensure that no one in the community goes hungry. Indeed, for the Nelson House Country Foods Program in Nelson House, Manitoba, that is why the program started. Douglas Hart, manager of the program that gathers and distributes country (or traditional, original, cultural) foods in the community, explains,

> We were supposed to look after the elderly. People who can't hunt, 55 plus. That's how it started. It's not only the Elders. We do it for the whole community, infirm, people are not making enough money, they usually come and get their stuff here. Usually distribute like, it's free, you don't charge them, you just give it away free.

Nurturing relationships also help to build support for community-based food projects. Many of the food projects highlighted depend on the support of volunteer community members. The importance of support for and from the community is critical to these undertakings. Crystal Stewart, treasurer for the Turtle Mountain Métis Garden in Manitoba, shares how support can enhance the process of re-building a food system:

> So, it was amazing how many people said 'oh, no' when we tried to pay them for the use of their equipment, and they'd say 'no, that's quite all right' I'm glad to see the community's doing this. . . . That was Mom's biggest smile about the whole project, was sitting back and seeing all of these in-kind gestures coming in and how unbelievable it was to realize there was such generosity. This day and age you think that doesn't happen as much anymore as in the old

> days when everybody helped each other. But apparently, the generosity's still there.

Many of these food projects brought forward values central to Indigenous communities, such as kindness, sharing, caring, and respect. Participants discussed these values as being key to their culture and the food projects. Importantly, they are the foundation of relationships.

Cultural Identity

Cultural identity is the fourth and final element of Indigenous food sovereignty as described by the research participants. This is the place where how one views the world and lives one's culture helps to develop identity. It sits in your body, your mind, your heart, and in your spirit.

Cultural identity is a deeply complex topic (see, for example, Corntassel, 2003; Weaver, 2001). However, participants shared that by practicing food sovereignty, they experienced a strong sense of belonging and identity. Because many food practices are grounded in cultural and ceremonial practices central to Indigenous ways of life, participants viewed their projects as contributing to a stronger sense of being Indigenous and of building nationhood and community.

Cultural knowledge around food is seen as vital for youth. As a means to transfer knowledge, land-based food practices can support the development of strong, healthy Indigenous communities connected to the land. Gerralynne Cochrane shares her wish for the Back to the Land Camp in Peguis, MB:

> I would like to have this camp year-round. I would like more kids to come out. I would like to go into schools and be able to sit down and talk to parents, teachers, principals. I'd like to get them all together and explain it all to them. Like, children, they're our future. But don't jeopardize their future, too.

Participants also described the role of Elders, language, and women as integral to revitalizing Indigenous culture and identities. Christine George of the T'Sou-ke Nation explains how the Ladybug Garden and Greenhouse Program in British Columbia has expanded to incorporate language and ceremony: "We also take our members and youth out onto our traditional territories for hikes to practice our culture by way of prayers and blessings, exercise, plant identification, and language practices. . . . That's like a classroom out on the beach." Youth and Elder relations are critical to Indigenous food sovereignty processes. Elders are knowledge holders in Indigenous culture, while youth are the gifts of the future.

These food projects help build stronger identities by providing the means to revitalize historical and contemporary food practices grounded in Indigenous epistemologies. Indeed, John Rampanen explains how these relationships were centered with the Vancouver Island and Coast Communities Traditional Foods Conferences in British Columbia, and what it has meant to him on a personal level:

> And being a part of that process has been a magical experience for me, that has really transformed who I am as a person, as a father, as my family to the point, that I've moved myself from the city to my traditional territory in a very rural, remote section of Vancouver Island, to be directly on the land, to be able to harvest those Indigenous foods to be able to live in that lifestyle as opposed to only talking about it.

Discussion

Political Implications

Indigenous food sovereignty, as a concept and way of life, is challenging to describe and even more difficult to define. A significant factor remaining unexamined in this study is how and where political sovereignty relates to Indigenous food sovereignty. This is also true for much of the literature on Indigenous food sovereignty. For this study, all research questions were centered on the community food projects themselves. The research participants made no mention explicitly of political sovereignty. That is not to suggest that elements of political sovereignty were not present in these projects, however. Projects such as advocacy work, returning to a matriarchal system of governance,

and the self-determined research in this area are ways that communities demonstrated the link between food and politics in an attempt to move toward more self-determination.

Conversations around the political implications of food sovereignty for Indigenous peoples and communities would be valuable for the future. Participants did reveal how politics interfered or challenged their food sovereignty initiatives, and so this is an area that needs to be examined from multiple angles. Issues around lack of funding, resources, and support were often viewed as being political but vital to the success of these initiatives. At the same time, I am mindful of Alfred and Corntassel's (2005) argument that political sovereignty is neither adequate nor appropriate for Indigenous peoples, as it is too steeped in the processes of colonization. Decolonizing Indigenous food systems is a multifaceted and deeply individual process. Communities should have the opportunity to confront colonization on their own terms.

Indigenous Food Sovereignty and Research as Self-determination

In seeking research participants, I did not attempt to define the term Indigenous food sovereignty, nor did I create criteria for the initiatives representing Indigenous food sovereignty. I let the communities, individuals, and organizations I spoke with determine whether they felt their project exemplified Indigenous food sovereignty. From there, we moved toward the research process. In talking with participants about what Indigenous food sovereignty looks like, many participants described feelings. They explained how the project felt to them or the people involved in their projects. This speaks to the holistic nature of Indigenous food sovereignty (Absolon, 2011; Morrison, 2011; PFPP, 2011). All the community food projects presented in this study sought to create change and the opportunity to support healthier communities. Health was not seen as merely a physical state, but as a balance between the physical, emotional, mental, and spiritual components of life, or "being" in a state often referred to as well-being (Adelson, 2000; Struthers, 2000).

Indigenous food sovereignty is participatory and action-oriented (Morrison, 2011). In the food projects studied, the heart and hands of the work came together to carry out the tasks and responsibilities set out by Indigenous ancestors. Ceremony, prayer, song, and celebration were used by project participants for a broader, more intentional vision of food sovereignty that included the use of food as healer. Ceremony, prayer, song, and celebration were also used by the project participants to help connect to a greater vision of their project and to work toward food as healing in their communities (Morrisseau, 1998; Stevenson, 1999). In listening to the participants, I was reminded of the words of Cree scholar Michael Hart (2010), who asks that in Indigenous research, we listen with our whole being. This perspective was critical to the processes of this research project and the richness of data that emerged. Nonetheless, Indigenous food sovereignty is challenging to define and means different things to different people—across nations, geographies, and through a variety of circumstances stemming from treaty agreements, residential school experiences, and the impacts of large-scale extraction, for example (Alfred & Corntassel, 2005; Coté, 2016; Daigle, 2017). In order to make space for these complexities, I left the decision about whether a project was a "true" example of Indigenous food sovereignty with those who know their work and communities the best: the project participants.

Self-determination is imperative to Indigenous research. Smith (1999) states: "It becomes a goal of social justice . . . and necessarily involves the process of transformation, of decolonization, of healing, and of mobilization as peoples" (p. 116). Thus, I made space for communities to describe food sovereignty in their own ways. This further aligns with Morrison's (2011) point that there is no singular definition of Indigenous food sovereignty: "While there is no universal definition of food sovereignty that reflects all of the realities of the myriad of Indigenous communities around the world, the underlying principles of Indigenous food sovereignty are based on our responsibilities to uphold our distinct cultures and relationships to the land and food systems" (p. 97).

Indigenous Food Sovereignty as Process

In reviewing the model and the results of this

research, participants were given the opportunity to share their feedback through a set of further questions; however, responding was optional. All participants agreed with and were in support of the model presented (Figure 1). For the 12 participants who responded to the optional questions, one idea became clear: Indigenous food sovereignty is a journey, and it is both ongoing and evolving. These projects were seen as opportunities to build interest within the community, to feed people, to bring back traditional food values and practices, to advocate for the land and for the people of the land, and to re-affirm Indigenous identities. Participants shared words such as "process," "journey," and "pathway" to describe their response to the model, and indeed in reflection of their project as part of the overall study. This was a critical lesson for me. Christine George (Ladybug Garden & Greenhouse Program, BC) positively responded to the model by stating, "there are so many versions by so many nations; every one is different and deals with their Indigenous foods slightly different from each other." Process is key within Indigenous cultures (Cajete, 1994; Simpson, 2002), and it is necessary to have the tools, resources, and supports to move toward Indigenous food sovereignty. The model presented here, in the form of a circle, represents the idea of process within Indigenous food sovereignty; McCabe (2008) explains that the medicine wheel represents *process*. Indigenous food sovereignty, in this study, was not viewed as the end result; rather, it was part of a cycle of doing the work to feed people and continue to articulate the struggle for Indigenous self-determination.

Conclusion

The four elements that emerged through this research project— history, connection to the land, relationships, and cultural identity— help provide a larger foundation for examining Indigenous food sovereignty. The model developed through this research is based on the stories shared by community members and how they saw their voices and work portrayed. Unpacking the language, tensions, and opportunities of Indigenous food sovereignty is not easy and requires many more discussions. The knowledge translation around this research was critical. The food projects presented here are examples of how to create local food system elements that reflect the diverse realities of Indigenous cultures and food systems. With each and every interview, I tried to consider why what the participants were sharing with me was important. Having the opportunity to undertake conversations around the complexities and connections between land, food, culture, justice, education, healing, and well-being to further my own growth as an Indigenous person is a privilege not lost on me. At the same time, my identity as an Indigenous person on her own journey toward food sovereignty helped me relate to the information shared with me in a more intuitive way.

I realized that missing in the quest to describe the mechanics of Indigenous food systems was how food sovereignty fit into a larger social, cultural, and political narrative (Alfred, 2009; Coté, 2016; Morrison, 2011). It is missing because of the systemic damages that have occurred and continue to occur through large-scale resource extraction, racism (including environmental racism), and the loss of Indigenous women and girls, to name but a few major challenges. These are issues Indigenous peoples are facing daily. Indigenous food programs, policies, practices, and initiatives must not be considered in isolation, with fisheries siloed from forestry, from tribal government and health, and so on and so on. Food, for Indigenous cultures, doesn't exist in isolation from other parts of life and being. There is an incredible opportunity to create stronger and healthier relationships with food and the land through our connections. Indigenous food sovereignty is a historical and lived experience that, in many cases, has been dismantled by colonialism. It has been examined as a response to food insecurity, and yet it is so much more powerful. We are at a moment in time, following along the footsteps of the Idle No More movement, where politicizing the term "Indigenous food sovereignty" to resist the structures created by colonialism may just be what is needed for a resurgence in culture (Mullinix, 2015). But make no mistake; this is not only a "cultural resurgence," but also a political one (Simpson, 2017).

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The Indigenous Food Circle: Reconciliation and resurgence through food in Northwestern Ontario

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Abstract

Food policy councils provide a forum to address food systems issues and a platform for coordinated action among multisectoral stakeholders. While diverse in structure, most councils aim to develop democratic and inclusive processes to evaluate, influence, and establish integrated policy and programs for healthy, equitable, and sustainable food systems. The Thunder Bay and Area Food Strategy (TBAFS) is one such example that promotes regional food self-reliance, healthy environments, and thriving economies through the

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Disclosures

The three authors have been involved with the development, ongoing governance, and research with the Indigenous Food Circle. Charles Levkoe and Lana Ray received research funding to support the development of the Indigenous Food Circle, and Jessica Mclaughlin worked as a paid co-coordinator for eight months leading up to the completion of this paper. These relationships are all discussed explicitly in the text of the essay.

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implementation of research, planning, policy, and program development. Despite its success, the TBAFS had no formal engagement from the Indigenous communities that make up almost 13% of Thunder Bay's population (the highest urban Indigenous population in Canada). Recognizing this gap, in 2016, members of the TBAFS began to develop partnerships with regional Indigenous leaders and organizations to better understand the barriers and opportunities to engagement. The result was the establishment of the Indigenous Food Circle, which aimed to reduce Indigenous food insecurity, increase food self-determination, and establish meaningful relationships with the settler population through food. In this paper, we trace the history of the Indigenous Food Circle. Drawing on theories of decolonization and Indigenous food sovereignty, we argue that the Indigenous Food Circle requires more than simply goodwill from TBAFS members and other allied organizations. It demands confronting our histories and engaging in action that transforms current patterns of relations. It means embracing the discomfort that comes with recognizing the prevalence of settler colonialism and developing respectful and just relationships followed by action. We conclude with some suggestions for continuing this work and the opportunity to experiment with food as a tool for reconciliation and resurgence.

Keywords
Food Policy Council, Food Security, Food Sovereignty, Fort William First Nation, Indigenous Food Circle, Robinson Superior Treaty 1850, Self-Determination, Social Justice, Thunder Bay

> *We believe that traditional knowledge, as well as addressing the social determinants of health, should be at the heart of food policies and practices of governments. Indigenous peoples in different areas have sustained themselves on the wildlife and plants that their areas have produced. Various forms of agriculture have been practiced by Indigenous peoples in order to sustain the soil and land. This knowledge has been used by Indigenous peoples and in many cases shared with their non-native brothers and sisters. The uses of plants and animals as medicines and foods were common among Indigenous peoples. This unique knowledge belonging to Indigenous peoples has also assisted the Canadian people to live on the land and to prosper.*
>
> —Excerpt from Food Secure Canada's People's Food Policy (2011, p. 6)

Introduction

The food we eat provides nourishment for our bodies and our minds. More than just fuel, food is a part of our identities and cultures, and connects us to the natural world. When thinking about food, it is imperative that we also consider the social, political, economic, and spiritual contexts of land within our communities at multiple and intersecting scales. For example, issues of power surrounding land access, ownership, and rights directly impact food security and food sovereignty. The idea of a food system describes these relationships that bring food to our plates—from harvesting, foraging, and growing food to processing, distribution, consumption, and waste. Building on existing food systems definitions that offer broader explanations (see for example Ericksen, 2008), the Pan-Canadian Indigenous Food Systems Network (n.d.) describes food systems as:

> The vast myriad of rivers, watersheds, landforms, vegetation and climatic zones [that] have worked together for thousands of years to shape and form Indigenous land and food systems. Consisting of a multitude of natural communities, Indigenous food systems include all of the land, air, water, soil and culturally important plant, animal, and fungi species that have sustained Indigenous peoples over thousands of years (p. 3).

In Canada, settler colonialism has worked acutely and systematically to disrupt and alter Indigenous peoples' relationships with land in an effort to secure and maintain resources, power, and control (Ray et al., 2019). Thus, it is impossible to engage in food systems praxis without acknowledging the historical and ongoing theft of land, broken treaties, and anti-Indigenous racism (Kepkiewicz et al., 2015). Since the arrival of European settlers to what is now referred to as North America in the

16th century, Indigenous peoples have been violently removed from their lands, displaced from their food systems, and forced to assimilate into the dominant settler colonial culture. This includes being forced off traditional territories onto reservations and losing cultural and intergenerational knowledge through the residential school system, which was run by the government in partnership with Christian churches and their missionary societies (Milloy, 1999; Ray et al., 2019). The diverse Indigenous traditions around food have been treated with contempt by settler governments and viewed as detrimental to colonial notions of progress and development.

Settler colonialism continues to deny Indigenous people's access to Traditional territories as a deliberate attempt at erasure of Indigenous identity, culture, and sovereignty (Daschuk, 2013; Manuel & Derrickson, 2015). According to Wawakapewin First Nation Elder Simon Frogg, "As a result of these treaty relations, Aboriginal peoples have been taken advantage of and have not been given what the government promised them. This has led to us losing our way of life and our land" (quoted in Robidoux, Leblanc, & Mason, 2017, p. XV). Yet, remarkably, after more than 500 years of settler colonialism, Indigenous peoples remain actively engaged in efforts to protect and revitalize land and waters and to restore Traditional food systems, including cultivation, fishing, hunting, and foraging (Morrison, 2011; Rudolph & McLachlan, 2013).

While there are opportunities for Indigenous movements to work more closely with existing collaborative food networks on projects related to protecting and revitalizing land and food systems, critics have argued that settler food movements must fundamentally alter the dominant perceptions of food activism (Levkoe, 2011). Particularly, they must critically interrogate oppressive structures that include capitalism, patriarchy, white supremacy, and colonialism (Kepkiewicz et al., 2015) and learn from Indigenous food sovereignty efforts (Grey & Patel, 2015; Martens, Cidro, Hart, & McLachlan, 2015; Matties, 2016) that are rooted in a range of different social and ecological contexts. According to Food Secure Canada (2011) that guided the Pan-Canadian People's Food Policy[1] in 2011,

> As a result of harmony in our food systems, Indigenous peoples exemplified food sovereignty. Thus, the current efforts within the rapidly expanding Indigenous food sovereignty movement to restore and enhance access to traditional Indigenous foods in the forests, fields and waterways continue to be linked to the historic claims to the hunting, fishing and gathering grounds in their respective traditional territories. . . . the trends occurring amongst Indigenous peoples are the beginnings of a new Indigenous food sovereignty. By establishing their own projects under their own leadership, Indigenous peoples are determining what should be grown, cooked, taught, and shared. In time, these decisions will pave the way for greater food security. (p. 4)

While the field of sustainable food systems studies has expanded dramatically over the past decade, there remains a major gap in research and practice surrounding Indigenous food sovereignty in the context of Indigenous and settler relations, especially within an urban Canadian context. Whereas the vast majority of literature is concentrated on Indigenous peoples' responsibilities and roles in Indigenous food sovereignty, this paper emphasizes a model of interrelational responsibilities among Indigenous peoples and settlers. This is a necessary lens, considering the ongoing impacts of interference and measures of control imposed on Indigenous peoples by settler cultures and governments.

In this paper, we focus on the establishment of the Indigenous Food Circle and its efforts to address issues of sustainable food systems, social justice, and Indigenous food sovereignty in the Thunder Bay area. The city of Thunder Bay is

[1] The People's Food Policy was Canada's first and (to date) only collaborative and comprehensive food policy; it was developed between 2008 and 2011. This Pan-Canadian initiative mobilized over 3,500 people through a grassroots initiative to develop a food sovereignty policy platform and vision for the food sovereignty movement (see Levkoe & Sheedy, 2019).

located on the Traditional lands of Fort William First Nation, signatory to the Robinson Superior Treaty of 1850. The Indigenous Food Circle's evolution is rooted in principles of food sovereignty and the success and limits of the Thunder Bay and Area Food Strategy's (TBAFS) engagement with Indigenous peoples. The TBAFS is a regional food policy council that aims to address food systems issues and acts as a platform for coordinated action among multisectoral stakeholders. Established in 2008, its goal is to promote regional food self-reliance, healthy environments, and thriving economies through the implementation of research, planning, policy, and program development. Despite its success, the TBAFS had no formal engagement from Indigenous communities in Thunder Bay, a city with the highest urban Indigenous population in Canada. Recognizing this gap, in 2016 a partnership between TBAFS members and regional Indigenous leaders and organizations led to the establishment of the Indigenous Food Circle. Initially, this was an attempt to better understand the barriers and opportunities to engagement, but it has led to a more comprehensive effort to enhance Indigenous food sovereignty across Northwestern Ontario. The relationships and work conducted through the Indigenous Food Circle emphasized and encouraged a means of shared responsibility; however, this is just the beginning, and far more work is required for food sovereignty to become a reality.

The objectives of this paper are to recount the establishment of the Indigenous Food Circle in relation to some of the broader scholarship and experiences of decolonization and Indigenous food sovereignty in Northwestern Ontario. It is our intention to celebrate its successes, but also identify some of the tensions that arose among the membership and with the broader community. We write this paper as three individuals who played a leadership role in the development of the Indigenous Food Circle. Charles Levkoe is a settler raised in Southern Ontario, a scholar-activist deeply engaged in community-based action research, social justice, and food sovereignty work; he is an executive member of the TBAFS. Lana Ray is an Anishinaabe scholar and activist from Opwaaganasiniing whose ongoing work is rooted in resurgent and decolonial praxis. Jessica Mclaughlin is an Anishinaabe community developer from Long Lake 58 First Nation and is an executive member of the TBAFS. Jessica also worked as a coordinator of the Indigenous Food Circle. The integrative methodological approach to writing this paper combines both Indigenous and western ways of knowing (see, for example, Martin, 2012). Our collective reflections are based on our own experiences working with the TBAFS and the Indigenous Food Circle as well as our ongoing engagement with Indigenous-led and Indigenous-serving organizations in the Thunder Bay area and beyond. The insights in this paper also draw on group discussions at quarterly Indigenous Food Circle meetings, along with a series of unstructured interviews with representatives from the member organizations about their visions for the emerging alliance. In addition, we draw from our ongoing research and engagement on issues of settler colonialism, sustainability, social and ecological justice, and food sovereignty.

Indigenous and Settler Relations in the Thunder Bay Area: Treaty-Making, Settler Colonialism, and Racism

As stated in the introduction, any discussions of food systems in Canada must consider issues of settler colonialism and the political and economic relationships with the land and water. Thunder Bay is located in Northwestern Ontario on the Traditional Territory of the Anishinaabe peoples of Fort William First Nation (see Figure 1). Through the Robinson Superior Treaty (1850), the British secured lands for settlement and development in excess of 40,000 square kilometers (15,444 square miles) (Sinclair, 2018). In exchange, the treaty guaranteed reserve lands, hunting and fishing rights, and annuities for the Anishinaabe people.

Treaty agreements have not been upheld on the part of the British and their subjects (Sinclair, 2018, p. 4), and settler occupation in and around Thunder Bay has had a direct impact on Anishinaabe food sovereignty. Occupation, enclosure, and use of Traditional territory, as well as the imposition of regulation by settler governments, have limited and denigrated hunting, trapping, and fishing grounds (Fort William First Nation [FWFN],

Figure 1. Fort William First Nation Traditional Territory

Source: Fort William First Nations.

2019). Vast amounts of reserve lands that were created under the provisions of the Robinson-Superior Treaty have been expropriated for use by industry and the state. The expropriation of lands has been traumatic for the people of Fort William First Nation (McNeilly, 2018), who have been displaced from their homes and all arable lands (Sinclair, 2018; FWFN, 2019).

Prior to the land expropriation, members of Fort William First Nation were quite successful in their agricultural endeavors, including raising cattle, growing vegetables, and harvesting berries. For example, members won prizes at the Port Arthur Agricultural fair, and by 1900, 40 farmsteads that comprised over 600 acres (243 hectares) of cleared land could be found along the banks of the Kaministiquia River (FWFN, 2019). In 1859, farmland in what is now referred to as Neebing Township was surrendered to the Crown for future use, and in 1905 Fort William First Nation was subject to the single largest land expropriation by a railway in Canadian history (FWFN, 2019). At this time, a more than 1,600-acre (648-hectare) land surrender was imposed so that the Grand Trunk Pacific Railway could build a terminus for grain (FWFN, 2019; McNeilly, 2018). This infrastructure was never fully built, and less than 10 years later, the lands were used by settler farmers for cattle grazing (FWFN, 2019).

Despite systematic efforts to unsettle Anishinaabe peoples from Thunder Bay and the surrounding area, approximately a thousand members of Fort William First Nation live on-reserve. The city of Thunder Bay now has the highest percentage of urban Indigenous residents in Canada, about 13% of the population according to Statistics Canada (2017a). Moreover, as a regional hub, many Indigenous peoples traveling from reserves around Northwestern Ontario stay in the city temporarily to visit family and friends, seek employment, attend school and/or post-secondary institutions, and access health and social services. Many of these individuals are from First Nations communities with a similar history of land dispossession and broken treaty agreements, who face deep anti-Indigenous racism.

While Indigenous peoples' presence is indicative of their resilience, the persistence of settler colonialism has greatly affected communities that experience racism, high rates of poverty, poor health, lack of education, and limited access to

public services (Council of Canadian Academics, 2014; Power, 2008). Elsheikh (2016) notes that addressing issues of justice, including income, employment, and the unjust treatment of racialized people by government institutions, is a necessary precursor to building more sustainable and equitable food systems. For example, while direct links between poverty and food sovereignty may be more readily apparent, Pellow (2016) urges environmental justice researchers and practitioners to acknowledge the existence of connections between environmental justice and police violence. He explains that it is rare to find the existence of circumstances to address injustices when populations are marked for erasure and death.

In Thunder Bay, over half the Indigenous population lives below the Low-Income Measure, compared to only 9% of non-Indigenous residents (Lakehead Social Planning Council, 2018). Indigenous peoples in Thunder Bay are also less likely to complete post-secondary education and are more likely to have higher unemployment rates in comparison to the settler population (McNeilly, 2018), with Indigenous unemployment rates at approximately 20% (City of Thunder Bay, 2015). With inequities such as poverty as a primary contributing factor to food access (Howard & Edge, 2013), food insecurity levels are highest among Indigenous peoples in Thunder Bay and the surrounding area. This is consistent with Canada as a whole, as Indigenous peoples are much more likely to be food-insecure than the settler population, with over 20% of off-reserve Indigenous households experiencing food insecurity (Howard & Edge, 2013).

Indigenous peoples in Thunder Bay also experience direct and systemic racism on a daily basis (Sinclair, 2018). Many Indigenous peoples in the city have experienced intimidation and violence, including racist remarks, threats, physical assault, and even death. For example, the city of Thunder Bay has among the highest homicide rates (5.80 homicides per 100,000 population) and hate crime rates (140.7 on the Violent Crime Severity Index) in the country (Statistics Canada, 2017b). The Grassroots Committee on Native Unsolved Murders, formed in the 1990s, identified more than 30 suspicious deaths of Indigenous people where thorough investigations were not conducted (McNeilly, 2018). Decades later, the same issues persist. In 2015/16, a Coroner's Inquest into the deaths of seven First Nations youths who died under suspicious circumstances in Thunder Bay was held, and in 2016, a complaint was filed with the Office of the Independent Police Review Director (OIPRD) regarding the 2015 death of Stacy DeBungee, an Indigenous man. In the complaint, community members and leaders alleged that "police devalued Indigenous lives, reflected differential treatment, and were based on racist attitudes and stereotypical preconceptions about Indigenous people" (McNeilly, 2018, p. 5).

In December 2018, the OIPRD's report, *Broken Trust: Indigenous People and the Thunder Bay Police Service,* concluded that systemic racism does exist within the Thunder Bay Police force at an institutional level (McNeilly, 2018). In the same week, Senator Murray Sinclair, the lead investigator into the Ontario Civilian Police Commission's investigation of the Thunder Bay Police Services Board (a civilian oversight board for the police force) made a similar observation. Senator Sinclair concluded that "the evidence is overwhelming that Indigenous peoples in Thunder Bay have been subject to differential policing standards for decades" and that "the Police Service Board has failed to serve the Indigenous community in Thunder Bay" (Sinclair, 2018, p. 73). These reports confirmed what many Indigenous people in Thunder Bay had been saying for some time— that policing in the city is steeped in systemic racism that has served to maintain the settler colonial system. This context serves as a reminder of the realities that shape food systems, along with the realities of pursuing Indigenous food sovereignty in Thunder Bay and Canada more broadly.

The Thunder Bay and Area Food Strategy

The dominant approaches to bringing food to people have focused on increasing profit through processes of neoliberalization (Penchlaner & Otero, 2010; Lawrence et al., 2013) and productivism (Rosin, 2013). These highly concentrated and technocratic processes have been widely criticized as contributing to the seemingly intractable challenges concerning health and wellbeing, ecosystem integrity, waste and pollution, and poverty (Frison,

2016; IAASTD, 2009; Lang & Heasman, 2015). Current settler colonial policy frameworks in the global north, with few exceptions, consider these as collateral problems and respond to them through fragmented approaches that treat symptoms rather than analyzing and responding to structural issues (Dowler & O'Connor, 2012; MacRae, 2011; Rideout, Riches, Ostry, Buckingham, & MacRae, 2007). For example, the problem of hunger is often addressed as a result of scarcity as opposed to a problem of inequity. Research has demonstrated that food insecurity is directly related to income—as a household's income declines, the risk of food insecurity increases (Dachner & Tarasuk, 2018). Top-down policy approaches tend to overlook on-the-ground realities and ignore the needs and priorities of people and communities in favor of economic gain for corporations. This has led to a legitimacy crisis: the widespread public distrust of the ability of governments and industry to resolve these interconnected challenges (Renting, Schermer, & Rossi, 2012).

In response to these discontents, researchers, civil society organizations, and social movements have mobilized at multiple scales to develop viable solutions to transform food systems (Holt-Giménez & Shattuck, 2011; Levkoe, 2014). Instead of treating the symptoms and addressing issues in isolation, there has been widespread interest in addressing food as an interconnected system and as a basic human right. The food sovereignty movement has galvanized these ideals and mobilized people from across the globe toward the right of all people to "healthy and culturally appropriate food produced through ecologically sound and sustainable methods" (Declaration of Nyéléni, 2007). Moving beyond isolated food-related issues, food sovereignty is rooted in peasant and Indigenous ideals and uses a systems lens to advocate for communities to have self-determination and for those that produce, harvest, and consume food to reclaim power and control within their food systems (Jarosz, 2014; Patel, 2009).

A prominent approach to finding solutions to the systemic social, ecological, and economic problems in the food system has come in the form of food policy councils that aim to provide a forum to address food systems issues and a platform for coordinated action among multisectoral stakeholders (Blay-Palmer, 2009; Harper, Alkin, Shattuck, Holt-Giménez, & Lambrick, 2009; Scherb, 2012). Food policy councils focus on public engagement in policy-making processes, often emphasizing opportunities for more participatory forms of democracy and engagement (Koc, McRae, Desjardins, & Roberts, 2008) along with meaningful participation (Barling, Lang, & Caraher, 2002; MacRae, 2011). As an approach to food policy development, these processes are rooted in systems thinking, which recognizes the interconnections between environmental, social, and economic factors and a whole-of-government approach that has been termed a "joined-up food policy" (Lang, 2009). While diverse in structure, most food policy councils aim to evaluate, influence, and establish integrated policy and programs for healthy, equitable, and sustainable food systems for the local municipality or region they are representing.

Despite the success and expansion of food policy councils across North America and the message of inclusivity, Kepkiewicz et al. (2015) caution that the uncritical acceptance of inclusive processes they assert can "re-inscribe privilege rather than redress the inequities that characterize the contemporary food system" (p100). They go on to suggest that "when activists (and, in particular, white, middle-class, settler activists) talk about including diverse groups, they can reinforce preconceived notions of who 'needs help' and who are the helpers" (p. 100). The implication here is that beyond just talking about inclusivity, food policy councils must move past a simple inclusion of marginalized groups and approach their work within decolonial and anti-oppressive frameworks (Curran & González, 2011). For example, the main objective of the Detroit Food Policy Council has been to address racial and economic disparities throughout the food system, including combatting structural racism (Harper et al., 2009).

The TBAFS is a food policy council that promotes regional food self-reliance, healthy environments, and thriving economies through the implementation of research, planning, policy, and program development (TBAFS, n.d.-a). Following extensive public consultations and ongoing collaboration, a food charter was developed in 2008

identifying a common vision, and in 2014 a strategic action plan was endorsed by seven municipalities in the Thunder Bay area. The TBAFS is organized around seven pillars identified and selected at a Community Food Summit held in March 2013: (1) food access, (2) forest and freshwater foods, (3) food infrastructure, (4) food procurement, (5) food production, (6) school food environments, and (7) urban agriculture (TBAFS, n.d.-b). Today, the TBAFS is an active and vibrant initiative, made up of over 40 organizational representatives, 10 executive council members, and seven regional municipalities.

TBAFS members include representatives from the Thunder Bay and rural municipal councils, public institutions, academics, farmers, local business, and nonprofit organizations. The council members are conveners and activators who collaboratively implement the priorities of the Thunder Bay Food Charter to develop and monitor a healthy, equitable, and sustainable food system. The food charter presents a vision of the values, principles, and priorities of regional food systems and has been endorsed by the city of Thunder Bay and local governments, businesses, and organizations. For example, the food access pillar calls for all community members to have regular access to adequate, affordable, nutritious, safe, and culturally appropriate food in a dignified way. The forest and freshwater foods pillar acknowledges the kinds of foods available in the Thunder Bay area and their connection to ecological sustainability, economic opportunities, and peoples' cultures and identity. The TBAFS executive undertakes the coordination and support of pertinent research and events to promote the mission and address gaps in the current food system. Recent examples include a partnership with the city to increase local food procurement through a food and agriculture market study to determine local food demand. The TBAFS is also largely involved in influencing food-related policy by building relationships between people and organizations at local and regional levels.

Despite being a highly active and engaged food policy council, the TBAFS had no formal engagement with Indigenous peoples or First Nations. Recognizing this, and being in a place to reflect on the next stages of its work, the TBAFS decided to ensure that at least one executive position would be held by an Indigenous representative. While this decision was a valuable step, it became abundantly clear that one individual could not represent the wealth of history and culture, and the needs of the diverse Indigenous communities in the region. With a unique opportunity to explore food as a tool for reconciliation and resurgence, the TBAFS came to understand the engagement gap and that Indigenous perspectives were an essential element in the future of Thunder Bay's food system. However, a meaningful partnership needed to be built on respect for Indigenous peoples' self-determination and significant efforts to strengthen the strained Indigenous-settler relations in the city, the region, and beyond.

Taking direction from its membership, the executive of the TBAFS began to focus more directly on developing partnerships with Indigenous leaders and organizations to better understand the needs of Indigenous peoples along with their perceived barriers and opportunities to engagement. The manifestation of these efforts was enthusiastic support for the development of the Indigenous Food Circle. Facilitated by Jessica and Charles, both TBAFS executive members, the process involved reaching out to Indigenous-led and Indigenous-serving organizations in the Thunder Bay area that were engaged in food systems efforts. This meant working with existing partners, drawing on personal contacts, and identifying new organizations to approach as a way to build relationships based on mutual respect and trust. The process began with a series of one-on-one conversations with organizational representatives to assess interest in the initiative, as well as a series of meetings of the larger group to establish a basis for cooperation. While some of these conversations took a more formal tone, others were deliberately unstructured and occurred over tea or a walk through the woods. This research was intentionally approached through taking leadership from those directly involved in and with Indigenous food systems. The result was the establishment of the Indigenous Food Circle that aimed to reduce Indigenous food insecurity, increase food self-determination, and establish a space to further explore the intersections of Indigenous and settler

relationships and responsibilities as they relate to land and food.

The Emerging Indigenous Food Circle: Food Policy Councils, Indigenous Peoples, Reconciliation and Resurgence

The exploratory phase that preceded the establishment of the Indigenous Food Circle involved reaching out to Indigenous organizations with support from other members of the TBAFS executive, community members, and Lakehead university faculty and students. To support these efforts, the group applied for a small grant from the Social Science and Humanities Research Council of Canada (SSHRC) that provided support for collaborative research activities to inform decision-making. SSHRC's Partnership Engage grants are intended to address organizational needs and challenges and to "let non-academic organizations and postsecondary researchers access each other's unique knowledge, expertise and capabilities on topics of mutual interest" (SSHRC, n.d., p. 2).

Successfully receiving the grant enabled a continued exploration into the kinds of activities being undertaken by Indigenous organizations involved in food systems initiatives in the Thunder Bay area and how the TBAFS could better engage with these initiatives and build partnerships that were relevant to Indigenous peoples. The initial phase of the Indigenous Food Circle's development involved reaching out to Indigenous-led organizations already administering or developing food-related programs and initiatives along with other organizations that supported Indigenous peoples. The work privileged knowledge exchange activities that were both personal and meaningful, but that were notably different from the meetings and engagement sessions that established the TBAFS. For example, engagement included a series of ongoing, participatory conversations led by Indigenous people to establish trust-based relationships. All the initial meetings were focused on building relationships rather than strictly on gathering information. At their core, these efforts were premised on the idea that building sustainable food systems in the Thunder Bay area should be rooted in social justice and that Indigenous peoples be positioned to take leadership roles. Some organizations scheduled follow-up meetings to include other employees in the conversations to discuss food work that the particular organization was administering. These efforts employed an Indigenous research and pedagogical practice through a process of learning while doing, allowing for knowledge to freely emerge in an ethical process of embodied and relational knowledge co-production (Chilisa, 2011; Ray, 2012).

A summary of the information gathered was presented back to participants through one-on-one meetings and at a meeting of the Indigenous Food Circle to determine next steps. The results were also presented through a series of articles in the TBAFS newsletter and publications of member organizations, a final report, conference presentations, and a series of public events. From this exploratory research, participants determined that the primary aims of the Indigenous Food Circle should be to reduce Indigenous food insecurity, increase food self-determination, and establish meaningful relationships with the settler population through food. To do this, the group aspired to understand better the issues that affect Indigenous-settler relations and Indigenous peoples' food-related needs. The Indigenous Food Circle was given the mandate to establish a collaborative platform to support food-related initiatives developed by and for Indigenous organizations in the Thunder Bay area. Further, the following six objectives were adopted by the group:

1. To build meaningful relationships among Indigenous-led food organizations in the Thunder Bay area;
2. To support, connect, and coordinate members with food-related initiatives and opportunities;
3. To establish a space for Indigenous people to share information and develop solutions to address immediate needs and decolonize the food system;
4. To increase awareness of Indigenous organizations and the food-related work they are involved with;
5. To build relationships between Indigenous-led and settler-led organizations; and,

6. To support effective Indigenous engagement and decolonization work in the city of Thunder Bay and the surrounding area.

At the time of this writing, representatives from 22 organizations have committed to participate in the Indigenous Food Circle. In addition, 40 meetings were held with other Indigenous and/or supporting organizations that have expressed interest but need a clearer mandate before proceeding with full commitment. In 2018, the Indigenous Food Circle and the TBAFS co-developed a number of small pilot projects that aimed to support member organizations. For example, in 2017 and 2018, the Thunder Bay Country Market and the Indigenous Food Circle hosted members of the Anishnawbe Mushkiki Healthy Eating Active Living program for a cooking, learning, and sharing workshop to build familiarity with locally grown and harvested foods and the means of obtaining them. In 2018 and 2019, the Indigenous Food Circle supported a large-scale project in partnership with the Thunder Bay District Health Unit and Lakehead University to develop and implement food sovereignty visions for 14 First Nations in the Thunder Bay area (see Levkoe, McLaughlin, Strutt, & Ng, 2019).

The initial research concluded that to build healthy, equitable, and sustainable food systems in the Thunder Bay area, it is essential to respect and make space for the leadership of Indigenous voices. Drawing on concepts of food sovereignty and emphasizing a re-connection to land-based food and political systems, the Indigenous Food Circle must continue to create space for Indigenous peoples to enact their own knowledge systems. Further, it was tasked with supporting and developing the capacity of Indigenous-led organizations to articulate and respond to relevant challenges and opportunities and to improve programming and policy in ways that assert Indigenous self-determination.

While there have been many reasons to celebrate, the journey to establish the Indigenous Food Circle has been complicated. The initial conversations with members of the TBAFS about the lack of Indigenous engagement were difficult and at times caused great discomfort among some members. Confronting issues of anti-Indigenous racism and acknowledging the impacts of settler colonialism take time and require great sensitivity, especially since a primary goal of the Indigenous Food Circle is to disrupt oppressive relationships between Indigenous and settler peoples in the Thunder Bay area, as well as recognizing and working to advance interrelated responsibilities. Moving through these conversations has involved a series of focused discussions along with targeted anti-racism and anti-oppression trainings held for the TBAFS executive and member organizations. Another major challenge involved the lack of resources and time to conduct the research and work required to build trusting and meaningful relationships. Every individual and organization involved has indicated that they are overworked and many are participating "off the side of their desks." Finding additional supports and resources will be essential for further engagement. A third and related challenge has been that many of the Indigenous-led and Indigenous-serving organizations involved in the Indigenous Food Circle work with populations facing extremely high levels of historical and ongoing trauma and could barely keep up with addressing immediate needs. For some, understanding the prospects that food sovereignty had to offer was well beyond their capacity. In many cases, it was junior staff who attended meetings and contributed to the Indigenous Food Circle, indicating that more work needs to be done to engage upper-level management and organizational directors. Finally, while all participants agreed that the Indigenous Food Circle was much needed and had a vital role to play in the Thunder Bay area, there was, and remains, uncertainty and disagreement as to what should be the primary focus of the collective work. For example, there has been some tension around whether future efforts should focus on addressing immediate, short-term needs, or considering longer-term, policy-level change. Also, some priority issues identified by members (such as access to wild game and other Traditional foods) have been contentious and require further research and careful negotiation with municipal and regulatory bodies. Many of the challenges identified here are ongoing and will be part of the processes of collaborative dialogue

within the Indigenous Food Circle.

Since the initiative began, the Indigenous Food Circle has already generated great interest, particularly for those engaged in food systems research and practice. As a result, the group has been invited to bring an Indigenous perspective to food systems work across the Thunder Bay area and beyond. This has included processes of engagement and sharing through providing regular updates to the TBAFS executive and presentations to the TBAFS council members at the annual general meeting. In October 2017, the Indigenous Food Circle and TBAFS were invited to present at the provincial Bring Food Home Conference in Ottawa, Ontario, and in November 2018, Jessica, the coordinator, represented the Indigenous Food Circle at the 10th Food Secure Canada national assembly. These presentations focused on food sovereignty and issues surrounding reconciliation and resurgence through food in Northwestern Ontario. The Indigenous Food Circle has also taken on leadership through a number of other initiatives, including a scan of Indigenous procurement policies in partnership with the city of Thunder Bay and an initiative to build and support food sovereignty networks across Northwestern Ontario. Moving forward, it aims to facilitate more discussions around the topic of decolonization and Indigenous food sovereignty and has already partnered with the TBAFS to develop and deliver anti-racism and anti-oppression trainings in Thunder Bay. For now, the Indigenous Food Circle and the TBAFS have agreed to remain distinct. The Indigenous Food Circle has its own coordinator and is in the process of developing an independent governance structure and terms of reference rooted in Indigenous ideals of self-determination. However, both groups plan to explore co-governance mechanisms and further opportunities for mutual support in the future.

Conclusions

While there are many examples of initiatives that are creating on-the-ground change in local communities, to have an impact on the dominant food system, those involved must also work together to share experiences, successes, and challenges and collaboratively address the root causes of social inequity. Considering the ongoing strain on Indigenous-settler relationships in the Thunder Bay area, the Indigenous Food Circle presents a unique opportunity to demonstrate ways that food can be used as a tool for reconciliation and resurgence. The Indigenous Food Circle was built on the idea that Indigenous peoples should have control of their food systems and is rooted in the theory and practice of food sovereignty, emphasizing self-determination and a re-connection to land-based food systems.

While only in the beginning stages, the Indigenous Food Circle is committed to confronting colonial histories, learning from other Indigenous food sovereignty efforts, and engaging in action that transforms relationships. The aim for the next stage of work will be to provide enhanced capacity to reflect on the challenges and opportunities to improve programming and policies that embody principles of Indigenous food sovereignty. This will involve further engagement with the different Indigenous- and settler-led organizations involved in food systems initiatives in the Thunder Bay area and across Northwestern Ontario. These efforts will also involve further exploration of ways the TBAFS can learn from and participate in exchanges and partnerships with the Indigenous Food Circle. In addition, this work demands deeper engagement and education with settler organizations to further understand attempts at reconciliation and to support them in applying a decolonizing approach to servicing and working with Indigenous people in the Thunder Bay area. However, we caution that the success of the Indigenous Food Circle requires more than simply goodwill from TBAFS members and other allied organizations. It demands confronting the ongoing legacy of colonialism, land dispossession, anti-Indigenous racism, and violence in the city of Thunder Bay, and engaging in action that transforms these relations. It means embracing the discomfort that comes with recognizing the prevalence of settler colonialism and developing respectful and just relationships followed by action.

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A holistic definition of healthy traditional harvest practices for rural Indigenous communities in Interior Alaska

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Abstract

Traditional harvest practices of the harvesting and sharing of fish, wildlife, and other wild resources are an integral source of food security that support physical, mental, and spiritual wellness, education, socio-economic development, and cultural identity

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of Indigenous communities in Interior Alaska. Many significant changes, including climate change, are impacting this way of life and challenging secure access to foods vital for sustenance and cultural preservation. We use a case study approach to develop a holistic and place-based definition of traditional harvest practices of Indigenous communities in rural Interior Alaska that expands upon commonly accepted definitions of food security. This definition emphasizes the role of ecological health, culture, and decision-making power in strengthening food security and sovereignty. We also highlight how multistakeholer partnerships foster capacity building that can support communities in their efforts to advocate for food security and sovereignty.

Keywords
Indigenous Food Systems, Wild Foods, Interior Alaska, Traditional Livelihoods, Food Security, Food Sovereignty, Climate Change

Introduction

Changing Food Systems

The interwoven relationships between ecological systems, livelihoods, culture, well-being, and wild foods of Indigenous communities in the Arctic are well-documented (Duhaime, 2002; Inuit Circumpolar Council-Alaska [ICC], 2015; Loring & Gerlach, 2009; Zagoskin, 1967). These communities have survived for millennia in a harsh climate through their attunement to the landscape and to the fish, game, and other wild resources on which they relied (Kawagley, 2006; Krupnik, 1993). This deep relationship with the land supported cultural stability that gave rise to distinct cultures related to place (Berkes, 2012). At one time, Arctic Indigenous communities had food sovereignty and traditional trade practices were common. In Alaska, forces of social and economic change, beginning with the Russian fur trade in the mid-1800s and accelerating with the discovery of gold in the late 1800s and early 1900s, dramatically changed the food systems, livelihoods, and social and governance structures of Indigenous communities (Foote, 1965). Economic change came in many forms that partially replaced long-standing barter and trade systems with a cash economy. An influx of gold seekers and settlers brought new forms of commerce. In some cases, this aided harvest activities through the introduction of new technologies such as fish wheels, prop motors, and rifles. However, these new technologies and the influx of people also increased competition for, and overharvesting of, wild resources (Loyens, 1966). Foreign populations brought epidemics that decimated Indigenous populations in Alaska. The most devastating wave of sickness occurred in 1900. Indigenous communities throughout western, interior, and northern Alaska lost an estimated 25 to 50 percent of their members within a single year (Wolfe, 1982), and many surviving children were sent to newly constructed boarding schools (Loyens, 1966). In addition to displacement of youth caused by epidemics, around the turn of the century the United States adopted policies that removed Indigenous youth from their communities and sent them to boarding schools with the expressed intention of assimilating them into Euro-American culture and severing connections to their homelands and traditions, including traditional food (Coté, 2016). These policies have had lasting impacts among Indigenous communities in Alaska.

New forms of governance were institutionalized after Alaska statehood was ratified in 1959. The passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971 extinguished aboriginal hunting and fishing rights (ANCSA, 1971). The passage of the Alaska National Interests Land Conservation Act (ANILCA) in 1980 did little to restore the strong Indigenous relationship with the land and tradition of stewardship because it failed to protect access to wild foods based on ethnicity (ANILCA, 1980; Wheeler & Thornton, 2005). Today, competing state and federal jurisdictions related to the management of wild resources have given rise to a complicated dual management system that challenges the food security of Indigenous communities. For example, preferential harvest is granted to rural communities on federal land, but not on state land. Often communities are surrounded by a patchwork of state and federal lands that have different rules for resource management and harvest of wild resources (Ristroph, 2018; Wheeler & Thornton, 2005).

Climate Change Presents New Challenges

In addition to economic, social, and political change, accelerating environmental changes associated with climate warming add a layer of complexity and vulnerability to the harvesting of wild foods (Brinkman, Hansen, Chapin, Kofinas, BurnSilver, & Rupp, 2016). Climate assessments have shown warming in the Arctic that is about twice the global average (Chapin et al., 2014, Comiso & Hall, 2014). Indigenous communities experience impacts from this warming in a number of ways. For example, frozen rivers are important travel corridors for hunting, trapping, and wood harvesting. Warmer winters have led to later freeze-up and earlier break-up of rivers in addition to longer time that rivers are unsafe to travel on, thus inhibiting access to harvest resources (Brown, Brinkman, Verbyla, Brown, Cold, & Hollingsworth, 2018). These changes influence not only human movement but also the migration of wildlife, such as caribou, on which communities rely (Leblond, St-Laurent, & Côté, 2016).

In the past, reliable environmental cues such as the timing of the seasons and consistency in fish, bird, and wildlife migration supported cultural stability. Flexibility and innovation within the social and governance structures of Indigenous communities supported a robust knowledge system—hereafter referred to as Traditional Ecological Knowledge (TEK)—that strengthened capacity to adapt to significant environmental variability (Barnhardt & Kawagley, 2005; Pearce, Ford, Wilcox, & Smit, 2014). With the rate of environmental change, the landscape is becoming less familiar to the people that have always known it well, and TEK is becoming less reliable (Cochran et al., 2013; Pearce et al., 2014). For example, co-author Huntington recalls a well-known bear den located near his home community of Huslia. Knowledge of the den was passed down for generations. It was located on a thermokarst ridge, which is now the location of wetlands and dry lakes and the den no longer exists. Within one generation this past knowledge became obsolete (Huntington & Watson, 2012). While the Intergovernmental Panel on Climate Change asserts that climate change is one of the most significant challenges facing the globe in the current century (Larsen et al., 2014), Indigenous communities will disproportionately experience the impacts from climate change, due to not only their strong reliance on the environment for their livelihoods but also the legacies of colonialism that have challenged the perpetuation of their way of life (Ford et al., 2018; McNeely, 2011).

Despite these challenges, reliance on and sharing of fish, wildlife, and other harvested resources continues to be an integral source of food security and cultural identity for Indigenous Alaska communities. However, because of current challenges related to climate change, cultural disruptions, changing economic opportunity, and a complex management system, there is an increasing need for new creative forms of learning and knowledge distribution that can effectively support community-based adaptations. Community-based adaptation to climate change should be a "community-led process, based on communities' priorities, needs, knowledge, and capacities, which should empower people to plan for and cope with the impacts of climate change" (Reid, Mozaharul, Berger, Cannon, Huq, & Milligan, 2009, p. 13). Relevant community-based adaptations must consider the central role that harvest practices continue to play in supporting the livelihoods, health, wellbeing, and cultural identity of Indigenous communities.

Commonly Accepted Definitions for Food Security

Commonly accepted definitions of food security[1] largely ignore the interdependence of cultural identity, traditional knowledge systems, governance structures, and stable environmental conditions that are needed to maintain Indigenous food systems (Anderson, 1990; Food and Agriculture Organization of the United Nations [FAO], 2006). By contrast, definitions of food sovereignty

[1] The U.S. Department of Agriculture (USDA) and the Food and Agriculture Organization of the United Nations (FAO) define food secure households as "access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum: The ready availability of nutritionally adequate and safe foods [and the] assured ability to acquire acceptable foods in socially acceptable ways" (Anderson, 1990, p. 1558S).

broaden this definition by placing a greater emphasis on the right of communities and nation-states to define and protect their own food systems (Wittman & Blesh, 2017). The Declaration of Nyéléni, developed by 500 delegates from 80 countries, states that "food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agricultural systems" (Nyéléni Forum on Food Sovereignty, 2007). Discourse on Indigenous food sovereignty expands this definition by emphasizing the unique relationship Indigenous peoples have to the land and their reliance on it for foods that are both culturally and spiritually significant. Because these relationships are unique to different geographic areas and cultures, developing a definition of Indigenous food sovereignty that encompasses this diversity is problematic (Coté, 2016; Weiler, Hergesheimer, Brisbois, Wittman, Yassi, & Spiegel, 2014).

The overall goal of this research is to provide, through a case study, a holistic and place-based definition of food security and food sovereignty that supports community-based adaptations that can facilitate modification of policies that better align with the perspectives of Indigenous communities in Alaska. Our specific objective is to build on the food security framework developed by the Inuit Circumpolar Council (ICC, 2015). We show its broader relevance to Athabascan communities in Interior Alaska through the collaborative work developed through a multistakeholder group consisting of university, tribal, nonprofit, and agency partners.

The ICC exists to provide a unified voice for the Alaska Inuit and serves as a Permanent Participant in the UN Arctic Council, an intergovernmental forum created to address issues faced by Arctic governments and Indigenous Arctic communities (ICC, 2015). This is how the ICC defines Inuit food sovereignty:

> The right of Alaskan Inuit to define their own hunting, gathering, fishing, land, and water policies; the right to define what is sustainably, socially, economically, and culturally appropriate for the distribution of food and to maintain ecological health; the right to obtain and maintain practices that ensure access to tools needed to obtain, process, store, and consume traditional foods. Food sovereignty is a necessity to support and maintain the six dimensions of food security 1) Availability, 2) Inuit Culture, 3) Decision-Making Power, 4) Health and Wellness, 5) Stability, and 6) Accessibility. (ICC, 2015, p. 35)

We aim to compare this existing food security framework with the experience of rural Indigenous communities in Interior Alaska.

Methods

Multistakeholder Partnerships

In 2016, Community Research Partnerships for Sustainable Traditional Harvest Practices, hereafter referred to as (CRP), was initiated by the University of Alaska Fairbanks (UAF). The partnership focused on developing respectful research relationships between university and community partners that supported community-based adaptations in response to social, ecological, and environmental change impacting traditional harvest practices. The program was formed in collaboration with tribal groups from Interior Alaska that include the Anvik Tribal Council, Nulato Tribal Council, Koyukuk Tribal Council, Ruby Tribal Council, Venetie Tribal Council, tribal nonprofits including the Council of Athabascan Tribal Governments (CATG) and Tanana Chiefs Conference (TCC), and the Alaska Department of Fish & Game (ADF&G). Interior Alaska encompasses 11 distinct Athabascan or Dene language and cultural groups including Ahtna, Dena'ina, Deg Xinag, Holikachuk, Koyukon, Kolchan, Upper Tanana, Lower Tanana, Han, and Gwich'in (Krauss, 1982). Within this region there are 38 federally recognized tribes. Tribes within this region have representation in one or both of the tribal consortia TCC and CATG.

There is a long legacy of research relationships in the state of Alaska that have not only dismissed the knowledge, experience, and relationship of Indigenous peoples to their homelands, but also put Indigenous peoples and their homelands in

jeopardy in the name of scientific experimentation and progress (Naske & Hunt, 1978; National Research Council, Committee on Evaluation of 1950s Air Force Human Health Testing in Alaska Using Iodine-131, 1996; North Slope Borough Science Advisory Committee, 1993). Given the impact of these past experiences, establishing research relationships built on mutual respect and reciprocity was paramount in guiding the partnership design and process. It was also central for ensuring that research outcomes supported communities in their vision for food security and sovereignty and did not simply reinforce institutionalized power imbalances that undermine empowerment (Kepkiewicz et al., 2015; Loring & Gerlach, 2015). Specifically, the CRP initiative drew heavily from recommendations on best practices and codes of ethics while developing the initial plan for community-engaged research. Important references included the Alaska Native Science Commission *Code of Research Ethics* (ANSC, 1997), the National Congress of American Indians best practices guide, '*Walk softly and listen carefully': Building research relationships with tribal communities* (NCIA, 2012), and the Alaska Native Knowledge Network *Guidelines for Respecting Cultural Knowledge* (ANKN, 2000).

Building strong research partnerships that supported community-based adaptations was a guiding objective of the CRP initiative. Beginning in early 2016, CRP wrote to all tribal councils, cities, and village corporations within the TCC region that had a year-round population (*N*=38) and invited them to participate in the CRP initiative. Eight tribal councils and two village corporations returned an expression of interest. After further follow-up, one tribal council and one village corporation decided not to advance further in the partnership process. Project teams formed that consisted of various combinations of community leadership and university faculty, students, agency personnel, and the CRP coordinator. During the initial community visits, community leaders were asked to identify current challenges affecting their traditional harvest practices. These conversations informed the questions and goals behind each research partnership.

Focus areas of research partnerships determined by community and tribal-council input included a community assessment of food security and sovereignty, a traditional place-name mapping initiative, research that investigated the impacts of climate variables on moose harvest success, local versus non-local hunting competition, and the impacts of climate change on berry variability and availability. After two years, all participants and collaborators who participated in the CRP initiative came to a workshop in Fairbanks in May 2018. The purpose of the workshop was to share perspectives, challenges, and opportunities related to healthy traditional harvest practices, synthesize research findings, and to reflect as a group on how individual partnerships supported community-based adaptations. Two main techniques were used to synthesize workshop participant perspectives: a system model of contemporary perceptions of traditional harvest practices using a collaborative-network mapping activity, and a trend-mapping exercise (Parkhurst & Preskill, 2016) that recorded the positive and negative changes affecting traditional harvest practices in Interior Alaska.

Rural Interior Alaska Community-based Adaptation Workshop

A total of 34 participants representing six communities, four university departments, and four organizations or agencies attended the workshop. These included the research affiliates and community representatives heavily involved with individual research efforts. Also included were knowledgable experts in the management of hunting, fishing, and gathering activities, experienced Indigenous hunters, fishers, and gatherers, an Elder advisor, and experts in building and strengthening multistakeholder partnerships. Given the limited participation of Interior communities (*n*=6), results from this workshop should not be considered representative of the entire region although they may offer insights into areas of critical vulnerability and potential strategies for food security and food sovereignty that are more broadly relevant to the region.

Deliberate attention was given to address power imbalances related to gender, ethnicity, and education level that, if not addressed, can undermine inclusivity, legitimacy, and trust-building that are necessary practices in knowledge co-production

(Djenontin & Meadow 2018; Sbicca, 2015). They were addressed in part by emphasizing that each individual had important contributions to make through their lived experiences. Everyone, regardless of whether they were a hunter, professor, manager, or community member, was encouraged to share their unique perspective. We also utilized workshop agreements adapted from the First Alaskans Institute (FAI) that establish ground rules for interpersonal interactions that are based in Alaska Native culture and practices (FAI, 2014).

This two-and-a-half-day workshop had three major objectives: (1) to develop a common understanding around key concepts related to healthy traditional harvest practices, vulnerability, adaptive strategies, and resilience; (2) identify major changes (both positive and negative) affecting traditional harvest practices in rural Interior Alaska; and (3) identify if or how individual research efforts supported community-based adaptations.

We accomplished the first objective by identifying attributes and a system boundary of healthy traditional harvest practices among Indigenous communities in Interior Alaska based on the perceptions and experiences of workshop participants. We did this by asking each participant as soon as they arrived on Day 1 to write down three to six single words or word pairs that described what strong and healthy traditional harvest practices meant to them. These words and word pairs were then used to create a network that linked individual participants to the words and word pairs. We used the network as a visual tool to lead a discussion that elaborated what participants meant by their word selections. As similarities and themes emerged among different word uses, we grouped and clustered different parts of the original network to show the shared understanding of what participants understood as a healthy traditional harvest system. Ten thematic areas were identified and built upon in the rest of the workshop. Two additional themes were added during a following exercise. These themes were closely related to those developed by the ICC, showing the similarities between perceptions of food sovereignty and security frameworks between the Arctic and Interior regions.

Once we identified the system boundary for healthy traditional harvest practices, we used an adapted trend-mapping method to explore positive and negative changes to this system (Parkhurst & Preskill, 2016). We did this by asking workshop participants to describe five to seven key changes (both positive and negative) that they thought were influencing healthy traditional harvest practices of Indigenous communities in Interior Alaska, with an emphasis on the last 10 years. Positive impacts were those that supported, strengthened, or increased access to harvest, or were examples of adaptations to stressors. Negative impacts were those that hindered, weakened, or decreased access to harvest practices, or increased the vulnerability of harvest practices. After each participant identified changes they considered significant, they were asked to cluster the changes around the attributes of healthy traditional harvest practices that the change was most closely tied to. Responses in each cluster were further reduced by combining similar or duplicative changes, while unique changes were kept. Workshop participants performed the reduction process together to reach a consensus on cluster categories.

Highlighting the Limitations of the Findings

Methods used in this research primarily originated in western paradigms of research, and thus have limitations and weaknesses. For example, these methods do not fully recognize that Indigenous Knowledge methodologies are grounded in place, shared identity, spirituality, experience, and the utility of knowledge. Thus, using a western research paradigm, we recognize that Indigenous Knowledge cannot be adequately embodied in the form of knowledge production used here that relies heavily on rapid, written, and systematic information-gathering that is only weakly tied to longstanding experiences of place (Berkes, 2012; Cochran et al, 2013; Huntington & Watson, 2012).

Results

System Model of Modern Traditional Harvest Practices

Developing a common understanding of key concepts around healthy traditional harvest practices, vulnerability, adaptive strategies, and resilience was

an important component of the workshop process. Ten thematic areas or attributes of healthy traditional harvest practices emerged from the network mapping activity, and two additional attributes were added during the trend-mapping exercise, including the role that the cash economy and formal education system have in helping or hindering traditional harvest practices. Each cluster of word pairs was given a unique label agreed upon by the whole group. Results from the network mapping exercise are highlighted in Table 1 under the heading "Interior Alaska dimensions of healthy traditional harvest practices."

Using the trend-mapping exercise, participants

Table 1. Comparing the Inuit Circumpolar Council (ICC)'s Six Dimensions of Food Security to Components of Healthy Traditional Harvest Practices of Rural Indigenous Communities in Interior Alaska Identified in the Workshop

Availability (ICC definition): *The ability of the Arctic ecosystem to maintain a high variety of life (biodiversity), allowing adequate transfer of nutrients and energy. It is the knowledge of the seasons and how to collect, process, store, and consume traditional foods, allowing for Inuit to eat what has been gathered from the previous seasons and harvest a variety of medicines (ICC, 2015, p. 34).*	
Interior Alaska dimensions of healthy harvest practices (workshop food security concepts)	**Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska (workshop changes in food security)**
Natural Grub Box: Includes concepts of harvest abundance of fish and game, healthy ecosystem, and quality of habitat. **Full Belly**: Includes concepts of having enough, e.g., full smokehouse, winter supply, full cache, full freezer, abundance, and wealth.	More gardening and agriculture (FS) Better food storage and preservation: freezing/canning (FS) Better science: (FS) Less fish (King salmon) and game (FI) Less availability of other food resources (FI)
Accessibility: *The ability to live off the land, ocean, and air and to obtain sufficient access to a diverse source of healthy food, water, animals, plants, fish, ice, etc. The ability to maintain Inuit traditional economic practices, such as trading, sharing, and providing foods and medicines. It is the ability to access and maintain an economic system based on cash in connection to an Inuit traditional economic system. It is the ability to obtain skills, tools, and technologies needed to collect, process, and store traditional foods (ICC, 2015, p. 35)*	
Interior Alaska dimensions of healthy harvest practices	**Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska**
River Eddy and Hunting Trails: Includes concepts of good or easy access, cash needed to get out, opportunity, protection of resources, and reduced legal restrictions that limit access. **Cash economy:** Harvest activities are now interdependent with the cash economy.	Better tools: rifles, gear, boats, snow machines (FS) High fuel, energy, and equipment costs (FI) Competition from outsider hunter/ fishers (FI) Development pressures (FI) Commercial fishing & guiding (FI)
Inuit Culture: *Food is the cornerstone of our culture and self and shared identity. Harvesting traditional foods is how cultural values, skills and spirituality are learned—this is how all learn to be within their environments and to be part of the ecosystem. The relationship between Inuit and all else that makes up the Arctic environment aids in the maintenance of cultural and environmental integrity (ICC, 2015, p. 34).*	
Interior Alaska dimensions of healthy harvest practices	**Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska**
Traditional Knowledge Practices: Includes concepts of preparing, understanding, getting an early start, teaching youth, and traditional practices. **Values:** Includes concepts of spirituality, way of life, and strong culture. **Sharing:** Includes concepts of unity, interdependence, community, cooperation, and distribution.	Youth culture camps (FS) Language revitalization (FS) Cultural resurgence (FS) General sovereignty efforts (FS) More respect for others and culture (FS) Loss of Elders and their knowledge (FI) Drugs & alcohol (FI) Culture disruptions (FI) Influence of technology (FI) *(continued)*

Health and Wellness: *Physical health of all life within the Arctic and of the land, water and air; adequate passage and absorption of nutrients throughout the Arctic ecosystem; mental health related to community and household relations and self- and cultural identity; environmental integrity and productivity to withstand pollution, habitat destruction and other disturbances (ICC, 2015, p. 34).*

Interior Alaska dimensions of healthy harvest practices	Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska
Happy, Strong Families: Includes concepts of teaching children, respect, family, hard work, healthy food, generational sharing, exercise, and Elders. [Natural Grub Box]	Being together (FS) End of intergenerational trauma (FS) Less participation in fish camp (FI) Electronic technology (FI) Increased individualism (FI)

Stability: *The ability of systems to adjust to each other as shifts within the ecosystem occur. The ability to maintain sustainability through the management of human actions that support and ensure younger generations will have sufficient healthy food to harvest and that all the pieces of the puzzle maintain connections. Stability is obtained through a level of Alaskan Inuit mental security and is in reference to the legal protections for environment against harm caused by pollutants. Mental security is also in reference to legal protection against forced assimilation, which allows for the maintenance of a level of cultural confidence and hope (ICC, 2015, p. 35).*

Interior Alaska dimensions of healthy harvest practices	Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska
Environmental Conditions: Includes concepts of stability in climate, weather, and river navigability. **Formal Education System:** Improves with greater Indigenous influence.	Increased Indigenous influence in western education system (FS) Poor cultural integration that reinforced existing power structures (FI) Climate change (FI) Warmer winters (FI and FS) Chanel and water level changes (FI and FS) Riverbank erosion (FI) Permafrost thaw (FI) Unpredictable environment (FI) Pollution (FI) Fewer berries (FI)

Decision-Making Power and Management: *The Alaska Inuit ability to use and value Indigenous Knowledge (IK) to manage daily activities; to build and rely on self-governance across space and time; for Alaska Inuit to use their knowledge system in synergy with other knowledge systems such as Western science, to equitably manage human activities within the Arctic environment and to better understand changes occurring; to apply holistic knowledge to understanding the Arctic environment through IK philosophies and methodologies; the ability to manage activities within the Arctic in a way that ensures younger generations will have healthy and nutritious foods to harvest; for Alaskan Inuit to have control over their own fate and to use their cultural value system (ICC, 2015, p. 34).*

Interior Alaska dimensions of healthy harvest practices	Corresponding positive and negative changes driving food security (FS) and insecurity (FI) in Interior Alaska
Indigenous Governance: Includes concepts of stewardship, sustainability, insight, and conservation. **Western Governance:** Includes concepts of power, management, law, agency, and strategy.	Cooperation/Collaboration (FS) Co-Management structures (FS) Increased advocacy (FS) Increased capacity through Tribal Management (FS) Traditional Ecological Knowledge (TEK) accepted as a methodology (FS) Conservation efforts that protect wild food resources (FS) Decrease in state funding for management (FS and FI) Lack of involvement in process (FI) Poor dual-management (FI) Regional corporation priorities (FI) Climate denial in politics (FI)

Note: FS = food security, FI = food insecurity. All results are displayed as written by individual workshop participants.

were asked to identify the most significant positive and negative changes within the last 10 years that have affected the attributes of healthy traditional harvest practices identified during the first exercise. A total of 138 changes were generated. Of these changes, 61 were considered positive and 77 were considered negative. Changes that were identical or indicated a similar concept were grouped together and given a unique code by a subset of workshop participants. A total of 47 unique codes were identified, of which 20 were considered positive, 24 negative, and three were both positive and negative (Table 1). Positive changes corresponded to drivers of food security, while negative changes corresponded to drivers of food insecurity. Changes were grouped according to the six categories defined by the ICC as strong influences on traditional harvest system.

A Holistic Definition of Healthy Traditional Harvest Practices for Rural Indigenous Communities in Interior Alaska

Based on the discussion and content produced by CRP workshop participants, a holistic definition of food sovereignty for rural Indigenous communities in Interior Alaska began to emerge in connection with traditional harvest practices. Abundant fish, game, and wild foods provided through quality habitat and healthy ecosystems support full bellies, abundance, and wealth (*Availability*). Accessing this abundance is supported through stable environmental conditions, the cash needed to acquire the materials and supplies used to harvest wild resources, and the legal protection to hunt and fish within traditional territories (*Accessibility*). Abundance of wild foods and the continued ability to access them support the knowledge, values, and spirituality rooted in a strong culture that supports a way of life embodied through sharing, interdependence, and cooperation (*Culture*). The availability of wild foods and the traditional knowledge needed to harvest these resources effectively and appropriately support happy, strong families by supporting strong identities, physical wellness, and mental wellbeing (*Health and Wellness*). Indigenous influence on formal and informal forms of education will support future generations in acquiring the traditional knowledge and skills needed to maintain and adapt this way of life as social, economic, and environmental shifts occur (*Stability*). Indigenous governance structures that embody stewardship of the land, insight into the interconnections between people, animals, and place are paramount in the sustainability of wild foods and support self-governance and the management of wild resources (*Decision Making Power and Management*).

Similar Definitions of Food Sovereignty

Components of food sovereignty identified in the ICC food security conceptual framework include "type of management used, legal structures to support decision-making power, power dynamics, federal and state jurisdictions, equality of knowledge systems, the generation of information to inform decisions through co-production of knowledge and community-driven research" (ICC, 2015, p. 47). These components of food sovereignty have several similarities with the top 10 drivers of food security identified during the CRP workshop (Table 1), which include traditional knowledge practices, collaboration/cooperation, increased capacity in tribal management, TEK as a legitimate source of information, general sovereignty efforts, increased Indigenous influence in western systems, language revitalization, better science and Indigenous governance. Both the ICC-identified drivers of food sovereignty and those identified by the CRP workshop participants emphasize the need for changes in power dynamics and more Indigenous involvement in the decision-making processes that govern traditional and wild foods.

Research and Partnerships that Strengthen Food Security and Sovereignty

A substantive portion of the workshop focused on sharing results and reflections on research partnerships that had been developed over the previous two years. Workshop participants were asked to reflect on ways that individual partnerships strengthened drivers of food security or worked toward addressing drivers of food insecurity according to the definitions that were created together. Common themes that arose include the role that research partnerships play in supporting community-based adaptations through increased capacity in tribal management related to hunting,

fishing, and gathering practices. It was also acknowledged that individual partnerships support climate change awareness, preparedness, and adaptation strategies. The emphasis on traditional harvest practices was acknowledged as important for supporting cultural resurgence. Cultural practices such as sharing, wise stewardship of resources, and language were all acknowledged for their significance in strengthening community resilience and adaptive capacity in response to change.

Discussion

Comparison with Commonly Accepted Definitions of Food Security

The FAO acknowledges four pillars of food security: availability,[2] access,[3] utilization,[4] and stability[5] (FAO, 2006). While three of the four pillars are similar in name to those developed within the ICC framework, the definitions differ in important ways. The FAO definition acknowledges the need for sufficient, quality food but does not include the roles of healthy ecosystems and the knowledge needed to gather and process food, whereas these concepts are included in the ICC and Interior Alaska definitions of health of traditional harvest practices developed in the workshop. General concepts of accessibility were consistent across the definitions. Both frameworks highlight the importance of resilient food systems that can withstand shocks from both environmental and social causes and remain stable. However, both the ICC and Interior Alaska healthy traditional harvest practices definitions emphasize in addition the mental health importance of protection from forced assimilation through institutionalized forms of education that threaten or undermine the stability of cultural knowledge and practices that support food security. There are some similarities between the FAO pillar of 'utilization' and the ICC dimension of food security 'health and wellness.' Both acknowledge the need for adequate and appropriate food that support nutrition and psychological needs. The FAO food security framework does not include specific provisions for culture nor decision-making power and management as aspects of food security.

Alaska Indigenous Food Sovereignty and Security

It is important to note that presenting results from a workshop of contemporary perceptions of traditional harvest practices does not create an authoritative definition of food security among Indigenous communities of Interior Alaska, which would necessarily require broader input and consensus through the entire region. However, these results do illuminate the unique characteristics of food security, insecurity, and sovereignty that can provide a foundation for effective community-based adaptations.

Broadening the commonly accepted definition of food security to include food sharing, the health of ecosystems, decision-making power, and culture as it relates to Indigenous communities in Alaska is an important step toward supporting community-based adaptations. Relying on and sharing of fish, wildlife, and other harvested resources continue to be an integral part of physical, mental, and spiritual wellness, education, socio-economic development, and cultural identity. The practices and knowledge needed to harvest wild resources strengthen both food security and overall adaptive capacity of

[2] "Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid)" (FAO, 2006, p. 1).

[3] "Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources)" (FAO, 2006, p. 1).

[4] "Utilization: Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security" (FAO, 2006, p. 1).

[5] "Stability: To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security" (FAO, 2006, p. 1).

Indigenous communities in Alaska (Barnhardt & Kawagley, 2005; CATG, 2016). The body of knowledge contained in traditions among tribal members and Elders can provide sources of strength and guidance to communities as they face current and future change (Watson & Huntington, 2014).

Another important step in supporting community-based adaptations is building institutional mechanisms that can support Indigenous communities effectively as they continue to navigate complex change. With the interconnections between traditional harvest practices, the cash economy, western education, and western governance systems, effective community-based adaptations cannot be accomplished without engaging in these contemporary western systems. Navigating these systems today requires capacity development beyond the breadth of knowledge gained through participation in hunting, fishing, and gathering practices alone. It now also requires an in-depth knowledge of current regulatory systems, an understanding of how policies are developed, and the ability to formulate and articulate evidence-based proposals that fit institutional requirements or charters on local, statewide, and national scales. Communities must also consider tradeoffs between conservation initiatives that serve to protect traditional harvest species and the habitats they rely on with economic development initiatives that exploit these resources but provide much needed economic opportunity not easily gained in remote rural communities. Consideration of the economic dimension is important because many rural communities rely on cash input to carry out their traditional harvest practices (Brinkman et al., 2014). For example, affordable gasoline is needed to fuel boats, snowmobiles, and ATVs used to access traditional harvest areas.

Role of Multistakeholder Partnerships in Supporting Community-based Adaptations

By creating a holistic, place-based definition of food sovereignty and identifying factors that contributed to both food security and insecurity, CRP workshop participants came away with a tool that validated their experiences and perspectives. This framework illuminated ways that tribes and tribal organizations were already actively advancing food sovereignty by participating in cultural activities such as revitalizing their language, maintaining sharing practices, and continuing to pass down knowledge of hunting and fishing practices to the next generation. It also showed the value of existing advocacy efforts related to hunting and fishing management decisions. The framework highlighted areas where individual research partnerships and broader research initiatives led by collaborators contributed to strengthening food security or responded to different components of food insecurity. For example, mapping traditional place names was identified as significant for not only facilitating the transfer of knowledge between generations, but also providing a resource for state-led land-use planning decisions that would affect traditional use areas. Another study focused on the correlation between temperature, water levels, timing of leaf fall, and moose harvest success. This research was requested by a participating tribe in response to an unsuccessful proposal to a regulatory body that advocated for more adaptive timing of hunting seasons that would take into account the influence of climate variables on harvest success. The resulting research provided useful data to the tribe as they continue to advocate for adaptive management of natural resources.

Although these individual research partnerships and a place-based definition of food sovereignty alone do not lend themselves to suggesting sweeping policy changes, they are examples of ways that community-based adaptations can occur in practice. They highlight the learning process that is integral to adapting to unprecedented change. Due to the complexity of historical socioeconomic factors, and the variability of the ways that climate change will affect different geographic areas, one-size-fits-all solutions are problematic. However, a supporting mechanism that can bridge diverse perspectives, capacities, and areas of influence is a replicable process that can support community-based adaptations (Reid et al., 2009).

Given the interconnected dimensions and complexity of food sovereignty and security, developing mechanisms that support co-production of knowledge, two-way communication and learning among communities, academic entities, agencies,

and nonprofit organizations supports capacity-building among community leaders to navigate the current management, economic, and educational systems (Ford, McDowell, & Pearce, 2015). It also builds capacity among university researchers and resource managers to do work that is important to, and owned by, communities. In addition, this process can build institutional capacity that promotes inclusion of different ways of knowing within non-Indigenous institutions. Groups like Community Research Partnerships for Sustainable Traditional Harvest Practices support the development of such forums. Multistakeholder partnerships can support community-based adaptations by building bridges between Indigenous communities and the tribal organizations that represent them with formal educational institutions, natural resources managers, and policy-makers—all of which influence food security according to the definition developed by CRP workshop participants. Taken together, community, multidisciplinary academic, and agency partnerships provide a mechanism for developing social and communication networks that provide channels for new creative forms of learning and knowledge distribution. These networks can support communities as they negotiate the effects of current and future changes to maintain basic components of standards of living such as food security (Chapin, Knapp, Brinkman, Bronen, & Cochran, 2016). They also can change the way science is done at universities and agencies so that it is more relevant, credible, and legitimate for society (Reid et al., 2016).

Conclusions

In the growing body of adaptation literature, particularly as it relates to Indigenous peoples of the North, there are frequent calls for supporting bottom-up, stakeholder-driven, community-based, and co-produced adaptation solutions that can account sufficiently for the interwoven social-ecological relationships developed through a long-standing interdependence on wild foods (Ford et al., 2018; Loring & Gerlach, 2009; McNeely, 2011; Pearce et.al, 2014). Despite this acknowledgment, there are few studies that put this into practice (Loring & Gerlach, 2015). Our work highlights the valuable insights that are gained when those communities and individuals who stand to be most affected by rapid change are also the ones who identify the framework for developing possible solutions.

Food sovereignty by definition carries inherent meanings of autonomy, authority, and self-governance. Defining the components of food practices in relation to a physical environment, specific culture, and jurisdiction of place is a necessary building block in strengthening food sovereignty, particularly as it relates to Indigenous communities in Alaska (Grey & Patel, 2015). The ICC food sovereignty and security framework, the healthy traditional harvest practices framework, and the definitions developed by CRP workshop participants all emphasize that food security means much more than nutritional value, caloric intake, and purchasing power. A vision of food sovereignty and security for Indigenous people in Alaska encompasses a holistic picture of ecological health and stability, practicing and transmitting a way of life to the next generation, political protection and freedom to maintain culturally based livelihoods, and the freedom to select and integrate adaptations consistent with a way of life in response to current and future environmental, economic, political, and social change. As aptly stated by co-author Huntington, "as tribal people, we have the right to be who we are." Developing a holistic definition of food security is a critical first step toward reaching a regional Indigenous consensus on a formal definition that may inform policy. It also provides a useful reference for developing research in the future that strengthens, rather than diminishes, the capacity of communities to adapt effectively to change.

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Good words, good food, good mind: Restoring Indigenous identities and ecologies through transformative learning

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Abstract

Each year, more interdisciplinary food-related programs are offered at Turtle Island colleges and universities. First Nations Technical Institute (FNTI), an Indigenous postsecondary institution located on Tyendinaga Mohawk Territory, Ontario, is in the process of developing an Indigenous food systems undergraduate degree program. This article shares our thoughts regarding education for food system transformation at FNTI. Transformative learning theory (Mezirow, 2000) presents a framework for adult learning with the potential to effect food system change. Our paper examines this theory considering traditional Haudenosaunee teachings and contemporary thought. Despite the potential for food system transformation, transformative learning theory—grounded in Western thought—can not lead to a truly decolonized food system because it offers the Indigenous learner little to rebuild that which was deconstructed. Although transformative learning theory and Haudenosaunee ways of knowing are incompatible, transformative learning could help Indigenous learners to challenge implicit colonial narratives as part of the process of decolonization. Transformative learning theory may also have value for cultivating allies in non-Indigenous contexts. We are designing our Indigenous food systems program according to traditional Haudenosaunee principles such as

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ka'nikonhri:io (good mind), and we will employ talking circles, common to many Indigenous nations. We suggest that a food system pedagogy, based on traditional teachings and principles from specific Indigenous nations, is the only authentic route to a decolonized and equitable food system.

Keywords
Transformative Learning, Food Systems, Three Sisters, Collectivist, Indigenous Higher Education, Decolonization, Individualist, Relationality, Traditional Ecological Knowledge (TEK)

Introduction

This article explores the compatibility of transformative learning theory (Mezirow, 2000) with Haudenosaunee[1] ethico-onto-epistemology, the concept of inseparable relationship between doing/being/knowing (Barad, 2007; Wilson, 2008), in the context of Indigenous food system education at the postsecondary level. We are currently preparing an Indigenous food systems undergraduate degree curriculum at First Nations Technical Institute (FNTI), based in Tyendinaga Mohawk Territory, Ontario. An increasing number of interdisciplinary food systems programs are offered at Turtle Island[2] colleges and universities each year (Hartle, Cole, Trepman, Chrisinger, & Gardner, 2017). Insights gleaned during the development of our community-based Indigenous food systems degree program—to our knowledge the first of its kind on Turtle Island—can contribute to food system transformation in Haudenosaunee, other Indigenous, and mainstream contexts.

Food systems are socio-ecological in scope and operate at various, often interrelated, scales (Berkes, Colding, & Folke, 2003). They include food production, processing, distribution, consumption, and the outcomes of those activities, which can include food security, social welfare, and the integrity of the natural environment. Food security of a given population is a fundamental function of the food system (Ericksen, 2008). Food insecurity—the opposite of food security—is defined as the lack of access to safe and nutritious foods sufficient for an active and healthy life (Food and Agriculture Organization of the United Nations [FAO], 1996). Estimates suggest that 12.0% of Canadian households were food insecure in 2014 (Tarasuk, Mitchell, & Dachner, 2016), with Indigenous households enduring food-insecurity rates that are over double the national levels (Council of Canadian Academies, 2014; Subnath, 2017). Colonialism has drastically reduced Indigenous peoples' land base for subsistence food production and have decimated traditional knowledges, including those associated with food production and preparation (Coté, 2016). That, in turn, has yielded the high food-insecurity rates and associated unhealthy diets with epidemic levels of diabetes, high levels of cardiovascular disease, and significant mental health issues (Council of Canadian Academies, 2014).

The complexity of food systems (Foran et al., 2014), paired with the significant historical and contemporary effects of the colonial apparatus on Indigenous food systems (Coté, 2016), suggests that a nuanced decolonizing approach is required to address the layered and intersectional barriers faced by Indigenous communities in pursuit of an equitable and sustainable food system. Food system self-determination is supported by the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP), which advocates for Indigenous peoples having the right "to maintain and strengthen their own institutions, cultures and traditions, and to pursue their development in keeping with their own needs and aspirations" (United Nations, 2007, p. 2).

Postcolonial scholars have long argued that the most insidious, intractable, and damaging aspect of colonialism is the colonization of the Indigenous mind—that is, the internalization of imperial perspectives that fix notions of inferiority in the minds

[1] Haudenosaunee peoples (formerly called Iroquois), or people of the longhouse, are the confederacy of six First Nations—Mohawk, Cayuga, Oneida, Onondaga, Seneca, and Tuscarora—all united by a common goal to live in harmony.
[2] 'Turtle Island' refers to North America. This term was popularized, in English, by poet Gary Snyder in his 1974 collection *Turtle Island*. The name is based on the significance of turtles in the creation teachings of various Indigenous nations (including Haudenosaunee).

of Indigenous people themselves (Said, 1993; Sheridan & Longboat, 2006; wa Thiong'o, 1994). Transformative learning, with its emphasis on profound changes in perspective (Mezirow, 2000), holds promise as a tool for decolonizing the minds of Indigenous learners, preparing them to lead efforts toward self-determined food systems. The following sections outline transformative learning theory, introduce FNTI's Indigenous food systems degree program and our talking circle approach, and discuss transformative learning as a decolonizing pedagogic tool in Haudenosaunee contexts.

Overview of Transformative Learning Theory

Transformative learning is an approach to adult education that provides learners with opportunities to experience an accumulation of insights and/or a profound disorienting dilemma that, with the proper support, can lead to critical reflection on the learners' fundamental assumptions and subsequent transformation of the learners' worldview (Mezirow, 2000). Jack Mezirow described 10 phases of transformative learning through his work with women who were re-entering either the workforce or postsecondary education after a significant hiatus (Mezirow, 1991, 1994). The theory has since been amended to include an eleventh phase (see Table 1).

Mezirow (1991) suggests that people construct their world understandings at two cognitive levels, with "meaning perspectives" that comprise clusters of "meaning schemes." Meaning perspectives, also known as frames of reference, are "structures of assumptions within which one's past experience assimilates and transforms new experience" (Mezirow, 1991, p. 42). One's meaning perspective consists of habits of mind that are informed by sociolinguistic, moral-ethical, epistemic, philosophical, psychological, and aesthetic perspectives (Mezirow, 2000). Perspectives manifest as points of view that comprise clusters of meaning schemes. A meaning scheme is a "constellation of concept, belief, judgement, and feeling which shapes a particular interpretation" (Mezirow, 1994, p. 223). As Mezirow (1991) illustrates, an ethnocentric meaning perspective may lead to specific meaning schemes such as the negative racial stereotype of a specific group of people.

Critical reflection of assumptions can lead to a shift in one's meaning schemes, which can cumulatively lead to a shift in meaning perspective. Critical reflection includes both objective and subjective reframing (Mezirow, 1998). Subjective reframing involves the critical assessment of one's own assumptions, whereas objective reframing deals with the reframing of the assumptions implicit in a text or activity (Mezirow, 1998).

Critical reflection can be precipitated by an accumulation of dilemmas or a profoundly disori-

Table 1. The Phases of Transformative Learning

Phase	
1	A disorienting dilemma or series of dilemmas
2	Self-examination with feelings of guilt or shame
3	A critical assessment of epistemic, sociocultural, or psychic assumptions
4	Recognition that one's discontent and the process of transformation are shared and that others have negotiated a similar change
5	Exploration of options for new roles, relationships, and actions
6	Planning a course of action
7	Acquisition of knowledge and skills for implementing one's plans
8	Provisional trying of new roles
9	Renegotiating relationships and negotiating new relationships
10	Building of competence and self-confidence in new roles and relationships
11	A reintegration into one's life on the basis of conditions dictated by one's new perspective

Source: Adapted from Mezirow, 1994.

enting dilemma that challenge existing meaning schemes or meaning perspectives (Mezirow, 1991). In this theory, the role of the transformative educator is to create an environment that is conducive to critical reflection and supportive of each of the eleven phases of transformative learning (Cranton, 2006).

Transformative learning has generated significant interest since the 1970s, resulting in hundreds of scholarly publications and dozens of books on the subject as well as an academic journal devoted to this theory, the *Journal of Transformative Education* (Mezirow, 2006). A limited number of papers focus on agriculture and food systems, including Davila and Dyball's (2015) paper on transformative learning as an approach to revitalizing food systems in urban Australia. Another article explores the transformative potential of a course offered by well-known activists Vandana Shiva and Satish Kumar that "offers a physical, community-based site of resistance to the dominant industrial agri-food system" (Etmanski, 2018, p. 152). In a recently published collection, Tristan Reader and Terrol Dew Johnson (2017) describe a Tohono O'odham food system program that draws on both transformative learning and Freire's (2012) conscientization. Davila and Dyball (2015) and Etmanski (2018) draw explicitly from Mezirow's (2000) transformative learning theory. Reader and Dew Johnson (2017) do not specifically mention Mezirow's theory, although it may be implicit in their project design. Each of the aforementioned articles offers useful insights for our work at FNTI. However, only Etmanski (2018) identifies some of the cultural biases associated with transformative learning theory.

Other interesting developments include evidence that perspective transformation can be persistent (Courtenay, Merriam, & Reeves, 1998), applicable across cultures (Merriam & Sek Kim, 2008), modified to recognize nonhuman agency (Barrett et al., 2017), and can be inclusive of the affective domain (Dirkx, 2006; Taylor, 2007). This all suggests that transformative learning theory holds significant promise for facilitating an enduring change in our dysfunctional food system.

FNTI's Indigenous Food Systems Degree Program and the Talking Circle Approach

First Nations Technical Institute is an Indigenous-run postsecondary institute, established in 1985, situated on Tyendinaga Mohawk Territory in Ontario, Canada. FNTI offers both on-campus and in-community programming and has taught Indigenous learners from 102 of the 129 Ontario First Nations, as well as students from Indigenous communities across Canada.

The province of Ontario recently passed the Indigenous Institutes Act (the Act), effectively granting Indigenous postsecondary institutes[3] the latitude to govern themselves and to offer university degrees (Indigenous Institutes Act, 2017). The Act supports Indigenous self-determination through Indigenous control of Indigenous postsecondary education, in the spirit of reconciliation and to honor the United Nations Declaration on the Rights of Indigenous Peoples, to which Canada is a signatory party (Province of Ontario, 2017). In response to this legislation, and with direction from community leaders and knowledge keepers, FNTI is developing several baccalaureate-level degree programs in key areas, one of which is Indigenous food systems. This four-year degree program, which at the time of this writing is still under development, has as its primary goal the revitalization of Indigenous identity in relation to the individual, family, community, nation, and natural and spiritual world. The Indigenous food systems degree program will support learners to first restore or strengthen their own cultural fluency and then to learn about the various dimensions of Indigenous food system revitalization (e.g., community development, ecological restoration, agricultural skills, wild food gathering), all of which are grounded in both Haudenosaunee worldviews and traditional ecological knowledge (TEK). They will also learn

[3] Ontario's Indigenous Institutes are similar to Native American Tribal Colleges in the United States. There are currently nine Indigenous-governed and -operated postsecondary institutes in Ontario that serve the education and training needs of the communities in which they are based. More information about Ontario's Indigenous institutes can be found at https://news.ontario.ca/maesd/en/2017/11/ontario-breaking-ground-in-indigenous-postsecondary-education.html

from Western and other cultural food system approaches where relevant. FNTI's curricular approach for the Indigenous food systems degree program is very different from mainstream approaches in agriculture and food systems–related higher education. Rather than surveying the key scientific disciplines that inform or support a mainstream undergraduate science degree, the FNTI curricular approach uses the first two years of this degree to restore or strengthen the learner's cultural identity, with a special focus on cultural elements related to the food system (e.g., food and ceremony, food and expressive culture, Indigenous traditional ecological knowledge). This two-year immersion in Indigenous culture will be applied by the students in specific food-related courses in years three and four, such as greenhouse production and management, Indigenous gathered foods and nutrition, soil and water management, and sustainable plant production. FNTI students come from a range of Indigenous cultural backgrounds, such as Haudenosaunee, Anishinaabe, and Cree. The hiring of staff based on their cultural fluency and the of leveraging student understandings for group learning allow for program delivery in culturally mixed classrooms and classrooms with one predominant culture. In addition, we are exploring opportunities to formally enhance the Anishinaabe content of our program curriculum.

The Indigenous food system degree program will employ FNTI's pedagogic approach, including use of the talking circle. Faculty members are encouraged to start and finish each day with a talking circle. Talking circles are thought to have originated as a form of parliamentary procedure with Plains Indigenous groups in what is now Canada and the United States (Mehl-Madrona & Mainguy, 2014). Talking circles, and the related healing circles, sharing circles, and peacemaking circles have found broad applicability in fields as diverse as wildlife conservation (Simmons, Bayha, Beaulieu, Gladu, & Manseau, 2012), healthcare (Rothe, Ozegovic, & Carroll, 2009), education (Winters, n.d.), restorative justice, and by feminist community activists (Umbreit, 2003).

The circle form is viewed as sacred across a number of Indigenous cultures (Running Wolf & Rickard, 2003). It signifies and honors the interconnectedness of all things by reflecting form and process from the natural world, such as bird nests, the pattern in which animals mark their territories, and the moon and sun and their trajectories across the sky (Mehl-Madrona & Mainguy, 2014; Ontario Ministry of Education, 2009; Wilber, Wilbur, Tlanusta Garrett, & Yuhas, 2001).

The FNTI talking circle brings together participants and a facilitator—usually the instructor—in a nonhierarchical activity in which everyone can share their experiences, without interruption, in a supportive, nonjudgmental and nonconfrontational manner (Fleishhacker, Vu, Ries, & McPhail, 2011). Talking circles are often used to support healing and transformational experiences for participants (Kholghi, Bartlett, Phillips, Salsberg, McComber, & Macaulay, 2018; Lowe & Wimbish-Cirilo, 2016; Wilbur et al., 2001). At FNTI, students bring their 'whole person' to the circle. So, although the opening focus may be on curricular material or another aspect of the educational experience, all aspects of the individual—heart, mind, body, and spirit—are shared (Nabigon, Hagey, Webster, & MacKay, 1999). Talking circles support personal transformation, which complements, and is complemented by, the academic learning that takes places at FNTI. The talking circle approach will be an important component of the new Indigenous food systems degree program. The talking circle is one of a suite of approaches that will facilitate learners' rediscovery of their culture and will help them make sense of their lives and future aspirations in reference to the Indigenous food systems degree curriculum and more.

Transformative Learning Theory and the Decolonization of Indigenous Food Systems

From our experience and based on the words of students and graduates from FNTIs programs, our pedagogic approach can facilitate profound personal growth for our learners.[4] This section explores the question: how can transformative learning theory contribute to education for a decolonized food system?

[4] Student testimonials regarding their experiences at FNTI can be found at https://fnti.net/testimonials-new

Transformative learning results in a profound perspective change caused by one or more disorienting dilemmas (Mezirow, 2000). Presumably, the outcome of transformative learning is dependent upon the values, personal history, and other characteristics of the individual undergoing a transformation and the nature of the disorienting dilemma(s) that they undergo. We suggest that the resultant transformation is also influenced by the models of change specific to the cultural context in which the learning is taking place. These two classes of interrelated factors —the individual and the cultural/societal—influence both the way that transformative learning is enacted and the outcome of that learning. We examine both below.

The intergenerational trauma resulting from residential school, language loss, and other forms of cultural genocide poses significant barriers to success for Indigenous learners in postsecondary institutions (Battiste, 2016; Reader & Dew Johnson, 2017). Transformative learning theory is culture-bound (Merriam & Ntseane, 2008) and could serve, at worst, to reinforce the structural, dominant-culture mores that actively erode Indigenous cultural institutions. For example, the role of the teacher in transformative learning environments is to model "the critically reflective role expected of learners. Ideally, the facilitator … become(s) a colearner by progressively transferring her leadership to the group as it becomes more self-directive" (Mezirow, 1997, p. 11). While use of the word 'colearner' in the above quotation suggests a less hierarchical approach, there is a lack of published work indicating that educators have the capacity to be transformed, themselves, by the transformative experiences that they facilitate in the classroom, which suggests an implicit hierarchy.

During talking circles, such as those that take place in FNTI classrooms, the instructor models the openness and vulnerability necessary for group transformation as an active participant (Winters, n.d.). This serves several purposes, one of which is to affirm the nonhierarchical approach inherent in traditional models of Indigenous education. Despite gesturing towards colearning, transformative learning theory has not yet fully articulated a nonhierarchical position for the educator/facilitator. Incorporating transformative learning theory into Indigenous classrooms, in which the instructor assumes a higher and/or separate status than students, reinforces Western values that are antithetical to Indigenous approaches. To take this example further, an Indigenous approach to farming and food gathering positions humans *in relation with* rather than *separate from* the natural world (Salmón, 2012). Educational models, in food systems classrooms, that reinforce hierarchical constructs could plausibly serve to reinforce the Western human/nature dichotomy that, arguably, is associated with the dispossession of Indigenous people from the land, loss of TEK, and has contributed to the current ecological crisis (Cajete, 2000).

Haudenosaunee culture, and Indigenous cultures in general, can be described in collectivist terms (Mohawk & Barreiro, 2010; Morcom, 2017), in contrast to Western or European cultures, which are considered individualistic (Hofstede, 1980). Individualistic societies are typically contractual regarding social relations, with a focus on achieving status and reaching personal goals at the expense of the social (Oyserman, Coon, & Kemmelmeier, 2002; Schwartz, 1990). Collectivist societies are described as having diffuse mutual obligations in which the individual is recognized as part of the group (Schwartz, 1990). Oyserman et al. (2002) identify salient distinctions between collectivist and individualist societies in terms of "self-concept, well-being, attribution style, and relationality" (p. 5). Collectivist societies, according to several authors, are more diverse in terms of "values, attitudes, and behaviors" (Oyserman et al., 2002, p. 5) than individualistic societies (Hui, 1988; Triandis, 1995). For example, regarding relationality in collectivist contexts, Chen, Brocker, and Katz (1998) suggested that in-group favoritism was due to internalized value systems in Chinese students. Yamagishi (1988) in Oyserman et al. (2002) observed that Japanese business students left poorly performing groups despite the expectation that they would exhibit a higher level of in-group favoritism. The aforementioned article concluded that "Japanese cooperation is not due to internalized collectivist values but instead is the result of structural monitoring and sanctioning of non-

contributing free riders" (Oyserman et al., 2002, p. 38). Understanding the motivations of collectivist behavior in Haudenosaunee and other Indigenous cultures would help to better align decolonizing food system educational initiatives with the culture-specific motivations underpinning Indigenous relationality. The following paragraph discusses relationality in Western and Indigenous cultural contexts regarding transformative learning and food system decolonization.

Transformative learning theory has, as a goal, enhanced learner autonomy (Mezirow, 1997). For Mezirow, "thinking as an autonomous and responsible agent is essential for full citizenship in democracy and for moral decision making in situations of rapid change" (1997, p. 7). Transformative learning theory's focus on the individual rather than the collective is at odds with Indigenous relationality. This relationality is a fundamental aspect of Indigenous worldviews and consists of the multiple relationships (and attendant responsibilities) that exist within and between humans and other living and nonliving entities (Weber-Pillwax, 2001). Indigenous scholar Shawn Wilson (2001, 2008) contrasts Western research paradigms, in which the researcher is accountable to standards of ethics, validity, and credibility established by the scholarly community, with Indigenous approaches to research "relational accountability or being accountable to all my relations" (Wilson, 2001, p. 177). The relational ethical stance described by Wilson (2008) is fundamentally at odds with positivist Western conceptions of scholarly activity as value-neutral. Oyserman et al. (2002) describe relationality in individualistic cultures (e.g., mainstream North America and Europe) as a cost-benefit calculation that may result in individuals "leaving relationships and groups when the cost of participation exceeds the benefits and creating new relationships as personal goals shift" (p. 5). In the same paper, relationships in collectivist societies are identified as being more fixed and stable, with "in-group exchanges based on equality or even generosity principles" (p. 5). Following Oyserman et al.'s (2002) description, transformation is likely a group endeavor in collective societies (e.g., via talking circles). The tension between Indigenous relationality and Western cultural concepts that situate humankind—specifically European, male, heterosexual humans—as the only viable 'subject' (Butler, 2004; Culhane, 1998) contributes significantly to the continued suppression and even erasure of Indigenous identity as exemplified by myriad assimilationist policies (Coulthard, 2014). Supporting, and in some cases restoring, Indigenous relationality is critical for decolonized self-determination in the food system and in other spheres, but neither supporting nor restoring Indigenous relationality are consistent with the individualistic premises of Western systems of thought.

Haudenosaunee culture is dynamic, despite early conceptions of Indigenous culture as monolithic and unchanging (Antone, 2013; Mohawk & Barreiro, 2010). Long before European contact, the Kaianerkó:wa (Great Law of Peace) brought together disparate nations under the Haudenosaunee confederacy, which later served as a model for the United States Constitution (Schaaf, 1988). The Kariwiyo (which translates as "Good Word"), also known as the Handsome Lake Code, was received by the Seneca prophet Handsome Lake in 1799 from four spirits while he was on his deathbed. He recovered and shared the revealed message, which provided the Haudenosaunee with guidance for how to continue being Haudenosaunee, in spite of colonial invasion and acculturation (Antone, 2013; Johansen & Mann, 2000). The Kariwiyo reinforced the importance of the Three Sisters (corn, beans, and squash) polyculture system as critical to Haudenosaunee identity and reframed gender roles around agriculture so that men could participate more in what was once a largely female domain (Antone, 2013). In more recent times, Haudenosaunee culture has evidenced similar fortitude in the face of significant challenges exemplified by the diplomatic role of Haudenosaunee leaders in establishing processes for the recognition of Indigenous rights at the United Nations (Akwesasne Notes, 2005); the work of the Akwesasne Task force on the Environment, which has successfully navigated in both the world of Western science and traditional knowledge to effect positive environmental change for the Indigenous community (Santiago-Rivera, Morse, Hunt, & Lickers, 1998); and the Iroquois White Corn Project (Dion-Buffalo & Mohawk, 1999), which

played a key role in revitalizing the use and cultivation of traditional white corn in the broader Haudenosaunee community.

As the above examples demonstrate, change, adaptation, and persistence are central to Haudenosaunee culture. Traditional conceptions of transformative change can be drawn from the original teachings of the Kaianerkó:wa, such as the principle of ka'nikonhri:io, which can be translated as the 'good mind' which "occurs when the people put their minds and emotions in harmony with the flow of the universe" (Mohawk & Barreiro, 2010, p. 33). The 'good mind' confers the ability to make a sound judgment for the welfare of the broader Haudenosaunee society. The 'good mind' is necessary for the enactment of other Haudenosaunee principles and is a precondition for becoming Onkwehonwe, a word that means original people. Onkwehonwe also connotes the unassimilated, old-growth mind, a mind that is inseparable from territory (Sheridan & Longboat, 2006). Sheridan and Longboat (2006) importantly assert that "only with restored identities can we know when restored ecologies have reestablished their authenticity" (p. 367).

Oneida scholar Robert Antone (2013) prepared a curricular approach to transformational learning based on the Seven Spans paradigm from the Kaianerkó:wa, which refers to "the quality of person one has to be to be a leader" (p. 45). Antone (2013) shares that, according to the Great Law of Peace, seven spans of skin are necessary to be a good leader, and those seven spans result from "journey[ing] through seven circles of life experience" (p. 51). A teaching is passed on for each circle of life experience, and these teachings contribute to the development of the 'good mind.' Antone's (2013) approach to transformational learning is based on lessons from the seven life stages, all of which contribute to decolonization and restoration of the ka'nikonhri:io. One example he shares involves teaching about growing corn: "for a Haudenosaunee agriculturalist, it is not simply about farming but about the wholeness of one's relationship to the land, culture, teachings, ceremony, and spirit" (p. 190). The Three Sisters are critical as traditional food sources and are essential for ceremonial life. They provide spiritual and physical sustenance, and connect the Haudenosaunee agriculturalist with the cosmos, with each other, and with the natural world (Antone, 2013). Antone suggests bundling this knowledge to "build self, family, clan, and community, which, in turn, builds nation" (p. 190).

At its best, transformative learning theory could provide the learner with critical tools to actively question assumptions implicit in Western culture narratives, such as the primacy of the scientific method as a way of knowing, the hierarchical relationship to the natural world, patriarchal gender roles, and more. The questioning of colonizing narratives is an important aspect of decolonization; however, transformative learning theory and other Western cultural constructs offer the Indigenous learner little to rebuild that which was deconstructed.

Following Antone (2013) and Sheridan and Longboat (2006), we suggest that authentic decolonization can only happen through the restoration of Haudenosaunee systems of thought such as the ka'nikonhri:io. Transformative learning theory (Mezirow, 2000) is inherently Western and as such will not yield the decolonized food systems advocated for by Indigenous food sovereigntists, thinkers, and activists. Despite this, there could be a role for transformative learning theory in Indigenous food system education contexts. Critical reflection and disorienting dilemmas can be useful ways for Indigenous learners, especially those without a strong Indigenous cultural background, to interrogate the impacts of acculturation on Indigenous food systems. Transformative learning can be used up to and including phase four of the transformative learning process, which involves recognizing that other people have faced similar challenges and have undergone personal transformation (Mezirow, 1994). Phases five through eleven require learners to reconstruct the meaning perspectives that were challenged during the first four phases of the transformative learning process. At this juncture, a curriculum based on Haudenosaunee principles is essential for decolonization; for reconstructing learners' Haudenosaunee mindset rather than recolonizing the learners with Western cultural norms. Phase five through eleven must be informed by Haudenosaunee concepts such as

ka'nikonhri:io and would ideally occur in group learning environments to foreclose the reproduction of Western cultural norms. Phases five through eleven, like phases one through four, follow a logical sequence and rely heavily on rationality and individualism—in the form of critical self-reflection (Mezirow, 1998)—as the engine of transformative change. In fact, Mezirow (2009) states that "transformative learning may be understood as the epistemology of how adults learn to reason for themselves" (p. 23). We do not deny the importance of rational thought for personal development and transformation; however, we recognize and celebrate the role of other ways of knowing that are either excluded from, or remain invisibly implicit in, the transformation occurring via Mezirow's eleven phases. Indigenous ways of knowing encompass more than rationality and can include empirical, intuitive, spiritual, and revelatory aspects, traditional teachings, and generally involve a communal construction of knowledge (Castellano, 2000; Luarkie, 2017; Wilson, 2008). Philosophical orientations, such as Indigenous epistemologies, that encompass multiple ways of knowing that are rooted in territorial gestural meaning (Sheridan & Longboat, 2006; Zwicky, 2014) offer the best hope to profoundly transform the broken relationship between humans, the food system, and the rest of the natural world by reviving learners' desire and ability to attend to the "circumstances of being alive in the world, the dependencies, cultural and physical, animate and inanimate, that are inseparable from human existence in the world" (Zwicky, 2014, p. 142).

A transformative learning approach to food systems education, based on culture-specific principles, is critical for decolonizing Indigenous food systems. As several authors point out (Hui, 1988; Oyserman et al., 2002; Triandis, 1995), collectivist-type cultures exhibit far greater diversity in the ways that collectivism manifests, compared with individualist-type cultures. This suggests that transformative learning theory cannot simply be adapted to all collectivist cultures and then applied across the world. Neither can transformative learning be adapted for 'Indigenous' contexts and be applicable across the great diversity of cultures native to Turtle Island. Food system education initiatives in Indigenous communities, based on the traditional principles of those nations, would contribute to both our understanding of culture-specific transformative learning and to the aims of the broader Indigenous food sovereignty movement. This proposed retheorization of transformative learning could help to eliminate the implicit colonial underpinnings inherent in the purportedly 'neutral' educational approaches endorsed in the name of equity and social justice.

Food systems education initiatives in Haudenosaunee contexts that incorporate principles from the Kaianerkó:wa (Great Law of Peace) and more recent contributions (Antone, 2013; Mohawk & Barreiro, 2010; Sheridan & Longboat, 2006) would, over time, provide the experience necessary to fully articulate an approach to transformative food systems education grounded in Haudenosaunee principles. We are hoping to contribute to a more realized Haudenosaunee approach to transformative food systems education at First Nations Technical Institute, and we hope that others will engage in similar culturally localized, practice-informed theory-building in their respective areas.

Transformative learning theory could also be employed to facilitate a transformation in the way that non-Indigenous learners understand the extent to which Indigenous food systems have been impacted by colonialism and the dominant culture's role in maintaining control over the narratives around food system change. As Sumner (2017) points out, Indigenous "food systems, although crippled by colonization, represent living alternatives to the corporate food regime" (p. vii). Transformative learning in non-Indigenous contexts, particularly that which recognizes the relationality inherent in the more-than-human (such as Barrett et al., 2017; Weber-Pillwax, 2001), could be a valuable way to expand the horizon of possibilities for change in the mainstream food system. Transformative learning in postsecondary food system education could also help non-Indigenous learners to understand how to be good allies to Indigenous peoples involved in the food sovereignty movement.

Conclusions and Further Research

The FNTI Indigenous food systems undergraduate degree, currently under development, offers several innovations that could be of interest to food system educators in Indigenous and mainstream contexts. First, we place considerable emphasis on cultural revitalization in the first two years of the program to provide learners with an opportunity to learn and share traditional teachings in a supportive group environment. Second, we will employ (as per standard practice at FNTI) talking circles in the food systems classroom to facilitate the collective learning journey. Third, our curriculum draws on traditional teachings and principles such as the Kaianerkó:wa (Great Law of Peace), ka'nikonhri:io (good mind), and the Kariwiyo (Handsome Lake Code) to reinforce cultural values that support a more egalitarian and relational food system. Fourth, and finally, we are building our curriculum on a foundation of TEK regarding agriculture and wild food harvesting, including experiential learning that incorporates the Three Sisters (corn, beans, and squash) polyculture, traditional approaches to seed germination and pest management, and the planting of heirloom crop varieties (e.g., the Deseronto potato bean, Iroquois white corn, Seneca horn potato, Buffalo Creek squash) in our greenhouse and field sites. In our assessment, transformative learning theory (Mezirow, 2000) has the potential to help Indigenous learners to challenge colonial narratives and could also help to support non-Indigenous allies in mainstream contexts. However, transformative learning theory, grounded in Western ways of knowing, is not sufficient for an authentic decolonized approach to Indigenous food systems education.

This paper presents some of our preliminary ideas regarding the first, to our knowledge, Indigenous food systems undergraduate degree program on Turtle Island. We plan to continue documenting the evolution of our program, and we hope that this paper will inspire other groups to initiate similar programs in Indigenous contexts (e.g., Tribal Colleges in the United States, Indigenous Institutes and other Indigenous postsecondary institutions in Canada, and Indigenous Intercultural Universities in Latin America and the Caribbean), or in mainstream universities that serve Indigenous communities. Further research that would benefit our Indigenous food systems program at FNTI and others involved in decolonizing Indigenous food systems education initiatives at the postsecondary level include:

- Studying the applicability of transformative learning theory and the use of traditional teachings and principles in other Indigenous food system higher education environments would help to create both a body of evidence and principles to support further decolonizing food systems education initiatives, which ideally would lead to more just and healthier communities and food systems;
- Exploring the use of transformative learning theory for supporting non-Indigenous food system allyship could build on the goodwill in the alternative food movement toward Indigenous food systems activists, advocates, and researchers;
- Documenting the long-term implications of our educational model on learners and their communities, both during the four-year degree and after graduation, would help us to serve our learners and their communities more effectively;
- Documenting traditional ecological knowledge (TEK) about specific Haudenosaunee agricultural practices and crop varieties for incorporation into our curriculum would deepen our ability to teach students to revitalize a more fully realized Haudenosaunee food system; and
- Determining how best to prepare and support teachers to deliver a decolonized food systems curriculum in Indigenous contexts would ensure the efficacy of our program and develop a cadre of instructional staff who could share their expertise with their Indigenous and mainstream food system education colleagues in other institutions.

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Growing intergenerational resilience for Indigenous food sovereignty through home gardening

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Abstract

As a community-based participatory research project designed to promote health and wellbeing, Growing Resilience supports home gardens for 96 primarily Eastern Shoshone and Northern Arapaho families in the Wind River Reservation, located in Wyoming. Through analysis of data from two years of qualitative fieldwork, including stories told by 53 gardeners and members of the project's community advisory board in talking circles and through our novel *sovereign storytelling* method, we

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Contributors and Supporting Agencies

Blue Mountain Associates, Eastern Shoshone Tribal Health, Wind River Development Fund, Growing Resilience Community Advisory Board, National Institutes of Health

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investigated if and how these participants employ relationships, knowledge, and practices across generations through home gardening. We find that participants describe home gardening within present, past, future, and cross-generational frames, rooted in family relationships and knowledge shared across generations. Our analysis of these themes suggests that gardening provides families a means to transmit resilience across generations or, as we call it here, *intergenerational resilience*. We conclude by discussing intergenerational resilience as a culturally specific mechanism of social-ecological community resilience that may be particularly relevant in Indigenous movements for food sovereignty.

Keywords
Intergenerational Resilience, Food Sovereignty, Community Resilience, Social-Ecological Systems, Sovereign Storytelling, Growing Resilience, Indigenous, Historical Trauma

Introduction

The international peasant movement Via Campesina defines food sovereignty as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Via Campesina, 2007, para. 3). This vision of food sovereignty also includes gender, labor, and Indigenous rights (McMichael & Porter, 2018). Though such a universal rights–based perspective does not draw on Indigenous worldviews of collective wellbeing and connections to the environment, liberatory power transfers in food systems are essential to food sovereignty, including in Indigenous contexts (Carney, 2012; Coté, 2016; Kamal, Linklater, Thompson, Dipple, & Ithinito Mechisowin Committee, 2015; Patel, 2009). More specifically, Indigenous food sovereignty requires moving beyond rights to focus on the "cultural responsibilities and relationships that Indigenous peoples have with their environment. It also requires examining the efforts being made by Indigenous communities to restore these relationships through the revitalization of their Indigenous foods and ecological knowledge systems as they assert control over their own well-being" (Coté, 2016, p. 2).

Growing Resilience, a community-based participatory research (CBPR) project, is part of one such effort toward Indigenous food sovereignty. The project provides installation and maintenance support for home food gardens to 96 families living in the Wind River Reservation (WRR) in Wyoming. Eastern Shoshone and Northern Arapaho people in the WRR experience enormous health disparities, including obesity, diabetes, and dying up to 30 years earlier on average than White people in Wyoming (Porter, Wechsler, Hime, &, Naschold, 2019; Williams, 2012). Growing Resilience aims to reduce those disparities, support local food sovereignty leadership, and evaluate health impacts of home gardens using a randomized controlled trial design (Growing Resilience, n.d.; Porter, Wechsler, Naschold, Hime, & Fox, 2019).

Growing Resilience originated conceptually in 2011 when the Indigenous-led, WRR community organization Blue Mountain Associates participated as one of five community-based organizations in the Food Dignity project. Food Dignity was a CBPR project that investigated and supported how community-based organizations across the country work toward food justice (Porter, Woodsum, & Hargraves, 2018; Sutter, 2018) and its "close cousin," food sovereignty (McMichael & Porter, 2018). Blue Mountain Associates found that community interest in food gardening exceeded their resources to support new gardens.[1] Thus, following a pilot phase, Growing Resilience partners secured

[1] Prior to foreign intrusion, Eastern Shoshone and Northern Arapaho people were mainly non-agricultural, primarily practicing hunting and gathering, with Northern Arapaho people also originally practicing supplemental crop cultivation (Anderson, 1994; Dorsey & Kroeber, 1997; Loether, 2011). Agricultural practices such as gardening became prominent in WRR-based life due to hunger, the imposition of agricultural materials, and federal promotion of home gardening during World War II. Elders in the WRR specifically recall that gardens provided important subsistence during the boarding school era (Arthur & Porter, 2019). While gardening emerged later and through the colonization process, Eastern Shoshone and Northern Arapaho community members emphasized gardening with Blue Mountain Associates in the Food Dignity project as a way to increase control over their food system and self-determination in keeping with Indigenous food sovereignty.

funding from the National Institutes of Health (NIH) to provide and evaluate health impacts of home gardens, with Blue Mountain Associates providing the garden support. Additionally, the community advisory board that guides the project, along with other project partners, desired to document much more than quantifiable, individual health outcomes from the collaboration.

Accordingly, we pursued qualitative inquiries into processes and outcomes of wellbeing and resilience through home gardening experiences. In this paper, we investigated if and how participants in Growing Resilience build relationships, knowledge, and practices across generations through gardening. This generational focus first emerged during our field experience with Blue Mountain Associates and the community advisory board, with their recollections of past home gardening in WRR and in their own family histories. We then explored what we call *intergenerational resilience* embedded in participants' stories, based in frameworks of Indigenous food sovereignty and community resilience.

Literature Review

We grounded our investigation of resilience across generations through home gardening in a review of approaches from Indigenous food sovereignty, socio-ecological community resilience, and Indigenous resilience.

Indigenous Food Sovereignty

Foundational food sovereignty perspectives are based on rights and require cultural diversity and appropriateness (Via Campesina, 2007). Indigenous perspectives on food sovereignty also focus specifically on relationships, including with other people, ancestors, living things, and the land, centralizing individual and community wellbeing (Coté, 2016). The processes of decolonization and self-determination, based not necessarily in the state but in terms of struggles for collective autonomy, are integral to Indigenous food sovereignty (Grey & Patel 2015).

An Indigenous kincentric ecology, one that interactively connects people and other ecosystem elements in common ancestry or kinship, further explains the relational basis of many Indigenous food sovereignty efforts (Salmón, 2000). For Nuu-cha-nulth people in British Columbia, for example, food sovereignty emerges from decolonization and reclamation of traditional lands and control of fisheries. Coté (2016) describes how those efforts are based in iisak,[2] or respect, and ancestral knowledge that guide an interconnected web of relationships with other people and all living things. For the O-Pipon-Na-Piwin Cree people in Manitoba, food sovereignty—including hunting, wild food gathering, and gardening—finds a basis in wechihituwin, "any means of livelihood that is shared and used to help another person, family, or the community" (Kamal et al., 2015, pp. 565–566). Their Food from the Land program supported harvesting wild foods, sharing gathered food in the community, and elder-facilitated gathering classes for youth. Through storytelling, elders explained how sharing and youth training based in wechihituwin informed their distinctly relational approach to decolonization (Kamal et al., 2015).

Grey and Patel (2015) draw on Adelson's (2000) work with Cree people highlighting their concept of miyupimaatisiium or "being alive well." Based in connections to the land and access to traditional food, they apply the concept to Indigenous food sovereignty beyond the Cree culture. They further suggest that food provides a particularly resonant way to understand wellbeing and shared relationships between Indigenous people and land.

Social-Ecological and Community Resilience Frameworks

The centrality of relationships and interconnections between people and ecosystems in Indigenous food sovereignty overlaps with social-ecological systems and community resilience perspectives. Emerging from ecology, these perspectives attempt to blend coupled human and natural systems into one framework (Berkes & Folke, 1998; Westley, Carpenter, Brock, Holling & Gunderson, 2002). Striving for resilience—the ability of social and

[2] Following best practices suggested by Indigenous thinkers and restorative justice writers to support decolonization and reduced marginalization in writing style, we have opted to present Indigenous words without italicization (see Valandra, n.d.).

ecological systems to adapt to change and disruption—is a hallmark of these approaches (Folke, 2006; Walker, Gunderson, Kinzig, Folke, Carpenter, & Schultz, 2006).

In these frameworks, food systems resilience is "capacity over time of a food system and its units at multiple levels to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances" (Tendall et al., 2015, p. 19). Through case studies of food systems in southern states, Worstell & Green (2017) developed an index based on eight qualities of resilient food systems, including local self-organization. King (2008) suggests that alternative agricultural practices, including community gardens, can benefit from social-ecological systems approaches to build resilient communities and ecosystems. In the Czech Republic, survey data indicate that self-provisioning of food through home gardens contributes to resilience beyond immediate economic benefits to strengthen social ties through food sharing practices (Jehlička, Daněk, & Vávra, 2018).

Social-ecological systems resilience and food sovereignty share similarities, including a shift in attention to local knowledge and governance, a focus on both human and natural elements, and a process orientation (Walsh-Dilley, Wolford, & McCarthy, 2016). Social-ecological systems resilience, however, receives criticism for an overemphasis on formal institutions as opposed to human activity and agency, approaches that are overly functionalist, inattention to specific cultural and historical contexts, universal frameworks that do not allow for consideration of social diversity within and between communities, and notably, inattention to power (Brown & Westaway, 2011; Cote & Nightingale, 2012; Fabinyi, Evans, & Foale, 2014, 2014; Olsson, Jerneck, Thoren, Persson, & O'Byrne, 2015). Lessons from food sovereignty add a sharper focus on power and social justice to these resilience frameworks (Walsh-Dilley et al., 2016).

Integrated community resilience, emerging from social-ecological systems, psychology, and community development perspectives, provides a more fitting framework for Indigenous food sovereignty than broader social-ecological approaches (Berkes & Ross, 2013). As "the existence, development, engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise" (Magis, 2010, p. 402), community resilience includes characteristics of people-place relationships, social networks, knowledge and skills, and values and beliefs (Berkes & Ross, 2013). Rather than a focus on systems, community resilience focuses on community in place—real people engaged in physical locations and relationships (Amit & Rapport, 2002; Berkes & Ross, 2013; Cohen, 1985). Following the ample literature on the problematic notion of a monolithic 'community' (see, e.g., Agrawal & Gibson, 1999; Dove, 2006; Fabinyi et al., 2014; Titz, Cannon, & Krüger, 2018), community resilience and critiques of broader social-ecological systems perspectives recognize that resilience responses vary across cultures and contexts (Berkes & Ross, 2013; Cote & Nightingale, 2012; Leslie & McCabe, 2013).

While more fitting for people's connections to land and place in Indigenous food sovereignty than broader social-ecological systems perspectives, community resilience requires further empirical research, including specific research into how communities respond to change and draw on social memory from the past to inform responses in the present and into the future (Vaneeckhaute, Vanwing, Jacquet, Abelshausen, & Meurs, 2017). Therefore, we finally turn to Indigenous and other perspectives on resilience that highlight relational and multigenerational responses to drastic changes and trauma.

Indigenous Resilience

Indigenous resilience highlights individual, family, and community-level perseverance and thriving despite historical trauma and ongoing structural violence (Kirmayer, Dandeneau, Marshall, Phillips, & Williamson, 2012; Kirmayer, Gone, & Moses, 2014). Historical trauma "is the legacy of numerous traumatic events a community experiences over generations and encompasses the psychological and social responses to such events" (Evans-Campbell, 2008, p. 320). A deep literature explains how trauma is physically, mentally, and spiritually transmitted across generations as a result of colonization (see, e.g., Brave Heart & DeBruyn, 1998,

Evans-Campbell, 2008; Fast & Collin-Vézina, 2010). That trauma both challenges and requires resilience of Indigenous people (Fleming & Ledogar, 2008), for example, as indicated by varied responses to the trauma inflicted by boarding schools (Colmant, Schultz, Robbins, Ciali, Dorton, & Rivera-Colmant, 2004; Wexler, 2006).

Ethnographic research into Maidu people's efforts for Indigenous representation on a stewardship council in California suggests that recognition of historical trauma is a prerequisite for healing and action (Middleton, 2010). Anthropological perspectives explain trauma responses as relational, with healing occurring through connection with others, including in ways that often have little to do with the traumatic events themselves (Lester, 2013). Previous research examining the historical trauma response of Palestinian refugees employs the phrase "intergenerational resilience" in ways akin to our approach here, including elders sharing cultural stories with children and learning for everyday resistance (Atallah, 2017). Denham's (2008) ethnographic research with Nez Perce families demonstrates that they transmit resilient strategies through strength-based family narratives about historical trauma. Similarly, the Roots of Resilience mental health project suggests that—much like community resilience and Indigenous food sovereignty—Indigenous perspectives extend resilience to the community through stories that provide connection between individuals, families, the environment, ancestors, and other living things from the past to the present (Kirmayer et al., 2012).

Perspectives from Indigenous food sovereignty, social-ecological community resilience, and Indigenous and generational resilience are relational, including relationships between people and their environment over time. Together, the bodies of literature above provide a foundation for our investigation of the relationships, knowledge, and practices that home gardeners employ across generations in Growing Resilience. Through this review, we also uncover opportunities to extend concepts of the generational transmission of resilience and provide further empirical investigation of community resilience and Indigenous food sovereignty.

Methods

The entire Growing Resilience project, including this qualitative inquiry, adopts a community-based participatory research approach (CBPR). CBPR is a variant of action research, which engages community and academic co-researchers in research design, implementation, and dissemination with an explicit, ideal goal to enhance equity and promote social transformation through the research process (Greenwood & Levin, 2007; Israel, Eng, Shulz, & Parker, 2013). Additionally, participatory action research methods may not only assess but actively build community resilience through the research process itself (Ross & Berkes, 2014; Vaneeckhaute et al., 2017). These ideals, of course, are not always actualized, including within food justice-focused research (see e.g., Bradley & Herrera, 2015; Porter & Wechsler, 2018; Woodsum, 2018). Building from this CBPR approach, we pursued this inquiry with a broad ethnographic methodological orientation through which we conducted two years of fieldwork from 2016 to 2018. With a commitment to ethnographic interpretation of meaning and "thickness" of description and analysis to honor the lived experiences of the research participants, we wove together multiple interrelated methods, including participant observation and other qualitative methods (Geertz, 1973; Ortner, 2006), which we describe in detail below. In total, our analysis draws on stories from 53 people who are directly involved with Growing Resilience.

We obtained Institutional Review Board approval for Growing Resilience and all qualitative research included therein prior to beginning this inquiry. Additionally, we sought and obtained approval for Growing Resilience research from both Eastern Shoshone and Northern Arapaho Tribal Business Councils. The Growing Resilience Community Advisory Board, consisting of Eastern Shoshone, Northern Arapaho, and other Sovereign Nation members, has provided guidance and approval for all aspects of this research from research question conceptualization to data collection to dissemination in this present form. We obtained written informed consent for qualitative research participation from participants during their initial quantitative health data collection, and

we reviewed consent with them again prior to participation in qualitative research.

We, the co-authors, consist of a White woman, who was an anthropology doctoral candidate at the time of data collection, Budowle; a Northern Arapaho man and research scientist, Arthur; and another White woman, who is the principal investigator of Growing Resilience, Porter. Budowle and Arthur led the development and implementation of this research with support and input from Porter. We have relied on our respective outsider and insider statuses in the WRR community, and we collaborated on gathering data, developing research questions, and analyzing and interpreting data. Our approach also reflects Arthur's commitment to research that honors and transmits ancestral and present-day Indigenous stories in WRR communities (Arthur & Porter, 2019; Bradley, Gregory, Armstrong, Arthur, & Porter, 2018). Accordingly, stories—which can promote both individual and community resilience in Indigenous contexts—provide our primary data source for the present research (Kirmayer et al., 2012).

Data Collection

While fieldnotes from participant observation inform our analysis in a general way (DeWalt & DeWalt, 2011; Sanjek, 1990), we rely primarily on two main sources of stories for more detailed analysis and coding: talking circles and a novel methodological approach we developed during the research process, which we call *sovereign storytelling*. Participation in talking circles and sovereign storytelling was optional and additional to participation in the overall Growing Resilience project and associated quantitative health data collection. Our purposive sample included any adult participant who was randomly assigned to the treatment, or gardening, condition (i.e., not a participant randomly assigned to the control condition who had not yet participated in gardening) and who wished to participate (Guest, 2015). We invited participants to join talking circles and share stories at health data collections, during gardening workshops, and through direct contact by phone. Only adult participants were eligible to formally participate in qualitative research; however, children frequently joined in and around sovereign storytelling informally, particularly during onsite garden visits, through photo stories, and by creating artwork-based stories with adult family members.

As suggested by the community advisory board, talking circles took the form of culturally responsive focus groups (Rodriguez, Schwartz, Lahman, & Geist, 2011). Accordingly, we observed locally appropriate customs for group discussion through talking circles, in which participants pass a talking stick and allow each person to talk uninterrupted while they hold the stick and until passing it to the next person who wishes to speak. A community elder made the talking sticks specifically for use in Growing Resilience qualitative research, and another elder blessed the talking sticks prior to use in our talking circles. We conducted two talking circles (N=14; N=11) totaling 25 participants. We also facilitated a talking circle with community advisory board members (N =6) who asked for an opportunity to share their stories about the project and gardening (Bowers, Harris, Harris, Lone Fight, & Weed, 2019). We prompted participants with a digital storytelling video focused on gardening in the WRR produced by a co-investigator at Blue Mountain Associates during the Food Dignity project (Potter, 2015).

After completing two participant talking circles, we implemented sovereign storytelling as a way to infuse participant choice and voice into our qualitative methodology, given that the colonizing process of research, including food justice research and CBPR, fails to provide the "means for research participants to shape or respond to how they are represented" (Bradley & Herrera, 2015, p. 104). Sovereign storytelling seeks to purposefully allow participants a say in that representation and to highlight Indigenous stories as an active way to contribute to the decolonization of research (Smith, 2012). We asked participants as individuals or families if and how they would like to tell their stories to us as researchers and if and how they would like to share those stories with the greater community in their own voices. Participants could opt to tell their story through single or multiple methods. All participants consented to sharing their stories for research, including as presented here. Some also opted to share their stories directly, including with the WRR community.

We provided a brief menu of potential storytelling methods to participants (although we invited participants to engage in storytelling methods other than those suggested in the menu):

- Participating in an interview, as an individual or as a family;
- Participating in a group talking circle;
- Talking informally about their garden during a home garden visit;
- Taking pictures of their garden and writing a bit about the photos in captions;
- Keeping a garden journal and sharing some or all entries;
- Making art about their garden (e.g., poem, story, sculpture, drawing, beading); and
- Making a short film about their garden.

In total, 22 participants engaged in storytelling, resulting in 15 unique stories, as several people opted to tell their stories as couples or families. Participants selected a variety of storytelling methods, including interviews, home garden visits, photos with captions, videos, and artwork.

Using a person-centered approach that allows for illumination from individual experience to the broader community and sociocultural context (Levy & Hollan, 2015), we asked participants two key questions for both talking circles and sovereign storytelling:

(1) What does the gardening experience provide/mean for you and your family?
(2) What does the gardening experience provide/mean for your community?

We generated verbatim transcripts of participants' stories from talking circles, interviews, garden visit conversations, videos, and photo captions. While not included in our coding scheme, which we detail below, holistic understandings of stories, artwork, photos, and fieldnotes from health data collections, garden visits, garden workshops, Growing Resilience open houses and celebrations, community advisory board meetings, and various planning meetings with Blue Mountain Associates and our academic research team more generally inform our analysis.

Data Analysis

After correcting transcripts, we used Dedoose software to aggregate and code our data (Dedoose, n.d.). We generated initial coding themes deductively, shaped by Growing Resilience research questions about mechanisms of health and wellbeing related to gardening (Bernard, 2006). Simultaneously, we used a grounded theory approach, allowing themes to emerge from the data (Glaser & Strauss, 1967; Strauss & Corbin, 1990). This combined deductive and inductive approach provided direction for our analysis while also allowing other important themes to emerge (Miles & Huberman, 1994). Along with our time in the field, this analysis prompted us to investigate generational and familial relationships. We each independently developed initial codes from our first talking circle transcript. Then we collaborated to refine our coding scheme as an academic research team before finally checking it with the community advisory board. The inclusive code-generation process provided validity and reliability according to standards for ethnographic research in our analysis (LeCompte & Schensul, 2012; Trotter, Schensul, & Kostick, 2015).

While Budowle and Arthur independently coded all data, Budowle served as the primary coder for this analysis. In this research, we employed a joint coding approach less as a means to quantitatively calculate interrater reliability, but more to use Arthur's codes and coding as a general check against Budowle's, given his deep familiarity with the research context. This approach is in keeping with the team-based methodology that we previously described and allowed us to focus on deep qualitative insights and the extension of community resilience and food sovereignty frameworks relevant to our grounded approach (Bernard, 2006; LeCompte & Schensul, 2012; Yin, 2009).

Our entire Growing Resilience qualitative inquiry examined broad mechanisms of resilience, health, and wellbeing associated with home gardening. After deductively coding for these mechanisms, we identified several codes potentially relevant to themes of family and generations. Passages identified with these codes represented 44% of our overall dataset. After removing passages coded as 'gardening practices,' which emerged as the most

frequent code in our overall dataset, wherein participants discussed actual or planned gardening in a highly technical or practical way, excerpts related to family and generations made up 66% of our coded passages. The prevalence of these codes in our overall dataset suggests that while participants discussed gardening practices, food, and health, they readily contextualized those discussions in terms of family and generations.

Accordingly, we specifically narrowed our scope in this research to family relationships, which we define as those relationships involving children, grandchildren, parents, grandparents, and other broad familial and generational relationships across time (as opposed to other social, nonfamilial relationships). This yielded a dataset of over 200 unique excerpts. After further analysis of these excerpts, the following intergenerational themes emerged, around which we organize the presentation of findings below: *family; togetherness; teaching and learning; parents, grandparents, and past generations; knowledge and traditions; historical trauma; perseverance and expansion; children and grandchildren; visons and hope;* and *shared knowledge and memory-making*. Finally, we checked the validity of our themes with other members of the Growing Resilience team (Glaser & Strauss, 1967).

Results

We use an analytical framework of *present*, *past*, *future,* and *cross-generational* to organize the above themes. These frames serve as linguistic representations of time that allow us to locate social meaning within their bounds (Goffman, 1974), even though, as we discuss below, a cyclical representation of these frames may be more fitting for an Indigenous concept of time.

Present

Participants most frequently described their garden experiences through present familial relationships and practices, including themes of *family; togetherness; and teaching and learning.*

Family

Gardeners often described their present experience with family in general ways. Within Growing Resilience, households frequently consisting of multiple generations participated in the garden and health data collection together, and the family experience was a focus for the study and for participants. Many discussed their gardening experience in relation to not only the family members participating in the project, but also to those not participating and to extended family members. One participant described her eagerness to support her father with gardening as a key reason for participating in the project: "Because my dad always talked about 'oh we need to get a garden,' so I was like, okay, this is our chance. I'm going to get him involved."

While participants generally talked about their entire families, including parents and siblings, they heavily focused on their children and grandchildren in relation to their gardens. Many described how children helped with various stages of gardening from planting to harvest and took ownership over specific tasks within the garden. Participants additionally made connections between children and the growing process, for example:

> They're interested in something that you grew, and you're trying to tell them that you're growing it for them. That's what you want: to try to just grow stuff for them, try to get their own little garden growing for them.

> Growing it, and if you got kids, it's the same way—you're growing them up too.

Notably, the design of the pilot version of Growing Resilience included only adults in the health data gathering portion of the project. However, the participating families and advisory group at the time said it was imperative to include children not only in the gardening, but also the health data gathering in the full-scale project. Similarly, children were a focus for community advisory board members, many of whom garden and some of whom participated in pilot iterations of the study. They described healthy families as a primary motivation for serving on the board and noted family benefits as a gardening outcome:

> And I see their light. Their whole families light up. I mean their kids, you wouldn't

> think young kids would get into it, but they do get into it.
>
> The kids see the sprouts coming up, and it's so exciting to them to know that these are growing. Then when they can pick it, you tell them "go get me two squash out of the garden," and they'll run out and bring them in, "we found them, we found them!" And they watch to see—it's something, it's life. I think that the families that are involved will continue.

Togetherness

Many participants talked about how gardening brought their families together in the present, involving their children in something positive and often resulting in a sense of accomplishment and pride. Participants noted strengthened relationships, including spousal, parent-child, and across the family, for example:

> I have eight children and my husband here, and we really love the garden. It helped us as a family, to come together. . . . I think it really helped me with the bonding with the children and with my husband. And, it meant a lot to us as a family.
>
> My kids didn't know before this year of us having our own garden, so I was really proud that they were right there with me, hands on doing it, getting dirty, and not even complaining. Usually they notoriously complain, but this time they actually really looked forward to it. And, it made me really proud that they wanted to know how to grow their own food.
>
> It makes us all really excited together, to see that we've done this together. Especially when we get something like the zucchini, and it's like, "look we did it; we've scored!" It's something we all did together, and it's for us.

One participant noted the potential for gardens to strengthen family relationships for other people:

> If more people got a garden, it'd be better for their families, because they're all involved in it. My kids really enjoy it. My little guy, he finally got to where he could start getting involved this summer. . . . I think if people get their children involved, then it will stop on some of the violence later on, because they're more involved with what's going on at home than what's going on out here.

Bringing families together through gardening similarly emerged for the community advisory board:

> It's really been a pleasure to see how much it's helped our community and the people who are actually growing it, because it brings your family together. That's your livelihood—a long time ago if you didn't have a garden, you didn't eat. But, they're not seeing it that like that; it's more bringing their families together, everybody working together.

A co-investigator with Blue Mountain Associates reported that a participant thanked her for supporting her garden and bringing the family together. The participant shared that instead of sitting inside all doing different things, her family now sits outside by the garden, watching the sun set while talking and answering the children's questions.

Teaching and learning

Many participants described the garden as a mechanism for them to teach their families and for children to learn, for example:

> It's awesome, because now I've learned so much—he's learned a ton—and now we can teach our kids. I taught my daughter-in-law. She had a little garden at their place this year. . . . It's kind of a together thing. It brings everybody together, because I can bring someone out and "look what I learned today!" and then I teach them to do it, and now everybody knows. And then

> everybody's excited when stuff comes from the garden, and we get to eat it.

One married couple explicitly connected their children's time in the garden to learning healthy eating and cooking skills. They described how harvesting from the garden reminded them that food does not have to come from a store, which "opened our kids' eyes too." They attributed their children's recently diminished food aversions to the garden, explaining that "getting them involved and actually feeding them the food that we're getting kind of opened, broadened their horizons of food." With their son learning to cook food from the garden, despite having never demonstrated interest in cooking previously, his mother hoped cooking "will take him somewhere, eventually."

Beyond gardening and food knowledge, participants described how the garden facilitated learning around responsibility, self-reliance, and empowerment for themselves and their families:

> It may be a chore, but one day they'll realize that this thing needs its nourishment too, and they got to give their time to this garden, so it'll grow. And, it takes patience and time; it's not just something you could hope it'll live on its own, or, "it'll be okay, it was really hot today. I'll just worry about it tomorrow," and then say that the next day and the next day. It takes your time and attention every day. You have to put effort into it to get it going. And, they're learning that.

> It's instilling in our kids, showing them that we're able to do this ourselves instead of relying on the stores for their produce and waiting. And teaching them, empowering them that really, they're able to grow their own food.

> I think it's been a really good experience, because not a lot of people know how to grow stuff. It's easier just going to the grocery store. One of the essential things about life is growing stuff. If you can grow a garden, you can do almost anything.

Past

Participants connected their current experience to gardening in the past. *Parents, grandparents, and past generations; knowledge and traditions;* and *historical trauma* themes are organized within the *past* frame.

Parents, grandparents, and past generations

Many participants recalled that their families—particularly parents and grandparents—maintained gardens in the past, often out of necessity. One participant noted that his mother's large garden took time to establish, but she was able to improve it over time to grow large quantities of food, including corn. He explained, "she grew up really poor right over here just on the river, and they grew their own stuff." Others described parents and grandparents who canned and preserved food from large gardens to last throughout the year. Some even recalled gardening or eating from the garden as children:

> When I was growing up my folks had a big old huge garden, and we never went to town, bought candy or anything. When we got hungry, we'd just run out to the garden and get us a turnip or carrots. Then we'd take off again. We'd go cruising wherever we were going, go back to the river to swim or horseback. We always had something to do. But our garden—we just raided in our garden all the time; it was good. We had lots of corn and these types of food at the table. And my grandmother had a huge old garden. My aunt and I used to have to always be hoeing it and watering it.

Some participants and members of the community advisory board recalled a more comprehensive use of gardens in the WRR and generations past. One remembered that the entire community kept large gardens and used cellars to store food over winters. A participant noted that the act of gardening today is explicitly connected with practices in the past:

> Basically, planting them, and they do the same thing they did a long time ago. They still put the seed in the ground, took care

> of it, nourished it, and give it the love it does, and it'll come up the way it needs to. And it connects by just that feeling of taking care of it, and when you do get all the vegetables and stuff from it and you can benefit from it.

Knowledge and traditions

Beyond specifically recalling family members and past generations who gardened, participants described past knowledge and traditions involved with gardening and food. Participants frequently described gaps in past knowledge and skills as an obstacle to their current gardening. A couple explained how, despite their lingering interest, their family had stopped gardening as a result of their grandmother's death and that most family gardening knowledge and commitment largely died along with her. Another participant described knowledge as "dormant" and noted that their family relied on living grandparents to access gardening knowledge from the past. One participant explained how challenging gardening was due in part to gaps in generational knowledge: "It was really hard for us to know how to do a garden. We've never done that before in our lives. We have moms that know how to do them very well, but we didn't know how."

While participants noted the challenges with knowledge gaps, many expressed a desire to reclaim lost skills and traditions relevant to gardening and food preservation from earlier in life and previous generations for themselves and the broader community today:

> I think it's a good experience. People are getting back to ground roots, stuff we grew up on when we were young. I learned how to plant and maintain a garden and take the veggies out and use them.

> I never knew how to go to the grocery store growing up. We ate everything canned. And now, I'm trying to learn how to do all that stuff after all these years. It is a lot healthier. People were healthier back then. My grandmother lived to be 95, and I think puttering in the dirt was probably the best thing. And I found out that when I have a lot of stress, I go putter in the dirt, and that actually, puttering today might be a good idea.

> I've seen some people that have maybe had a garden before, but it just kind of went away, by the wayside. Why can't you build it back up?

Historical trauma

Some participants and community advisory board members explained the loss of gardening from previous generations in terms of long generational processes of historical trauma leading to present outcomes. A participant equated pervasive drug and alcohol use in the WRR with gardening fading over time. For that reason, he wished he had an opportunity to garden earlier in life: "I wish that was started a long time ago, when I was a little guy. I would've been already doing this."

Others made explicit connections between boarding schools and the loss of gardening—and the need, as noted above, to reclaim lost gardening and food preservation skills:

> There's a lot of information that actually goes into growing a garden, and this is actually stuff that can start being passed on. I know in our family we haven't really gardened since grandma and mom, and that was boarding school era. So, it skipped what, two generations? Now, we're slowing picking it back up again.

One community advisory board member hoped that the project "planted the seed of healthy living" in response to drugs and alcohol, particularly for young people in the WRR. Making an explicit connection to historical trauma, she wondered, "I don't know how we're ever going to break that. I know it goes back, way back, generations and generations when it started with the boarding school. And we're still living that trauma, although we say so much, 'well what is that?' We don't realize that's still affecting our lives today, and you wonder: how are we ever going to break that?"

Future

Most participants framed their current gardening experiences with an orientation toward the future, both for themselves and their families in the near and long term. The *future* frame includes themes of *perseverance and expansion; children and grandchildren;* and *visions and hope.*

Perseverance and expansion

Many participants spoke about continuing to garden for themselves and their families in a practical way in the near term. Even if their garden attempt had presented challenges, most participants demonstrated perseverance and plans to overcome challenges in upcoming seasons. In a narrated video of the extensive grasshopper damage in her garden, one participant stated, "this year is not good, that's for sure, but all I can do is keep going." Another participant, whose mother's death largely prevented her from gardening altogether, described plans for a larger garden and experimenting with different crops for her family in the near future, saying, "I want to try an apple tree. My grandson wants an apple tree, so I'm going to try that and see what happens."

Participants who enjoyed more successful gardens also spoke of plans for the near future and upcoming gardening season. Numerous participants expressed a desire to expand their gardening skills and knowledge, asking for more information ranging from troubleshooting to food preservation. A couple explained the importance to their family of "learning from your mistakes" in order to plan ahead for different approaches to gardening. In addition to new techniques, many successful gardeners spoke about expanding the size of the garden for their families.

Children and grandchildren

Much like their focus on family, specifically children and grandchildren, in the present, participants discussed how the garden prepared their children and grandchildren for wellbeing in the future. Many extended their future thinking in terms of ideals for their children and grandchildren throughout their lives and into adulthood with a longer-term future orientation than the immediate plans above, for example:

> Showing my kids how to take care of it and letting them grow up to do the same thing.
>
> That way they know when they grow up, this is what you've got to do. And, if you want the vegetables, you plant them, watch them, take care of them, feed them.
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> Learning to eat healthy and the way we were meant to eat, rather than junk food, McDonald's, Pizza Hut, and all that. We try to eat a lot of vegetables. And it'd be more meaningful for my girls to know how to grow them, so that way they know how to do it when they're older. Everything I teach them, I want them to hold on to and know when they're older, when I'm gone.

Visions and hope

Additionally, participants adopted a broader future orientation focused on visions, hopes, and plans for their gardens, families, and entire people often in direct response to family, food system, and greater societal challenges. One participant discussed her garden in the context of wanting to retire if her adult children would take responsibility for their own children, the grandchildren currently in her care:

> These little girls, their mother is always gone. I can't go anywhere without them, they'll just, "grandma, where you going?" I try to sneak out the door, and they beat me out the other. If the parents are responsible, I'd like to retire. I'd like to do a big old garden. I want to do flowerbeds.

Another participant explained that his parents had previously farmed grains and, "as we got older, it just kind of went out of style." His hopes for the future centered primarily on his own children, but also his parents' wellbeing: "It would be nice to see them pick it back up, because then it would help them emotionally and physically, actually."

We asked community advisory board members about their visions and hopes for the future both within Growing Resilience and once the project ends. They described more immediate hopes for

the board and project itself, but most of them extended their hopes into a broader future for their community and people going forward, much like participants did for their own families:

> My hope and vision for this is that there can be better education and awareness getting out there to the younger kids about what processed food is doing to us. I just want that to be a great concern for us as people, for us to be here a long time and to continue our legacy of what we're supposed to be doing.

Cross-Generational

Participants explained the gardening experience beyond discrete time-based frames and across more than one generation within their overall stories and even within a single excerpt. For example:

> It's just important for my kids, for my family. Because my dad had diabetes, my grandma and grandpa. I don't want my kids to have that. I don't want to have that. I want to actually be able to eat healthy and make sure my family eats healthy.

> My daughter and I do the garden together with my grandkids, and I think that's like what [other participant] was saying: that the most important thing is to pass that on to our families. My grandmother and my great grandmother would also garden in [home state], and my mother had a huge garden.

> Participant: "I mean this garden is, for me, it's to carry on the tradition, especially when my dad's not here. He's the one, he's our leader right now."

> Interviewer: "[Your dad] was saying he remembers his parents and grandparents gardening corn."

> Participant: "Yep, and when we used to live on [street name], we had a garden there, and we'd go along and plant. That was always our family thing. That's what I want to make for my kids to carry on and know what you got to do. It takes work, but it can be done, and take pride in our land and our seeds and growing here in the nice sunshine."

Shared knowledge and memory-making

In addition to describing the gardening experience across multiple generations, participants talked about the transmission of knowledge and the active production of memories across generations and time. One participant explained drawing on memories of her mother to develop present-day gardening skills:

> She had a couple gardens when I was younger. She was always planting something, actually. She wouldn't say, "come here," but I was just watching her all the time, and I mostly learned from watching. I just remember the things she would do. And then when I would come across these problems, I'd wonder, "what would she think about this or do about this?" And, it really helped a lot trying to get through growing stuff.

Many participants described gardens as explicitly meeting a need for present and future self-reliance, equating those same practices to traditions in the past. One participant thoroughly articulated this concept by connecting his garden to generations past and an unforeseen future:

> I'm always thinking about these types of things, because I grew up, my grandma and my grandpa they used to talk a lot about what the old people say. In the future, this is what's going to happen, foretelling, to prepare yourself. For one, it was preparation as a boy to be a man, this is what a man does, this is how you do it, this is the way that you're supposed to think about it. And then they also tell you, you've got to learn how to do these things, because one day you're going to need it. You better learn how to eat prairie dog; you better learn how to cook it. One day that might be the only

> thing you have. Learn now how to eat rock. You better learn how to catch fish and cook it. You better learn how to cut your meat, because one day that's the only thing you're going to have to rely on. And one of the things they talked about too, they said one of these days there's going to be a time when, they talked about a war or some kind of a tragedy, some people think they're talking about nuclear holocaust. They're saying you're going to have to rely on yourself and your skills and your knowledge. And to me, learning how to grow is not that simple as putting the seed in the ground and water it. How much water? How deep should you plant that seed? What kind of dirt?

Finally, participants described their gardens as a means to make memories for themselves and for their families into the future. One participant explained how she wanted to reconnect her cousin with gardening as a way to help her remember her deceased mother who had previously gardened. Many participants hoped to make memories for their grandchildren in the future, including by connecting back to memories of their own grandparents:

> I, too, grew up where my grandmother had a garden, and I would be out there working in it, just like my grandkids did too. I really enjoyed that. I mean it's peaceful. We would both would sit out there, had a bench out there, and they'd come sit out there with me. I look forward to making more memories in my garden.

> I had a really good experience this past summer with gardening. And, it really made some good memories for my grandbabies. I think that's the biggest reason I decided to do gardening. . . . It really makes me good memories, and I think that's what I want to leave my grandbabies with is memories, so they can instill that in their kids and carry it on.

Discussion

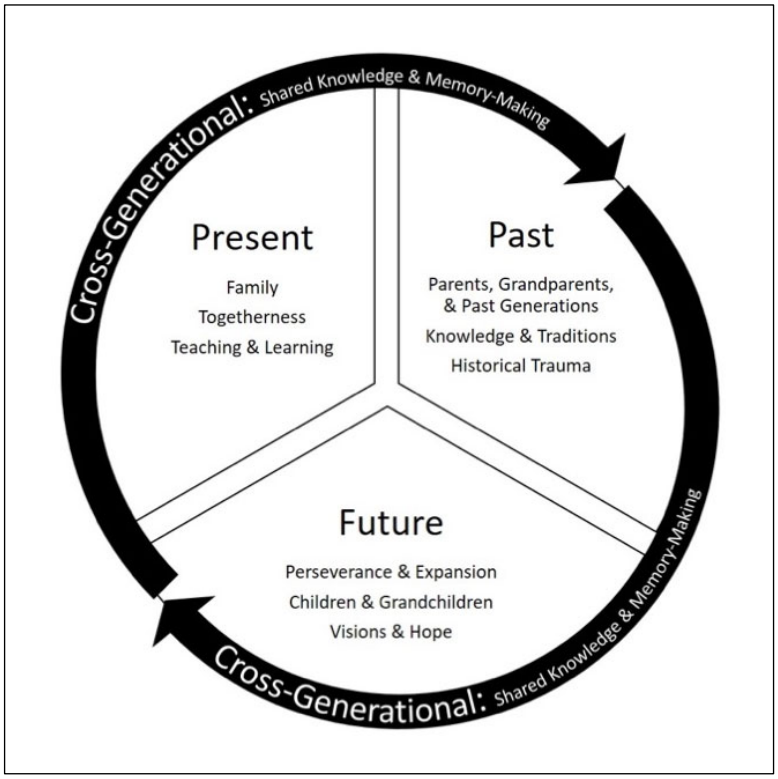
Participants consistently contextualized their gardening experience, including health, wellbeing, and food, within family and generational relationships and shared knowledge, practices, and memories. They explained gardening in the present in terms of outcomes for their families, especially children and grandchildren, and how gardens facilitate family teaching and learning, and togetherness. Through making connections to generations in the past, participants recalled parents and grandparents who gardened and aimed to reclaim past knowledge and traditions despite historical trauma. Participants demonstrated a future orientation, explaining immediate plans to persevere and expand for themselves and their families even despite challenges, a longer-term focus on the wellbeing gardening could provide for their children and grandchildren, and visions of hope for their families and people. Finally, participants connected their gardens across multiple generations, drawing on past, present, and future family relationships at once, including how gardens facilitated shared knowledge and memory-making. Taken together, we suggest that these connections compose what we call *intergenerational resilience.*

We present the themes above according to largely chronological concepts of present, past, and future, along with the cross-generational ways participants described their family relationships. Northern Arapaho people who live in the WRR, for example, have broadly adopted these Euro-American concepts of time throughout the process of colonization. Anderson (2011) , however, notes that colonization contributed to "dissolving the densely intergenerationally ordered time-space of pre-reservation life" (p. 253). Though our frames follow a Western, linear presentation of time, Figure 1 presents a more culturally appropriate representation of intergenerational resilience, following Arthur and Porter's (2019) work on re-storying Northern Arapaho food sovereignty with a cyclical paradigm of time.

The saliency with which participants explained their gardening experiences in terms of family in the present—particularly children and grandchildren—was striking. Their focus on teaching and learning and togetherness indicate that they use

Figure 1. Intergenerational Resilience

A cyclical representation of time-based and cross-generational frames, which organize familial and generational themes from participants' stories.



home gardening not only to produce food and develop practical skills, but also to facilitate important relationships and processes that have little to do with gardening itself. Like the kincentric ecology that undergirds Indigenous food sovereignty, gardens are just one part of an interconnected web of relationships between family members and their environment (Coté, 2016; Salmón, 2000). These findings add a distinctly familial and intergenerational dimension to the characteristics of social networks and knowledge, skills, and learning in community resilience frameworks (Berkes & Ross, 2013).

Participants' discussions of gaps in past cultural and family gardening knowledge suggest that they understand gardening in Growing Resilience as a resilient response to the colonization and genocide that systematically diminished food sovereignty for people in the WRR (Arthur & Porter, 2019). Furthermore, participants drew on past trauma to explain present barriers to gardening for themselves, their families, and their people, which is consistent with understanding trauma as ongoing structural violence (Kirmayer et al., 2014). Relevant to the connection between resilience and food sovereignty, Walsh-Dilley et al. (2016) remind us that "to build resilience in a particular context, we cannot just look forward but must also look back to understand what social structures and relations of power have created contemporary outcomes" (para 27).

Yet participants readily focused on a resilient reclamation of knowledge and skills from the past, indicative of the process of decolonization and connections to self-determined food practices central to Indigenous food sovereignty (Coté, 2016; Grey & Patel, 2015). One participant's ability to explicitly relate nourishing plants today to providing a feeling of connection to past generations harkens to another aspect of Indigenous food sovereignty encapsulated in the Cree's miyupimaatisiium notion of being alive well, which connects to "a rich and complex past" (Adelson, 2000, p. 25), in addition to relationships with the environment. Community resilience frameworks similarly acknowledge that collective memory constructs understandings of the past in a way that can support resilience in the present (Harms, 2012; Vaneeckhaute et al., 2017).

Gardeners expressed the desire to persevere and expand in the near term despite family and environmental challenges, including as a pathway toward wellbeing for children and grandchildren over the longer term. Particularly in Indigenous communities, resilience requires this kind of strength in spite of adversity (Kirmayer et al., 2012). Hopes and visions for a broader future demonstrate that same strength and connect with the foresight and future-orientation key to social-ecological resilience (Westley, Carpenter, Brock, Holling, & Gunderson, 2002). People's hopes for the future can inform how they direct their present and near-term practices for resilience (Baptista,

2014; Persoon & van Est, 2000).

The themes in the cross-generational frame demonstrate the importance of interconnected relationships supported through a living garden environment across present, past, and future family generations at once. While teaching, learning, and knowledge appear in all frames, the cross-generational frame suggests that the transmission of memories and knowledge is an active process within families. This parallels the O-Pipon-Na-Piwin Cree stories that connect past, present, and a future wherein food "is a source of cultural strength," which "as *wechihituwin,* represents more than sustenance, it contains stories and memories that can heal the community" (Kamal et al., 2015, p. 570; italics in original). Similarly, we find that gardens provide more than health promotion or reclamation of autonomy over food production (Porter, 2018a; 2018b); gardening can facilitate connections to past, present, and future generations at once. This vibrant approach to generational time is dynamic rather than freezing, erasing, or othering Indigenous people as relics of the past (Fabian, 1983). It draws on relationships across the past and present to inform a more hopeful, relational, and resilient future.

Our findings suggest that gardening facilitates the generational transmission of resilience for Growing Resilience families, which is significant in three main ways. First, intergenerational resilience extends beyond the direct historical trauma response (see Atallah, 2017; Denham, 2008) and applies to home gardening as an Indigenous food sovereignty practice in the WRR. The effects of colonization and genocide are ever-present, including in the food system (Arthur & Porter, 2019; Coté, 2016; Grey & Patel, 2015). Gardens, however, provide space and capacity for families to reinforce their relationships across time in a present context less directly connected with historical trauma (Lester, 2013). Second, we empirically extend the dimensions of intergenerational resilience through the specific ways in which participants draw on relationships and knowledge across the present, past, future, and cross-generationally through gardening to inform resilient practices.

Third, we begin to introduce intergenerational resilience to community resilience frameworks, which has relevance for application in movements for Indigenous food sovereignty. We provide evidence for a dynamic, intergenerational dimension to key community resilience characteristics of people-place relationships; social networks; and knowledge, skills, and learning (Berkes & Ross, 2013) through gardening in the WRR. We conceptualize intergenerational resilience not as a counter-framework to existing community resilience frameworks; rather, it provides a culturally specific dimension of community resilience that is particularly resonant for Indigenous food sovereignty, for which universalized models cannot do justice.

Anthropological concepts of *cultural* resilience are also relevant to understanding the cultural specificity that intergenerational resilience provides. Providing a working definition, Bollig (2014) suggests that cultural resilience is "a set of contextually relative attributes (thoughts, behaviours, knowledges, resources) that intersect across different social networks, scales and institutions within lifetimes, across generations and through historical time" (p. 276). Incorporating generations and historical time pushes community resilience beyond social and ecological networks and processes to a more dynamic, longer-term conceptualization of relationships and culture relevant in Indigenous contexts. As Middleton's (2010) work with Maidu people demonstrated for political ecology perspectives, social-ecological community resilience approaches can better support Indigenous people by recognizing the centrality of intergenerational trauma—and as we suggest, of intergenerational resilience.

Given the relational kincentric ecologies relevant to other Indigenous food sovereignty efforts (Salmón, 2000), intergenerational resilience could serve as a focal characteristic of social-ecological community resilience approaches in these contexts. In Indigenous food sovereignty efforts, intentionally integrating family into practical strategies of growing, preparing, and sharing food may help people make even more of these practices by generating intergenerational resilience. Sharing family stories of intergenerational relationships, knowledge, memories, and hope may further contribute to resilience development in food sovereignty efforts. In contexts with strong family networks,

such as the WRR, CBPR approaches to food sovereignty collaborations with community-based partners should help ensure this approach, drawing the family into sharper analytical focus by helping to shape interventions around the family across generations.

Conclusion

Families participating in Growing Resilience fostered intergenerational resilience through gardening. We conceptualize this intergenerational resilience not as counter to existing resilience perspectives, but as a culturally specific characteristic or mechanism of community resilience. In this case, the generational transmission of resilience extends beyond the immediate historical trauma response and is particularly applicable to Indigenous food sovereignty. Intergenerational resilience is a strength that Indigenous people and communities may draw and build upon, including in the face of historical trauma.

Community resilience and Indigenous food sovereignty approaches, however, may vary across contexts due to a wide range of Indigenous cultures and also the different effects of colonization and power in unique places (Kamal et al., 2015; Walsh-Dilley et al., 2016). Accordingly, future research should examine if and how intergenerational resilience is relevant in other Indigenous contexts and food sovereignty efforts. Cross-cultural comparisons to non-Indigenous contexts could also provide a better understanding of the role of family across generations in related community resilience and food justice practices. Finally, based on preliminary findings from our data, other social relationships among friends, colleagues, community-based organizations, and broader community structures emerged as important, though they were mentioned less frequently than generational family relationships. Future CBPR in WRR will build on these findings to investigate the importance of family relationships relative to and in concert with other social relationships for health, resilience, and food sovereignty.

In sum, families engaged in the community resilience and food sovereignty practice of home gardening through Growing Resilience fostered and drew strength through intergenerational resilience based not only in relationships and knowledge in the present, but also connections to past and future generations, and even across many generations at once. By focusing on these relationships, gardens and other Indigenous food sovereignty practices may grow resilience more intentionally both for the present and for generations to come.

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Abstract

A long history of tribal disenfranchisement through government policies has contributed to a lack of trust and participation by tribal communities in nontribal organizations and initiatives. This article will discuss the process through which new partnerships were forged using a community-based participatory research (CBPR) approach among university researchers, local nontribal organizations, and three Tribes in the Klamath River Basin of southern Oregon and northern California through a five-year federal food security grant. The partnership's shared goal was to enhance tribal health and food security and food sovereignty in the Klamath River Basin by building a healthy, sustainable, and culturally relevant food system. We describe the context that gave rise to this collaborative partnership; share reflections on how project

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goals, objectives, and activities were co-created, adapted, and implemented; and highlight specific examples of research, education, and extension activities, informed by CBPR, that support the tribal goals of strengthening Indigenous food sovereignty. We also share lessons learned from navigating unforeseen challenges in ways that we hope can provide insight for scholars, cooperative extension advisors, nonprofit organizations, and government agencies seeking to build effective partnerships with tribes working toward food system change in Native American communities.

Keywords
Native American, Food Security, Native Foods, Food Sovereignty, Indigenous Knowledge, Karuk Tribe, Yurok Tribe, Klamath Tribes, Traditional Ecological Knowledge, Community-Based Participatory Research

Introduction

> Our food not only nourishes our hearts, minds, bodies and spirits, it keeps us connected to our culture. To know a culture is to know the food. In the words of Winona LaDuke, "Our people can't recover until we recover our foods."
>
> —Perri McDaniel, Klamath Tribes Food Security Coordinator

Native American communities across the United States are experiencing some of the highest rates of poverty, food insecurity, and diet-related diseases in the country (Jernigan, Hyser, Valdes, & Simonds, 2017; Tomayko et al., 2017). Research has only recently begun to unveil the devastating and enduring impact of settler colonial policies enacted by the U.S. government against Indigenous people, including forced removal from the land, cultural assimilation, and mismanagement of Native ancestral lands, and their effects on the health and well-being of Native peoples (Hoover, 2017; Norgaard, 2014; Sowerwine, Mucioki, Sarna-Wojcicki, & Hillman, 2019; Turner & Turner, 2008). This long history of tribal disenfranchisement through government policies has contributed to a lack of trust and participation by tribal communities in nontribal organizations and initiatives. Many Native people seeking to revitalize their food systems consider restoration of traditional foods and practices essential to regaining their health, traditional economy and culture (Bell Sheeter, 2004; Conti, 2006; Jack, 1916). Yet challenges remain, due to limited funding and tribal capacity, gaps in knowledge caused by genocide, forced assimilation and associated historical trauma, limited access to ancestral tribal lands, and the inherent institutional power asymmetries shaping resource access, use, and management.

The Klamath River Basin of Oregon and California, with its Indigenous peoples—the Karuk, Yurok, and Klamath Tribes—is no exception. In 2007, a group of researchers from the University of California at Berkeley (UC Berkeley) and Karuk Tribal leaders and allies founded the Karuk-UC Berkeley Collaborative (2019) with the goal of building connections between the Karuk Tribe and UC Berkeley to support tribal-led eco-cultural revitalization initiatives. After several years of learning and discussion, in 2012 a team of researchers, the three tribes, a local nonprofit, the U. S. Forest Service, and the University of California Cooperative Extension came together with a shared vision to leverage the strengths of both Indigenous and Western science to conduct research, education, and extension to restore Native foodways in the Klamath Basin.[1] With funding from the U.S. Department of Agriculture (USDA) Agriculture and Food Research Initiative (AFRI) Food Security Program, the team embarked on a five-year, US$4 million collaborative research, education, and extension project, titled "Enhancing tribal health and food security in the Klamath River Basin by building a sustainable regional food system."

The overarching goal of the project was to create a more sustainable food system in the

[1] The PIs included UC Berkeley, the Karuk Tribe, the Yurok and Klamath Tribes, Mid-Klamath Watershed Council, and UC Cooperative Extension Humboldt/Del Norte Counties. Additional collaborators included the U.S. Forest Service, UC Davis, and College of the Redwoods.

Klamath River Basin, resulting in healthier communities, ecosystems, and economies among the Klamath, Karuk, and Yurok Tribes spanning from the town of Klamath near the Pacific Ocean in Northern California to the towns of Chiloquin and Klamath Falls in South Central Oregon. Project goals and objectives were identified through in-person community and partner meetings and phone calls over the course of a year leading up to the grant application, and traditional food revitalization emerged as a priority—central to decolonization, ecosystem management, community health, cultural identity, and youth empowerment. Through its focus on Native/traditional foods,[2] this project sheds light on specific food security concerns unique to the Klamath Basin Native American community, including access to, availability and consumption of native foods, and the knowledge, relationships and cultural stewardship practices that sustain them. It is important to note that while we frame our project around the concept of food security, in order to be in conversation with and evaluate the efficacy of national models for assessing and responding to Native American food insecurity, our work is motivated by and rooted within an Indigenous food sovereignty framework. Indigenous food sovereignty, "refers to a re-connection to land-based food and political systems" (Martens, Cidro, Hart, & McLachan, 2016, p. 18) and seeks to uphold "sacred responsibilities to nurture healthy, interdependent relationships with the land, plants, and animals that provide us with our food" (Morrison, 2011, p. 100).

Using a community-based participatory approach (CBPR), this project sought to (1) assess the historical and existing food systems within the Klamath basin, including traditional, contemporary and commodity food systems, from production and land management through consumption, with particular emphasis on policy barriers and enablers of a healthy food system; and (2) build capacity of local partners and community members through education, extension, and local and tribal-designed projects. Forty-three research, education, extension/outreach, and management objectives were developed, which ranged from research on traditional foods and Native food security to youth camps, traditional food workshops, food-related skill building, and the creation of a regional food security library, tribal herbaria, and tribal kindergarten through twelfth grade (K-12) curriculum. In this article, we provide an overview of the principles and approach that guide our collaboration, followed by a discussion of several key aspects of our project that illustrate how to translate such principles into action, including the development of tribal research protocols and intellectual property (IP) rights documents; the integration of native foods into a community food security assessment across the Klamath River Basin; the intersection of Indigenous knowledge (IK) and Western science in native food and fire ecology research; the creation of a Native food system curriculum; the establishment of tribal herbaria, repositories of culturally important plants for education and research; the founding of the Píkyav Field Institute, a tribal-led research, education, and workforce development institute; and the integration of cultural values into extension through workshops and seasonal food camps. These examples provides insight into various strategies for revitalizing and protecting Indigenous knowledge, plants, and landscapes, integrating cultural values into community food security research and extension, and strengthening institutional capacity for ongoing food security and food sovereignty work beyond the end of the grant.

Engaging tribes centrally in the design, implementation, and evaluation of the food security project strengthened project relationships, impacts, sustainability of programs, and tribal self-determination. Yet it was not without challenges. We describe the context which gave rise to this collaborative partnership, share reflections on how

[2] In the literature, traditional and Native foods are often used interchangeably. For the purposes of this article, we refer to cultural foods that are party of an Indigenous community's food heritage as Native foods. We intentionally capitalize Native and Indigenous throughout the paper when it refers to a particular people in the same way that African American and other ethnic labels are capitalized. When referring to the plants and animals that compose the foods themselves, we do not capitalize in that case, as in native foods security, or the state of having access at all times to the plants and animals that compose a "traditional" diet.

project goals, objectives, and activities were co-created, adapted and implemented, and highlight specific examples of research, education, and extension activities, informed by CBPR, that support tribal goals of strengthening Indigenous food sovereignty. We also share some of the challenges and lessons learned that we hope can provide insight for scholars, Cooperative Extension advisors, nonprofit organizations, and government agencies seeking to build effective partnerships with Tribes working toward positive food system change in Native American communities.

Background and Context

The Klamath River Basin is home to some of the largest tribes in California and Oregon.[3] Until relatively recently, the Karuk, Yurok, and Klamath Tribes had access to some of the richest natural resources of any tribes in the northwest U.S. (Chiu, 2008), with an abundance of nutritious, traditional foods such as salmon, deer, elk, acorns, mushrooms, and berries that were consumed fresh and dried, smoked, and canned, and that were shared with families up and down the river (Bell, 1991; Davis & Hendryx, 1991; Salter, 2003). As Euro-American immigrants arrived in the Klamath Basin, homestead gardens also became an important source of fresh vegetables and fruits.

Today, however, the entire region is classified as a food desert (U.S. Department of Agriculture, 2017).[4] Tribal populations and rural communities in the Klamath are among the poorest and most food insecure in the country (Jernigan, Garroutte, Krantz, & Buchwald, 2013; O'Donnell-King & Newell-Ching, 2017; Sowerwine et al., 2019; Stubblefield, Steinberg, Ollar, Ybarra, & Steward, 2011; Subramanian, 2011). Many once-vibrant orchards and home gardens have been all but abandoned, and grocery stores are few and far between. Farms in the Mid-Klamath region export most of their produce to the urban core, while community members, especially elders and the structurally poor, remain hungry. Our recent study found that nearly 92% of Native American households in the Basin suffer from some level of food insecurity, and over half experience very low food security (e.g., reducing size of meals and skipping meals) (Sowerwine et al., 2019). These numbers represent much higher rates of food insecurity among Native American populations compared with the national average (12%), and more than ten times the national rate of *very low* food security. Similarly, the poverty rate among Native American households in the Basin (42.74%) is three times the national average (Sowerwine et al., 2019).

Dramatic changes to the Klamath River basin and its forests and fisheries under settler colonialism, including hydraulic mining, clear-cut logging and fire suppression, constructing seven hydroelectric dams, commercial fishing, and extensive irrigated farming in the Upper Klamath have pushed salmon numbers to near extinction and altered regional ecosystems, depriving tribal members access to culturally important traditional foods. Post–World War II logging and the expansion of private and government ownership in the watershed drastically reduced traditional stewardship of forested landscapes for foods (Anderson, 2005; Chiu, 2008). State- sanctioned genocide in the late 1800s (Madley, 2016), followed by years of forced cultural assimilation, have further disrupted traditional food systems.

Traditional diets, once dependent on physical activities related to hunting and gathering, were replaced by a modern diet of highly processed, low-fiber commodity and store-bought foods, and a decrease in physical activity (Anderson, 2007; Bell-Sheeter, 2004; Grant, 2001; Mucioki, Sowerwine, & Sarna-Wojcicki, 2018; NRCS, 2011). Tribal members today have some of the highest rates in the U.S. of diabetes and other diet-related diseases (Jackson, 2005; Karuk Tribe, 2010; Norgaard, 2004; Subramanian, 2011), consistent with studies that show that decreased consumption of traditional foods is related to increased rates of diabetes and other diet-related diseases in Native Americans (Conti, 2006; Kuhnlein, Receveur, Soueida, & Egeland, 2004).

[3] Current tribal enrollment numbers for tribes that participated in the project are Karuk, 3,626; Yurok, 5,706; Klamath Tribes, 3,700.
[4] The USDA Economic Research Service created what was then called the Food Desert Locator, which has recently been changed and updated and is now called The Food Access Research Atlas (USDA, 2017a).

Despite these challenges, tribes in the Klamath Basin have retained much of the wisdom and practices associated with traditional food gathering and traditional land management, such as prescribed burning, that have sustained their populations and spiritual connection to the world around them for thousands of years. This tribal food security project sought to help our tribal partners revitalize these traditions and contribute to the growing body of knowledge on the role of prescribed fire management in enhancing the productivity of native foods and fibers while reducing catastrophic wildfires and associated hazards to human health (Lake et al., 2017). Efforts to understand the ecological processes that underlie Indigenous management of traditional resources sought to help bridge the gap between traditional ecological knowledge and Western science, increase the availability of nutritious traditional foods to Native groups (e.g., acorns and huckleberries), encourage diversity of cultural practices, and promote cultural identity (Lake, 2013).

Our Approach and Principles Guiding Our Work

Our research is based on the methods and principles of CBPR, which grounds the design, implementation, analysis, and dissemination of research in community-led processes aimed at social transformation, community health, and ecosystem rehabilitation (Cornwall & Jewkes, 1995; Fals Borda, 1982, 1984, 2001). The emphasis on direct community participation and explicit attention to power dynamics in knowledge production is particularly important for research conducted with Indigenous communities, as the existence and value of Indigenous knowledge systems were systematically denied or marginalized in the process of colonization (Nadasdy, 2004; Reo & Whyte, 2011; Sundberg, 2014; Whitt 2009; Wråkberg & Granqvist, 2014). Recent histories of biocolonialism, cultural appropriation, resource extraction, and their associated impacts on Indigenous peoples demonstrate the risks at stake in supposedly "collaborative" research endeavors (Hayden, 2003; Karuk Tribe et al., 2017; Whitt, 2009). As Linda Tuhiwai Smith remarks, "research is one of the ways in which the code of imperialism and colonialism is both regulated and realized" (1999, p. 7). In alignment with Indigenous scholars and activists, we support the explicit decolonization of knowledge production, revitalization of Indigenous knowledge ways, and engagement of Indigenous people in research, management and policy processes (Bussey, Davenport, Emery, & Carroll, 2015; Carroll, 2015; Carroll, Garroutte, Noonan, & Buchwald, 2018; Kimmerer 2002, 2011, 2013; TallBear, 2014; Whyte 2017; Whyte, Brewer, & Johnson, 2016).

Our collaborative research endeavor entailed working through the difficult process of decolonizing knowledge relations between UC Berkeley and the tribes of the Klamath. Historically, UC Berkeley researchers collected stories, artifacts, ceremonial regalia, plant specimens, and even human remains from the Klamath. While some artifacts and remains have been returned to the Tribes, the legacy of the historical museumization of Native American culture by researchers from UC Berkeley specifically has created a significant trust barrier we have had to overcome (Rouvier, 2010).

Through the Karuk-UC Berkeley Collaborative (KBC), we attempted to develop a decolonial epistemology to bridge our diverse ways of producing knowledge about the world and to support Karuk eco-cultural revitalization initiatives. We have worked to create the conditions for transformative, community-driven research and extension and a clear process for tribal oversight to protect tribal cultural, intellectual, and material property. The main focus of our work has been following or developing tribal research protocols that simultaneously guard against misappropriation of tribal cultural and intellectual property and ensure that outside research is directed at ecological restoration and community empowerment (Karuk-UC Berkeley Collaborative, 2013). A document for guiding research and practice, *Practicing Píkyav: A Guiding Policy for Collaborative Projects and Research Initiatives with the Karuk Tribe* (KBC, 2013), was co-created by the Karuk Tribe and UC Berkeley researchers to structure collaborative research done on Karuk Aboriginal Territory and with Karuk people. The Karuk word *píkyav* means "to fix it," and in the context of true collaboration, we felt it imperative

to acknowledge "individuals and institutions at UC Berkeley and other institutions have not always acted in the best interest of California Indian Tribes" and to begin "mending problematic relationships among universities, researchers, and Indigenous peoples" (KBC, 2013, p. 10). Our team also followed the Yurok and Klamath Tribe protocols of oversight, including seeking approval from elder and tribal councils.

A second document, *Karuk Tribe Protocol with Agreement for Intellectual Property Rights of the Karuk Tribe: Research, Publication and Recordings* (Karuk Tribal Council, 2015), addresses issues of ownership regarding data and final research products. For the Karuk Tribe, these documents became a test of authentic partnership: were nontribal researchers and project participants truly dedicated to the principles of collaborative research and the protection of tribal intellectual property? With community-driven specification of not only the research priorities, study design, and data interpretation, but also the terms of ownership and authorship of research materials and products, tribal leaders, elders, and community members began to engage more freely with project stakeholders.

Integrating Indigenous and Western scientific knowledges into our food security research further acknowledges and validates multiple ways of knowing, improves research questions and outcomes, and ensures relevancy for Native American communities. Indigenous, traditional, and local knowledge generally refers to "a cumulative body of knowledge, know-how, practices, and representations maintained and developed by peoples with extended histories of interaction with the natural environment" (International Council for Science, 2002, p. 9). Indigenous knowledge (IK) systems secure the continuity of cultural stewardship practices and are maintained by Indigenous languages, seasonal teachings and training, cultural values, beliefs, ceremonies, stewardship practices, community laws, and governance systems (Lake, Parrotta, Giardina, & Davidson-Hunt, 2018). IK is a dynamic, adaptable system that is based on problem-solving skills linked to place-based experience on the land (Martens et al., 2016). The integrity of the knowledge depends on maintaining intergenerational knowledge transference and "integrity of the land itself" (Battiste, 2005, p. 8). IK or traditional ecological knowledge (TEK) thus has a strong potential for informing the science of ecological restoration (Kimmerer, 2000; Martinez, 1994).

Food Security, Native Foods Security, and Indigenous Food Sovereignty

Our research intentionally engages with the concept of food security,[5] as it is the dominant discourse in the U.S. used to define, measure, and develop solutions to hunger and malnutrition. We also engage the concept of food sovereignty,[6] which centers around the politics, inequalities, and exclusions inherent to global commodity food systems, as well as the right of people to define their own food and agriculture systems (Holt-Giménez, 2010; La Via Campesina, 2003). Our work aligns with emergent concepts of Indigenous food sovereignty, which emphasize decolonization, self-determination, and the inclusion of hunting, fishing, and gathering, as well as cultural and spiritual relations of exchange. These are ideals excluded from the dominant food security discourse and the more agrarian rights–based food sovereignty framework (Desmarais & Wittman, 2014; Grey & Patel, 2014; Kamal, Linklater, Thompson, Dipple, & Ithinto Mechisowin Committee, 2015). As Hoover explains, "the concept of Indigenous food sovereignty is not just focused on *rights* to land and food and the ability to control a production system, but also *responsibilities* to them, which encompasses culturally, ecologically, and spiritually appropriate *relationships* with elements of those systems" (2017, p. 39; emphasis in original).

[5] The USDA defines food security as "consistent, dependable access to enough food for active, healthy living" (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017, p. 1) and includes as a minimum (a) "the ready availability of nutritionally adequate and safe foods," and (b) "the assured ability to acquire acceptable foods in socially acceptable ways (without resorting to emergency food supplies, scavenging, stealing, and other coping strategies)" (USDA, 2019, "What Is Food Security?").

[6] In 2007 a collective group of farmers and Indigenous peoples assembled in Mali established the Declaration of Nyéléni, defining food sovereignty as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Forum for Food Sovereignty, 2007, para. 3).

In our approach, we treat food security and food sovereignty as distinct but interrelated concepts (Clapp, 2014; Jarosz, 2014). We believe genuine food security in Native American communities cannot be achieved without considering tribal sovereignty over territory and cultural resources, self-governance, and explicit confrontation of the colonial legacies impacting Indigenous food systems, including government food aid. To bridge the two concepts, we developed a community-based definition and method for measuring *native foods security:* having physical, economic, social, and legal access to all desired native foods with the appropriate quality and quantity throughout the year, and continuity of the cultural institutions that sustain them, including traditional ecological knowledge, social support networks, and cultural resource stewardship (Sowerwine et al., 2019). This added dimension of food security—native foods security—provides a more culturally relevant way to understand and measure food security in Native American communities by operationalizing Indigenous food sovereignty principles into tangible, measurable goals to improve the native food system and access to native foods for tribal members.

The next section provides more detail and specific examples of how CBPR and Indigenous knowledge, in particular, informed the development, implementation, and outcomes of key research, education and extension objectives in critical ways to support Indigenous food sovereignty.

Integrating CBPR into Research, Education, and Extension Objectives

Integrating Native Foods and Food Sovereignty into Food Security Research

To capture a comprehensive snapshot of the food system from a tribal perspective in the Klamath River Basin, we adapted the USDA Community Food Security Assessment Toolkit (Cohen, Andrews, & Kantor, 2002) with tribal collaborators in order to better suit the mixed-food economies and cultural food practices of Native American communities (Sowerwine et al., 2019). Rather than focus on the standard county-based unit of analysis, which often inadequately captures voices of Native people due to their relatively small population size, we focused on the bio-cultural region of the Klamath River Basin spanning four tribes, five counties, and two states, with priority on foregrounding Native voices and perspectives. Nearly 1,000 tribal residents of the Klamath Basin participated in our assessment, offering a unique tribal perspective on community needs and desires for systemic food system change. We employed mixed methods, collecting qualitative and quantitative data from May 2015 to October 2016, through (1) a household survey distributed to all listed Karuk, Yurok, Hoopa, and Klamath Tribal member and descendent households; (2) key informant interviews with tribal cultural practitioners and food system stakeholders[7]; and (3) focus groups with adults, low-income adults, and youth from the Karuk Tribe, Yurok Tribe, and Klamath Tribes. In total, we completed 711 household surveys, 115 key informant interviews, 47 tribal cultural practitioner interviews, and 20 focus groups (with 128 tribal participants). Quantitative data were analyzed using STATA, and qualitative data were coded using content analysis in NVivo (version 11.4.3).

Since the development of a standardized national measurement of food security in 1995, a version of the Household Food Security Survey Module (HFSSM) has been used by federal agencies, researchers, and community groups to evaluate and monitor food security and nutrition in the U.S. (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017). A portion of our assessment considered household food security and examined the appropriateness of the HFSSM measures for Native American communities.

In the design of our assessment, we worked with tribal collaborators to select and adapt a subset of the HFSSM questions related to accessing healthy foods, running out of food, running out of

[7] Food system stakeholders included the U.S. Fish and Wildlife Service, U.S. Forest Service, a local NGO, school lunch programs, Tribal Temporary Assistance for Needy Families (TANF) programs, Tribal Heritage Preservation Officers, local food vendors and food distributors, food assistance programs, local community and school gardens, and local health clinics.

money for groceries, buying less expensive meals, reducing the size of or skipping meals, and accepting food assistance (Sowerwine et al., 2019). We also added a number of culturally relevant questions suggested by our tribal collaborators related to the acquisition, exchange, and consumption of native foods and native foods–related knowledge, which contributed to the development of a novel indicator of food security in Native American communities: native foods security, that is, access to desired native foods throughout the year (Sowerwine et al., 2019).

In addition to finding extremely high rates of poverty and food insecurity, as noted earlier, we also found severe rates of *native foods* insecurity, with nearly 70% of all households never or rarely having access to all desired native foods throughout the year. As a result, 64% of Native American households in the region have been forced to rely on food assistance, compared with 12% nationally, and 20% reported dependence on food assistance because Native foods were not available (Sowerwine et al., 2019). Food assistance, however, is only a partial solution, as 84% of food assistance users still worry about running out of food (Sowerwine et al., 2019). Our findings suggest that supporting improved access to native foods will likely improve household food security, since households with high food security tend to have the best access to native foods.[8]

Study participants consistently voiced the desire for food sovereignty, wanting clear and consistent hunting, fishing, and gathering rights, improved quality of native foods through restoration efforts and prescribed fire, strong community and family relationships to facilitate the transfer of food and knowledge, and more affordable healthy foods in local grocery stores—but *not* more food assistance. In multivariate models predictive of food security and native foods security, many cultural variables, such as those associated with traditional knowledge and native food acquisition and exchange strategies, were significant predictors not only of native foods security but also of food security (Sowerwine et. al, 2019). Ultimately, our assessment found the HFSSM useful for measuring some components of household food security but lacking consideration for native foods and cultural food practices important to food security in Native American households. Thus, we recommend incorporating measures of native foods security and related socio-cultural variables into the HFSSM when evaluating food security among Native American households to ensure a more holistic understanding of and culturally-relevant response to food insecurity by and for Native American communities.

Our findings also call for a radical transformation of government food assistance policy and programs in Native American communities, directing investment toward eco-cultural restoration of Native food systems and support for tribal self-determination rather than continuing to reproduce neo-colonial models that reinforce food-aid dependency and undermine Indigenous food sovereignty (Mucioki et al., 2018).

Native Foods and Fire Ecology Research

We developed an integrated research framework to investigate which metrics are important for assessing changes in the condition of forests dominated by tanoak (*Notholithocarpus densiflorus*) and evergreen huckleberry (*Vaccinium ovatum*) across the Western Klamath mountain landscape. The field experimental research approaches integrated Indigenous/tribal and Western scientific knowledge of desired ecological and cultural conditions for tanoak and huckleberry forests, factors supporting acorn and huckleberry production, and tribal management strategies to enhance tree- and shrub-specific characteristics (Rossier & Lake, 2014). IK guided the development of tribally generated research questions based on tribal priorities and gaps in Western science to investigate how the current condition of tanoak and huckleberry–dominated forest, thinning of understory vegetation, and wildland fire affects tribal opportunities to access, harvest, and utilize these traditional foods (Figure 1). Forest and fire ecology were evaluated using ecological characteristics and sociocultural elements (e.g., aerial LiDAR to characterize forests, forestry plots, and acorn and huckleberry gathering

[8] We found that 67.86% of households with high food security stated that they usually or always have access to desired native foods.

site condition surveys) across scales ranging from regional to forest management unit, habitat to patch/stand, individual tree and acorn, and shrub and berry quality. This approach aligned habitat and resource quality evaluation methods of foresters and ecologists with those of tribal practitioners, providing unique insights about treatments (such as pruning, thinning and prescribed burning) and fire effects on acorn and huckleberry production for tribal food security (Rossier & Lake, 2014).

Project site selection and sampling techniques integrated Indigenous knowledge from cultural practices and Western scientific discipline-specific sampling methods. At the landscape scale, project sites were co-identified by researchers and tribes; at the habitat level, we focused on the tanoak-huckleberry–dominated sites; at the patch/stand level, project plots were established in areas that are or would be suitable for tribal gathering. Then, within each research plot, specific tanoak trees and huckleberry bushes were inventoried, and resource quality characteristics were sampled using metrics that ecologists and practitioners use (for a similar example, for basketry, see Hummel, Lake, & Watts, 2015). This integrated data collection approach allowed for a standardized data set about forest site- and resource-specific condition evaluation (e.g., tree species diversity and size and diameter, tree and shrub density, height, and cover percentage, canopy cover and light of the overstory) cou-

Figure 1. Using Culturally Appropriate Fire at the Base of Tanoak Acorn Trees to Support the Health of and Access to This Important Cultural Food for Middle and Lower Basin Tribes

At Klamath River TREX (Training Exchange) in October 2015 near Orleans, California.

Photo Credit: Lake U.S. Forest Service and Karuk Tribe.

pled with additional metrics that are important to tribal practitioners (e.g., berry and acorn abundance and quality). In addition, we surveyed the understory ladder and surface fuel load, which affect tribal practitioner access and foraging and gathering. At the same time, Karuk Tribe technicians conducted "food grove" assessments, which emphasized tribal criteria for the condition, quantity, and quality of tribally valued food and other cultural resources present at those sites.

In regions where federal or state governmental public lands encompass a Tribe or Indigenous group's ancestral territory, the surveys, protocols, and resulting data from collaborative assessments of tribal landscapes can strengthen Indigenous food sovereignty where forest landscape restoration strategies regarding forest and wildland fire management align with work to support food and water security (Lake, Parrotta, Giardina, Davidson-Hunt, & Uprety, 2018; Long & Lake, 2018; Sarna-Wojcicki, Sowerwine, Hillman, Hillman, & Tripp, 2019).

Karuk Tribe K-12 Native American Food Security Curriculum

The underlying principles of CBPR also guided the design, publication, and implementation of lesson plans developed for our Native Foods Curriculum objective. Community stakeholder discussions and the results of a 2014 Karuk Tribal Survey of needs for culturally responsive curricula mirrored a 2014 White House report that declared, "Native youth and Native education are in a state of emergency" (Executive Office, 2014, p. 19). Leading causes of low academic performance include a lack of culturally relevant curriculum and of culturally competent staff who understand how to reach Native youth.

We aimed to create a K-12 curriculum on the Native foods system. Respecting the wishes of the tribal community, we developed lesson plans that were relevant to students growing up within the aboriginal territories of our tribal partners. We consulted cultural practitioners to ensure the authenticity of the traditional knowledge imparted. Further, these lesson plans were not only aligned with the California Common Core Standards for English Language Arts and Literacy (California Department of Education, 2013), but they were written by and for tribal people, representing a culturally responsive education that "recognizes, respects, and uses students' identities and backgrounds as meaningful sources for creating optimal learning environments" (Gay, 2000, p. 3). Lessons also encourage the participation of parents and cultural practitioners, and facilitate student ability to learn place-based history, science, and culture all in one lesson, an approach that is consistent with the demonstrated preference of Native American students for experiential indoor-outdoor learning environments (Zwick & Miller, 1996) and curriculum that is culture- and place-based (Kawagley & Barnhardt, 1999) (Figure 2). Leaf Hillman, the Karuk Tribe director of natural resources and environmental policy, articulates the value of integrating IK into K-12 lesson plans:

> The Indian Boarding School era was one of many factors leading to the inter-generational trauma Native peoples experience today. By incorporating Native American traditional ecological knowledge into the lessons taught in local schools, we hope to mitigate some of the wrongs done to our people in the past. . . . This effort represents a valuable contribution to tribal sovereignty.

Integrating cultural values into educational curricula and pedagogy is by no means a new idea. Policy recommendations hereto have been salient in a host of official reports on Indigenous education, including the 1928 Meriam Report, which advised employing more Indigenous teachers, implementing early childhood programs, and integrating tribal languages and culture into schools as potential solutions to the ongoing underperformance of Indigenous students (Castagno & Brayboy, 2008). And while these recommendations have remained largely unheeded by school administrators, researchers continue to show that educating students in culturally responsive ways yields improved academic outcomes. Conversely, educating Indigenous students through assimilative processes has failed to improve academic success (Castagno & Jones Brayboy, 2008; Demmert, 2001).

With the active support of the community and this research in mind, the Karuk Tribe finalized 89 lesson plans that center content relevant to tribal identity and the traditional food system. Modeled after lessons developed by the Klamath-Trinity Joint Unified School District under an Indian Land Tenure Foundation grant, the *Nanu'ávaha* ("Our Food") K-12 curriculum has been met with widespread stakeholder endorsement and has been adopted by the school boards of three public school districts. Reported outcomes have included increased student engagement, willingness to complete lesson assignments, and a changing dynamic with "at risk" student populations (Talley, 2016). Local K-3 teacher Denise described the impact the curriculum has had on Native children's self-esteem while building their interest and connection to school:

> Kids who don't necessarily identify with other parts of school are like "I know this. I know this, I can share this, this is important". . . school is different than other parts of their lives, so they can see a connection between what they know and what's valuable learning—it just makes it more real. (Talley, 2016, p. 64)

The increased number of elementary school students conducting research on Karuk tribal history and sovereignty may also be attributable to this tribal curriculum. The results of the 2016 Karuk Tribal Needs Assessment for K-12 Education demonstrated the overwhelming support for

Figure 2. Youth in Happy Camp, California, Learn How to Prepare and Cook Pacific Lamprey (*Lampetra tridentate*)

these culturally relevant environmental education lessons. Since then, the Karuk Tribe has been awarded a four-year grant by the U. S. Department of Education to continue expanding upon this successful model project.

Establishment of Karuk and Yurok Tribal Herbaria

A herbarium is a collection of dried plant samples and associated data used for long-term research and educational purposes. These materials, called herbarium specimens, may include pressed and mounted plants, seeds, fungi, dry fruits, wood sections, pollen, frozen DNA extractions, and fruit-preserved flowers or fruits. Like other museum collections, plants gathered in tribal territories often find their way into university collections, yet tribes have little familiarity with or access to these plant specimens, as herbaria are usually affiliated with universities, museums, and botanical gardens. There are approximately 3,000 herbaria in over 165 countries, with an estimated 350 million specimens (University of Florida Herbarium, 2004). To date, the Karuk and Yurok Herbaria are two of only three known tribal herbaria (the Navajo Nation Herbarium (NAVA) was the first, established in 1997 [Navajo Natural Heritage Program, 2019]).

Throughout the course of our project, the Karuk and Yurok Tribes collected, pressed and mounted, and preserved hundreds of plant specimens of cultural and regional significance, including food, medicine, baskets, bows, nets, regalia, ceremonial, and other traditional uses. In partnership with the university and the Jepson Herbaria at UC Berkeley, natural resource technicians from each tribe were trained in voucher specimen collection, mounting, and long-term preservation by visiting the herbaria at Berkeley and receiving training locally from Berkeley professors and post-docs. Tribal staff guided university researchers in plant collecting, drawing on Indigenous knowledge of the location, phenology, and quality of culturally important plants and their uses. Tribal codes that are founded on Karuk TEK govern where and how plants are collected for the herbaria, ensuring that plant populations are maintained sustainably. Photographs and related data accompanied each pressed plant, with the goal of using the collection to increase the ability of tribal people to recognize, locate, and consume food plants and use fiber plants, while building their knowledge about the importance of these plants for nutrition, health, and cultural traditions.

At the end of the five-year project, tribal technicians continue to train tribal youth and adults in voucher specimen collection and mounting, lessons which have since been integrated into tribal curriculum and other workshops (Figure 3). While the science of voucher specimen collection and preservation is grounded in Western science disciplines of plant and archival science, the tribal herbaria support and sustain cultural plant knowledge and its transmission. Plant habitat, cultural use, and related ethnobotanical knowledge are often embedded in Karuk plant names, and as such guide how plants are classified and cataloged in the Karuk herbaria. Because herbaria collections can last for hundreds of years,[9] tribes can utilize these culturally important plant collections for myriad research purposes, such as monitoring the distribution and range of culturally important plants under changing climate conditions and supporting conservation efforts.

Establishing the Píkyav Field Institute: A Tribally Led Academic and Vocational Education, Training, and Research Institute

Faced with continued and, finally, unresolvable hurdles in completing one of our educational objectives, "to create a 24-unit community college Native American Food Security Certificate in agricultural and traditional foods" (UCB, 2018), due to staff position turnover and community college defunding, project leaders decided in the project's third year to redirect efforts in favor of consolidating, enhancing, and sustaining the long-standing environmental education, training, and research opportunities offered by the Karuk Tribe Department of Natural Resources (KDNR). Our tribal partners reasoned that a culturally responsive education in food security needs to begin at home and in the community, continue in classrooms and field curricula offered at local schools, and carry

[9] The oldest known herbarium is believed to be in Bologna, Italy, dating from around 1532 (University of Florida Herbarium, 2004).

into the skills and practices of the workforce. In alignment with the principles and philosophy guiding KDNR's integrated approach to contemporary adaptive land and resource management, as described in their Eco-Cultural Resources Management Plan (Karuk Tribe, 2010), higher education and research opportunities should be grounded not only in the teachings of Western science, but also in Indigenous knowledge.

With these goals in mind, and supported by project partners, informed by the early successes of the Food Security project, and guided by the results of a tribal needs assessment for K-12 education, our Karuk partners detailed their vision for culturally responsive environmental education in the KDNR Strategic Plan. Named for the Karuk word for "to fix it," the Píkyav Field Institute was conceptualized to include five divisions related to academic and vocational education, training, and research: K-12 Environmental Education, Environmental Workforce Development and Internships, Environmental Higher Education and Research, Food Security, and the Sípnuuk Digital Library. Leveraging infrastructure, tribal capacity, and experience gained through the Food Security grant, the Karuk Tribe was able to win a number of subsequent grant awards to build each of the five divisions. In the Food Security grant's final year, the Karuk Tribe was awarded a four-year grant by the U.S. Department of Education, officially launching the Píkyav Field Institute in support of college and career readiness of tribal youth. In reconnecting tribal youth with their cultural heritage, the project aims to improve tribal student self-esteem and understanding of important connections between K-12 lesson content, tribal identity and responsibilities, and academic achievement related to their personal career and college goals (Fox, 2006).

Integrating Cultural Values Into Extension

Development of extension programming in tribal

Figure 3. Youth in Orleans, California, Learning about Pressing and Mounting Herbarium Voucher Specimens for the Karuk Herbarium

Photo credit: The Karuk Tribe.

communities takes time, humility, and an honest acknowledgment of the colonial legacy of extension (Smith, 2013; Stein, 2017; Whitt, 2009). The very term "extension" emanates from a knowledge deficit model inherent in Western scientific modes of knowledge production and dissemination (Calo, 2018). It implies that extension agents are "extending" scientific knowledge to communities that lack this knowledge. Integrating IK into food system extension programming prioritizes Native American teachers and teachings, oral history transmission through storytelling, a focus on native foods, and intergenerational knowledge transference, helping to heal intergenerational trauma, promote cultural identity, and deepen connections between people, place, and spirit. Engaging tribal cultural practitioners as co-leaders in the design of extension programming, such as food-related workshops and 4-H, demonstrates respect for their knowledge, contributes place-based traditional ecological knowledge, ensures that the content of the workshops is relevant to the tribal community, and encourages participation of intended audiences.

Over the course of the Tribal Food Security Project, the Karuk, Yurok and Klamath Tribes hosted 238 regular workshops and 58 seasonal food camps focused on understanding, finding, gathering and processing edible native foods and fibers as well as other subsistence skills, reaching thousands of tribal members and descendants with knowledge that had been lost to many families, and this programming continues. Taught by experienced cultural practitioners and tribal elders, Native food workshop offerings have included acorn harvest and preparation, eel preparation, salmon smoker construction, pit oven cooking, deer and salmon canning, hide tanning, camas digging and cooking, wocus harvest and preparation, tule mat weaving, traditional basketry, willow gathering, spring medicine, history of management practices, fish and plant identification, and many more activities (Figure 4). At the end of each event, participants evaluated how much they had learned and their intent to apply what they learned. While responses varied somewhat, the majority of participants found them beneficial. For example, 80% to 100% of participants across all camps reported learning something new, and 63% to 100% said that they wanted to learn more or to implement what they learned. One participant shared the value

Figure 4. Women Weaving Tule Mats at a Workshop in the Upper Klamath River Basin

of the workshops in reviving traditional knowledge:

> I grew up with acorns in my household and it had not been as present in my adult life. The food security activities have REALLY brought it back to a central place in my life. From the workshops I've attended to the kids coming home talking about acorns. It's balancing *to have the native knowledge infused into regular daily things like doing laundry.*

Workshops such as these have helped build subsistence skills and an infrastructure for increased community confidence, access to healthy foods, and survival strategies. As one participant articulated,

> I have learned something new in every class. I knew some basics of canning, pruning, butchering, grafting, seed saving, bread making, fermented foods, sourdough bread, and drip irrigation but after the class, I felt more confident in my own abilities to move forward with knowledge that was shared.

Efforts to start a 4-H program, on the other hand, were met with limited success, as 4-H programming was perceived to be focused heavily on livestock production and farming, both of which are associated with the colonization of Native lands and people, and Native Californians historically were never farmers or ranchers. While 4-H programs can be adapted to local conditions, it takes time to engage tribal leaders in exploring options and co-designing the program. Ultimately, the Karuk Tribe opted to develop its own after-school leadership and youth development program rooted in the restoration of cultural knowledge and values around Native foods and stewardship principles. This innovative program, *Ishkêesh'tunviiv* (River Kids), integrating Native values and cultural foods into afterschool programming has become an institution in the Mid-Klamath, engaging 141 both tribal and nontribal youth in activities that feature Karuk native foods and associated cultural heritage. The goal is to provide background information such as history of management practices, general biological and botanical information necessary for fish and plant identification, hands-on experience with Native food sources, and to encourage the community to feel comfortable with the resources available to them. Activities include harvesting, food preparation, cultural plant pressing, art, and storytelling. This program is supported by a diverse group of educators using a combination of Western science and TEK. As part of the evaluation, parents and teachers were asked to share their impressions; 95% of the respondents expressed support for the approach, incorporating heritage, traditional foods and medicines. Many described the children's enthusiasm for learning about and harvesting Native foods that were introduced in sessions:

> On the way home from school, [a child] made me stop at all the madrones and service berries to gather berries. He didn't stop talking about what he'd learned until we got home. (Karuk Tribe parent assessment)

> I loved watching the kids talk about some of the plants they learned about, and what they did or how they cracked acorns. They were really funny and cute—enthusiastic. I think they were proud of being Karuk. (Evaluation participant)

Partnering with the Oregon State University Master Gardener program helped to address the lack of human resources identified as one of the challenges to implementing community and home gardens in the Klamath Tribe ancestral territory, the Upper Klamath. The Food Security Project paid the tuition for eight Klamath Tribal members to complete the 60-hour Master Gardener training program. Graduates perform volunteer hours to keep Food Security projects moving forward in the Klamath Falls and Chiloquin, Oregon, area, and are continuing to offer local residents the popular Seed to Supper curriculum, a six-week class that reached 66 students over the life of the grant.

Summary of Project Outcomes and Reflections on Lessons Learned

Over five years, more than 1,300 educational events increased stakeholder knowledge and capac-

ity to engage in transformative food system change. Project activities reached 17,498 participants (many of whom were repeat participants), the majority of whom were Native, and 55% of whom were youth. All three participating tribes leveraged project successes to secure an additional US$6,093,216 (to date) for expanded and continuing food security and food systems programming.[10]

In an evaluation of 111 project participants through online or phone surveys near the end of the grant, 76% reported that they had learned something new, and 68% had applied new skills at home, while 65% felt the community was more food secure and 81% felt that the project had changed the community in other positive ways.[11] We offer some reflections and lessons learned highlighting both challenges and successes that we hope can support other tribes, universities, federal and state agencies, and nonprofits seeking to develop partnerships to strengthen Indigenous food sovereignty.

Strengthening Local Capacity and Leveraging New Relationships to Improve the Food System

Opportunities to strengthen local capacity included education, professional development, and infrastructure development, as well as leveraging new regional partnerships to sustain project outcomes beyond the grant. Virtual shared learning networks proved invaluable, such as the Mid-Klamath Foodshed Facebook page, which became a primary hub of information exchange where over 700 people continue to trade garden starts, ideas and information, and news about upcoming events. Regionally appropriate technical bulletins on gardening and farming developed under the grant remain available free of charge on the Mid-Klamath Watershed Council website (MKWC, 2019). Both the MKWC and the Karuk Tribe leveraged this project to secure two new USDA Farm to School projects. They also joined forces to identify and rehabilitate 17 abandoned orchards by training tribal technicians in orchard assessment, pruning, grafting, and restoration. Through an innovative partnership between the Klamath Tribes and the Oregon Institute of Technology, a team of students constructed several greenhouses for the tribes free of charge as part of a greenhouse design competition. Furthermore, co-producing workshops with other organizations has strengthened regional relationships, laying the groundwork for ongoing knowledge exchange.

Food Sovereignty as a Precondition for Food Security in Native American Communities

As discussed previously, there are unique food security considerations for Native Americans related to harvesting, sharing, and consuming traditional and native foods that are often overlooked in standard research studies on food security. Our study found that access to native foods and intergenerational knowledge transference were strong predictors of food security, suggesting that food security assessments and interventions in Native American communities should consider principles of food sovereignty that include self-determination and the ability not only to access healthy, affordable foods and all desired native foods, but also to *steward* the landscapes and habitats with cultural management practices, such as prescribed burning, to enhance the productivity, availability and quality of Native foods and fibers. Stewardship of cultural landscapes for Native foods and fibers requires and enables intergenerational transmission of Indigenous knowledge, improving not only nutritional health, but also strengthening cultural identity and associated physical and mental health and cultural well-being. In other words, genuine food security in Native American communities, we argue, cannot be achieved without food sovereignty. This understanding helped guide our research on food secu-

[10] Together with the Karuk Tribe, the University of California project team recently secured a US$1.2 million, three-year grant from the USDA AFRI Resilient Agroecosystems in a Changing Climate Challenge Area program to conduct research and augment tribal capacity to assess, monitor, and revitalize traditional food and fiber plants in Karuk Aboriginal Territory under changing climate conditions.

[11] For more information on the activities, outputs, and impacts of the larger project, including project newsletters, workshops, blogs, tribal food system assessments, and other publications, visit the Karuk-UC Berkeley website at https://nature.berkeley.edu/karuk-collaborative/

rity to be more inclusive of tribal concerns and ideas for increasing tribal stewardship of forests and fisheries, and made the case for redefining how food security is defined and measured in Native American communities (Sowerwine et al., 2019).

Tribal Leadership, Staffing, and Funding

Academic research institutions seeking to partner with tribes on grant-funded projects should offer tribal partners PI status and dedicated funding for tribal staff and travel in order to help strengthen tribal capacity, promote professional development, and enable full participation by tribal partners. Equitable allocation of funding and directorship signifies respect and commitment to equity and inclusion. Our project was collaboratively designed by Klamath Basin tribal and community members, guided by co-project directors that included four tribal representatives (50% of the leadership team), and staffed locally by 15 primarily tribal hires, both full- and part- time. Tribal co-PIs contributed to the proposal development, co-development of research questions, and identification and equitable allocation of funding needs and extension programming that they sought to prioritize.[12] Each tribe received a subaward equivalent to and in one case larger than the university prime sponsor. However, because the university had no experience subcontracting with tribes, there were significant delays in getting subaward approval, and subsequent delays in administering the funds once the grant was awarded, due to bureaucratic university hurdles. This impeded our attempts to build a better and more equitable relationship between the university and the tribe.

Building and Maintaining Relationships of Trust

Building successful partnerships with tribes requires learning about tribal relationships, governance structures, and cultural norms. For example, when identifying with whom to partner, there may be traditional governance councils beyond the official tribal council such as an elders' council, a tribal heritage preservation officer, a renowned cultural practitioner, or a cultural resource advisory board that must be consulted. In addition, it is important to understand the complexity of social, family, and community relationships when considering outreach, programming, participant recruitment, and implementation strategies. In light of historical circumstances, it can take time to establish relationships of trust, so starting early is important. Even after trust and partnerships are established, it is important to maintain strong, open communication lines, as misunderstandings inevitably arise over deadlines, expectations, and clarity of roles and responsibilities.

Flexibility and Adaptability

Priorities and capacity may shift over time with staff turnover and new hires, as new partnership opportunities arise, or as the feasibility of certain activities come into question due to technological challenges, delayed funding, insufficient resources, and greater understanding of need and capacity. USDA and partner flexibility to adapt timelines and/or programming based on lessons learned in real time resulted in stronger outcomes. Regular monthly check-ins allowed for ongoing course correction. For example, as project team members began to carry out the objective of promoting intertribal trade of cultural foods and fibers, it was realized that because of the limited availability of those resources, there was insufficient volume to engage in trade. The objective was then adapted to support intertribal youth and family exchange focused on sharing knowledge and skills related to the procurement and preparation of cultural foods and cultural resources.

Our CBPR approach guided an iterative development of assessment tools that was time-consuming but resulted in a survey that both reflected the questions most important to our tribal partners and was carefully worded so as to protect confidential tribal information, such as family gathering sites. While the food system assessment

[12] It is important to keep in mind that tribes may have funding needs for specific responsibilities that academic researchers may not be familiar with or may have overlooked that need a dedicated budget, such as tribal oversight, high cost of transportation as distances from a tribal center can be extensive, cost of staff time to recruit participants, attend meetings, and conduct project evaluations, and offering meals and/or other forms of reciprocity to study participants.

was originally intended to be completed by the end of the grant's second year, to help guide subsequent programming, the realities of delayed funding and hiring, collaborative tool development with multiple community partners, three separate tribal approval processes, and scheduling hundreds of focus groups and interviews meant that assessment design alone took nearly a year, and end-to-end implementation took well over a year. While the impact of this delay was mitigated in our case by the collaborative project management structure of the grant, which allowed for constant tribal input into project activities, groups aiming to conduct food system/food sovereignty assessments as guidance for planning should ensure adequate time for the steps required.

Acknowledging Diverse Institutional Cultures and Norms

Tribes may have different research approval processes, timelines, and institutional resources to support grant applications, which should be taken into account. For example, tribes may have research protocols, such as those described in this article, and/or require input from multiple tribal entities such as elders, cultural resources, and/or tribal councils prior to submission. Universities seek protection of *university* intellectual property, and Institutional Review Boards (IRBs) are designed to protect *individual* human subjects; however, they are not designed to protect the collective and individual intellectual property of Indigenous communities. This concern led our team to develop several mechanisms for tribal oversight of our project in addition to the *Practicing Píkyav* protocol discussed above. First, we co-developed the grant proposal with tribal partners and sought approval from elder, cultural, and tribal councils before submission. Second, a tribal staff member was responsible for overseeing the development and implementation of each objective. This helped keep researchers accountable to tribal priorities and governance requirements and ensured protection of intellectual property.

Contrasting Incentives and Rewards

Tensions can sometimes arise between academic and agency merit and evaluation processes, and tribal goals. Granting agencies, for example, expect quantified reporting of outputs and outcomes, which requires formalized evaluation techniques that are not always culturally appropriate. Academic institutions similarly evaluate merit based on standards that are often out of sync with tribal values and timelines. Merit and promotion at academic institutions value single and first-authored publications in peer-reviewed academic journals, while many Indigenous communities perceive knowledge as collectively held. What constitutes authorship can sometimes raise questions that are difficult to answer, and tribal review processes, critical to ensuring equity in research, may require a longer time frame. It is therefore necessary that academic institutions understand and acknowledge the principles of CBPR and not penalize researchers who are committed to authentic community partnerships and tribal oversight in publication. It is also important to acknowledge that publishing may be a less significant priority for tribal partners: it may not be part of their reward structure, it can require a huge amount of time, and it may not align with their cultural norms of sharing knowledge. Nevertheless, it is essential as academics and educators committed to CBPR to consider co-authorship and jointly holding copyright with community partners and/or tribal organizations, secure permission for publication, and continue to promote scholarship that not only advances our careers but also advances the well-being of tribal communities. Translating research results into articles for tribal newsletters, blogs on tribal community Facebook pages, community presentations or symposia, policy briefs, white papers, and reports with accessible data and findings can provide tribes with critical data and resources they can leverage when applying for new grants, engaging in government-to-government consultations, communicating with policy-makers, developing tribal programming to address identified challenges, and teaching the next generation of tribal youth.

Conclusion

Multi-agency partnerships with tribes to achieve food sovereignty require attention to the historical impact and ongoing legacy of colonization and institutionalized racism, which contribute to the

vast educational, economic, health, and nutritional disparities observed in Native American communities across the country. Collaborative partnerships require deep listening, respect, inquiry, and commitment to dismantling research, educational, and extension hierarchies. Employing a CBPR framework placed tribal goals at the center of this project, guided by Practicing Píkyav**,** a new policy for engagement developed by UCB researchers and the Karuk Tribe to establish equitable ground rules for project work.

Integrating cultural values and Indigenous knowledge into food security research, education, and extension helped illuminate crucial conditions under which true food security would not be attainable without consideration of Native foods and food sovereignty. Indigenous food security and sovereignty are facilitated by collaborating with tribes as co-equal research partners to guide, inform, direct, and participate with oversight in the full research cycle process: contributing to research questions, site selection, methods, analysis, interpretation of results, and communicating findings and implications to inform policy and management strategies, prescriptions, and treatments.

Challenges in collaborative partnerships inevitably arise that emanate from differences in institutional cultures, expectations, delayed funding, and shifts in priorities, and that can threaten to undermine the collaboration. It is therefore imperative to maintain transparency and honesty, open lines of communication, and recognize that relationships of trust require time, ongoing cultivation, and authentic respect for tribal knowledge, tribal sovereignty, and tribal self-determination.

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Contribution of wild foods to diet, food security, and cultural values amidst climate change

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Abstract

Wild foods are recognized to contribute to diet and food security through enhancing the availability of local, diverse, and nonmarket food sources. We investigated the contribution of wild foods to diet, food security, and cultural identity in a Native American[1] community in the context of climate

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Author Note

The research presented in the article reflects the masters-level work completed by Erin Smith, in accordance with the Graduate School and Department of Health and Human Development at Montana State University. The findings from this study have been presented at the 2018 annual meeting for the Societies of Ethnobotany and Ethnobiology in Madison, WI, as well as the 2018 Food Sovereignty Summit hosted by the Rocky Mountain Tribal Leaders Council in Billings, MT.

[1] The term 'Native American' was determined to be the preferred term for referencing the Native American community in this study, based on consultation from our community advisory board.

change. Structured interviews were conducted with low-income residents of the Flathead Indian Reservation[2] in Northwestern Montana who participate in the federal Food Distribution Program on Indian Reservations, also known by participants as 'Commodities.' Responses to structured questions were analyzed for frequency, and open-ended responses were coded and analyzed to identify prevalent themes. Our analysis indicated that half of participants were food insecure. Approximately 28% of participants engaged in at least one wild food procurement activity, including hunting, fishing, and harvesting. On average, participants who engaged in one or more wild food procurement activities were more food secure than those who did not. Results highlight the multidimensional valuation of wild foods by participants including taste, freshness, nutritional quality, being a traditional community practice, and providing a sense of self-sufficiency. Climate change is perceived by participants to be adversely impacting wild food systems due to increased variability in seasonality and precipitation and increased incidences of wild fire. Findings point to the need for community-based strategies to strengthen wild food knowledge toward enhancing food sovereignty in Native American communities, in the context of climate change.

Keywords
Wild Foods, Food Environment, Food Security, Food Systems, Climate Change, Native American, Indigenous, Traditional Foods

Introduction

Food environments are the consumer interface of the food system and act as crucial determinants of food security by influencing the affordability, availability, desirability, and convenience of foods (Herforth & Ahmed, 2015). Natural food environments provide local access to wild and cultivated foods from nonmarket sources, while built food environments contribute to food security by providing foods for purchase in market settings (Ahmed & Herforth, 2017). Wild food environments persist as integral components of Indigenous and traditional food systems (Damman, Eide, & Kuhnlein, 2008). Indigenous and traditional food systems are place-based food systems comprising foods from the local environment that are obtained and prepared in ways that are culturally acceptable and reflect cultural heritage (Kuhnlein, 2013), including foods that are hunted, fished, and harvested (Lemke & Delormier, 2018). The Royal Commission on Aboriginal Peoples (RCAP) describes traditional food systems as "part of a cultural heritage. Thus, [traditional] food is holistically entwined with culture and personal identity, as well as with physical health" (RCAP, 1996, p. 194). Within communities, traditional foods promote sustainability by supporting food security and improve health by reducing critical micronutrient deficiencies (Samson & Pretty, 2006; Vincetti, Eyzaguierre, & Johns, 2008). Furthermore, traditional foods support the cultural, economic, and environmental sustainability of food systems (Ford, 2009; Kuhnlein & Receveur, 1996; Mason & Lang, 2017).

Colonization of Indigenous peoples has resulted in a dramatic shift away from wild food environments (Compher, 2006) and toward consumption of highly processed, store-bought foods that are high in refined sugars, saturated fats, and salts that are typical of the "Western diet" (Popkin, 2001; Satia, 2010). Evidence suggests that this nutrition transition is having a profound and disproportionate impact on the health of Indigenous peoples (Damman et al., 2008). Improving nutritional quality of foods available in the food environment, including increasing the availability of wild foods, has been identified as a strategy to mitigate the nutrition transition and improve diet and health outcomes (Chodur et al., 2016; Damman et al., 2008; Herforth & Ahmed, 2015).

In the United States, the nutrition transition is well-documented among Native American populations, with subsequent diet-related health disparities (Compher, 2006; Jernigan, Salvatore, Styne, & Winkleby, 2012; Kuhnlein, 2013; Story, Strauss, Zephier, & Broussard, 1998). Obesity rates among

[2] The term 'Flathead Indian Reservation' was determined to be the preferred term for referencing the location in which this study was held, based on consultation from our community advisory board.

Native Americans are 50% higher in adults and 30% higher in adolescents than Anglo-European Americans, and Native Americans are 2.5 times more likely to be diagnosed with diabetes (U.S. Department of Health & Human Services, 2017). One in four Native Americans is food insecure, twice the U.S. average (Jernigan, Huyser, Valdes, & Simonds, 2016).

Several federal assistance efforts have emerged to address health disparities among Native American communities, including the Food Distribution Program on Indian Reservations (FDPIR), commonly known in some reservation communities as 'Commodities.' The FDPIR provides a monthly food supply sufficient to meet basic nutrient needs to low-income Native and non-Native Americans living on or near reservations (U.S. Department of Agriculture [USDA], 2014). Participants in FDPIR travel to local food distribution centers (FDPIR centers) and self-select a limited number of food items from various food categories based on the number of family members in their household. Previous research has found that the FDPIR is the primary source of food for approximately 40% of participants nationwide (Pindus et al., 2016), and that 31% of FDPIR participants procure some amount of food from hunting, fishing, or gardening (Pindus et al., 2016). At the same time, previous research highlights that food offerings of the FDPIR fail to meet national dietary recommendations, including limited fresh fruit and vegetable offerings, which may exacerbate health challenges of Native American communities (Byker Shanks, Smith, Ahmed, & Hunts, 2015).

The food sovereignty movement has emerged in response to the detrimental nutrition and health outcomes associated with the nutrition transition (Patel, 2009). Specifically, the food sovereignty movement advocates for the protection and ownership of built, wild, and cultivated food environments to enhance food security and human health for all peoples (Patel, 2009). Food sovereignty movements are increasingly manifest in Native American communities, calling for the strengthening of Indigenous food systems including promotion of wild foods (Patel, 2009).

At the same time, climate change threatens wild food environments and Indigenous food systems (Bharucha & Pretty, 2010; Doyle et al., 2013; Ericksen, 2008; Ford, 2009; Raiten & Aimone, 2017). Wild food environments are experiencing regional climate variability, including changes in temperature and seasonal patterns (Lynn et al., 2013), which threatens wild food availability, accessibility, and quality (Ford, 2009; Parry, Canziani, Palutikof, van der Linden, & Hanson, 2007). For example, thinning and reduced arctic and subarctic sea ice shortens the hunting season for Inuit populations in the Canadian Arctic (Ford, 2009). In Montana, members of the Crow Nation have observed migrations and reductions in freshwater fish populations attributable to warming waters (Doyle, Redsteer, & Eggers, 2013).

The mutualistic concepts of enhancing resilience and food sovereignty are recognized as approaches for mitigating the negative impacts of climate change and other challenges of the Anthropocene that threaten Indigenous food systems (Ford, 2009; Patel, 2009; Shumsky, Hickery, Pelletier, & Johns, 2014; Tendall et al., 2015). Building food system resilience, or "the capacity over time of a food system and its units, at multiple levels, to provide sufficient, appropriate, and accessible food to all in the face of various and even unforeseen disturbances" (Tendall et al., 2015, p. 19), involves identifying and reducing existing vulnerabilities while increasing capacity to adapt to change (Shumsky et al., 2014). Increased utilization of wild foods can enhance food system resilience by incorporating local biodiversity and alternative modes of food procurement into diets, thus reducing omni-dependence on built food environments (Ford, 2009).

The purpose of this research was to investigate the contribution of wild foods to diet, food security, and cultural values in the context of climate change among FDPIR participants on the Flathead Indian Reservation in northwestern Montana. We addressed our study objective through implementation of semi-structured interviews with Native American and non-Native American residents enrolled in the FDPIR.

Materials and Methods

Study Site

There are seven federally recognized tribes and one

state-recognized tribe in Montana. Approximately 70,000 Native Americans live in Montana, of whom 63% reside in urban centers across the state (U.S. Census Bureau, 2016). This research was carried out on the Flathead Indian Reservation (FIR), the remaining homeland of the Confederated Salish, Kootenai, and Pend d'Oreille Tribes. The FIR is the fourth largest reservation in Montana, comprising 1.3 million acres (526,000 hectares) situated within intermountain valleys in the Rocky Mountains and including Flathead Lake (Confederated Salish & Kootenai Tribes [CSKT], 2013). Flathead Lake is the largest freshwater lake west of the Continental Divide, drawing both tourists and non-native residents to the region. The current population of the FIR is 28,938, and less than one-third (28.3%) are of Native American heritage (U.S. Census Bureau, 2016). Among the Native American population, 5,333 individuals are tribally enrolled members of the Confederated Salish and Kootenai Tribes (CSKT, 2015). CSKT members have year-round access to open lands of the reservation, with some limitations, under the Hell Gate Treaty of 1855, for hunting, fishing, and gathering of wild foods (Kappler, 1855). Vegetation on the FIR is dominated by conifer forest and grasslands. (Arno, 1979; Montana Fish, Wildlife, and Parks, 2015). The FIR has a mild climate that is dominated by Pacific Ocean activity, and its forests are drier relative to surrounding forests (Arno, 1979).

The subsistence patterns of the Salish, Kootenai, and Pend d'Oreille tribes remain a central component of tribal cultural identity (CSKT, 2017). The CSKT tribal government has made efforts to preserve their food traditions by establishing cultural committees and a Natural Resources Department (CSKT, 2017). In addition, the CSKT have developed a Climate Strategic Plan "to develop potential programmatic and/or regulatory actions and changes … appropriate to addressing the effects of climate change" (CSKT, 2013, p. ii).

The poverty rate for both Native and non-Native residents of the FIR was 23.6% in 2015, according to a report by Montana State University Extension (2017), nearly twice the national average (Proctor, Semega, & Kollar, 2015). Food insecurity is considered a major health risk factor for all residents of the FIR (Administration for Children & Families, 2016), with 17.9% of the population participating in the Supplemental Nutrition Assistance Program, and 70.6% of students receiving free or reduced price school lunch in 2015 (Montana State University Extension, 2017). In addition to these programs, an average of 513 low-income households relies on FDPIR for a monthly provision of foods (Petet, 2017). This study was specifically focused on FDPIR participants.

The number of extremely cold days(≤-18 °C or 0° F)) in Montana has declined, and ends an average of 20 days earlier than a century ago (Pederson, Graumlich, Fagre, Kipler, & Muhfield, 2010). At the same time, the number of extremely hot days ((≥32 °C or 90 °F) has tripled, and the warm season lasts on average 24 days longer than a century ago (Pederson et al., 2010). Annual average temperatures have risen by 1.1° to 1.7° C (2 to 3° F) across the state since 1950, and changes in precipitation patterns have resulted in an overall decline in snowpack, accumulated layers of snow which act as an important water resource in high-altitude regions with extended winters (Whitlock, Cross, Maxwell, Silverman, & Wade, 2017). Additionally, Montana is experiencing an increase in the frequency and intensity of wildfires during the late summer months through September (Whitlock et al., 2017).

Tribal Partnership

This study was developed based on ongoing research by the study team beginning in 2012. The study team is made up of Native American and non-Native American researchers from Montana State University and Salish Kootenai College. The study team was advised by a community advisory board consisting of Native and non-Native residents of the FIR with expertise in food and health issues, as well as a Tribal Council member.

Participants

An initial 42 residents of the FIR were recruited as participants through flyers and word of mouth. Approval for the participation of human subjects in research was obtained from the Institutional Review Boards of the affiliated tribal college and

state university. Participants were considered eligible for the study if they were FDPIR recipients over 18 years of age and were residents of the reservation for at least five years. Given the diversity of FDPIR recipients and FIR residents, participants were recruited regardless of tribal affiliation. Participants received US$50 Visa gift card incentives for participating in the study.

Survey and Interview Tools

We utilized a mixed-methods approach for this study, with participants completing a combination of a structured survey and semistructured interviews. Participants were requested to complete a structured survey at the start of the study, which included the USDA Six-Item Short Form of the Food Security Survey Module (USDA, 2012) as well as sociodemographic information including age, gender, and Native heritage. The USDA Six-Item Short Form Food Security Module is a validated tool that measures household food security status.

The study team developed and administered a series of four semistructured interviews. The interview instrument was developed collaboratively by the study team, our community advisory board, and a panel of five experts in the fields of cultural anthropology, ethnobotany, nutrition, and environmental sciences. The interviews comprised structured and open-ended questions to characterize the frequency of wild food consumption, Wild Food Procurement, Wild Food Dietary Diversity, wild food valuation, perceptions and observations of climate change on wild foods, and environmental concerns (Appendix A). Wild Food Procurement is defined as the number and type of wild food procurement activities (hunting, fishing, and harvesting of edible plant foods) that participants engaged in. Wild Food Dietary Diversity is defined as the number and type of species of wild foods reported to be consumed in the community. Wild Food Valuation was further measured using a set of five Likert scale response questions.

Data collection began in August 2017 and ended in January 2018. Interviews were conducted by members of the study team who were trained by observing and practicing interviews with a Native American community member who has worked in the health field on the FIR for the last five years. Interviews were recorded using a digital recorder and transcribed by members of the study team.

Data Analysis

Food security scores were calculated by totaling the number of affirmative responses to the USDA Food Security Survey Module. An affirmative response indicates that the participant agreed that over the last 12 months due to financial constraints they either lacked access to food, skipped meals, or reduced the size and quality of meals (USDA, 2012). The USDA Food Security Module is reported on an inverse scale where lower scores indicate high food security, and higher scores indicate low food security. A score of 0 or 1 indicates high or marginal food security, 2 to 4 indicates low food security, and 5 or 6 indicates very low food security.

Recorded interview responses were transcribed and coded to identify prevalent themes (Saldana, 2016) using a grounded theory approach (Glaser & Strauss, 1967). A qualitative, thematic codebook (Saldana, 2016) was created to code interview responses by identifying four to five prevalent meaning units (sentences or phrases which highlight specific research themes or responses). The codebook was developed by reviewing 10 randomly identified interview transcripts. The research team reviewed and revised the codebook after practice coding multiple interviews. All interview responses were coded by two separate coders for inter-rater reliability, and discrepancies were resolved. Coded responses to each interview question were compiled to determine frequencies of prevalent themes. Responses were compared between Native American and non-Native American participants.

A score for Wild Food Procurement was calculated on a scale of zero to three, with zero indicating that the participant did not engage in wild food procurement, one indicating that the participant engaged in at least one form of wild food procurement (hunting, fishing, or harvesting wild plants), two indicating that the participant engaged in two forms of wild food procurement (e.g., hunting and fishing or hunting and harvesting edible plants or fishing and harvesting edible plants), and three

indicating that the participant engaged in all three food procurement activities (hunting, fishing, and harvesting wild plants). A score for Wild Food Dietary Diversity was calculated by summing the total number of wild food species that participants reported consuming.

JMP statistical software (version 12.0 SAS Institute Inc., Cary, NC) was used to carry out analysis of co-variance (ANCOVA) to understand the relationships between gender, age, Native heritage, and food security. Bivariate fit analyses were conducted to examine relationships between food security status and Wild Food Dietary Diversity scores, as well as with Wild Food Procurement scores. Significance level was set at p=0.05.

Results

Food Security and Demographic Data

A total of 42 participants completed the first interview, 32 completed the second interview, and 31 completed both the third and fourth interviews. Participants attributed their decision to drop out to participation barriers of time and transportation. The numbers reported in the results section are thus based on the total number of participants completing each interview. Participants consisted of CSKT Tribal members and descendants (n=22), Native non-CSKT members (n=5), and non-Native residents (n=15); 31% were male (n=13) and 69% were female (n=29). The average participant age was 54.45 years (SD=14.9).

Mean food security score was 2.05 (SD=2.04), indicating low food security. A share of 33% of participants experienced low food security, and 17% experienced very low food security. Men experienced higher food security on average than women (p=0.0437), and middle-aged participants (46–58 years) experienced lower food security than all other age groups (p=0.0026; Table 1). There were no significant differences in food security between Native American and non-Native American participants.

Wild Food Consumption and Dietary Diversity

Between a quarter and one-third of the participants engaged in at least one Wild Food Procurement activity, with 26.8% engaging in hunting, 24.4% in fishing, and 34.1% in harvesting wild plant foods. Additionally, 38.1% reported having one or more members of the household who hunt, fish, or forage wild plant foods. Just over one-quarter (26.2%) of participants stated that wild foods are shared within the community among friends, family, and at community gatherings. Wild Food Procurement varied by gender but not by age, with men (M=1.54) engaging in an average of one more food procurement activity than women (M=0.54, p=0.0028).

Individual reporting of Wild Food Dietary Diversity ranged from zero to eight wild food species, with an average of 3.34 wild foods reported per household. The most commonly reported wild game species consumed were deer (*Odocoileus spp.*, n=22), elk (*Cervus canadensis*, n=17), moose (*Alces alces*, n=5), and bison (*Bison*, n=4). The most commonly consumed wild fish reported were trout (*Salmo spp.*, n=11), bass (*Morone chrysops*, n=6), and pike (*Esox lucius*, n=4). Huckleberries were the most commonly reported wild edible plant consumed (*Vaccinium membranaceum*, n=23). Others included bitterroot (*Lewis rediviva,* n=4), chokecherries (*Prunus virginiana*, n=3), serviceberries (*Amelanchier alnifolia*, n=2), wild mushrooms (not specified, n=2), and wild greens (not specified, n=1). See Figure 1 for the most commonly consumed wild foods among participants.

Rates of wild food consumption varied by

Table 1. Mean Food Security Score by Gender, Age, and Native Heritage

Scores of 0–1=high or marginal food security, 2–4=low food security, 5–6=very low food security.

Demographic Parameter		Mean Food Security Status	Standard Deviation
Gender	Male (n=13)	1	2.0
	Female (n=29)	2.5	1.8
Age by Quartile	Q1 (21–45 yrs)	2.1	1.4
	Q2 (46–58 yrs)	3.6	2.3
	Q3 (59–65 yrs)	1.7	1.9
	Q4 (66–79 yrs)	0.3	0.5
Native Heritage	Native (n=27)	2.1	2.1
	Non-Native (n=15)	1.9	1.8

food type (game, fish, and plants). Game was the most commonly consumed wild food, with 26.8% of participants consuming wild meat at least once per week, followed by 26.8% of participants consuming wild fish at least once per month. Wild edible plants were consumed seasonally by participants (31.7%) with 19.5% of participants consuming wild food plants once or twice a year on special occasions such as holidays and ceremonies.

Bivariate fit analyses revealed linear relationships between food security, Wild Food Procurement, and Wild Food Dietary Diversity (Figure 2). Participants who engaged in a greater number of food procurement activities were more food secure on average than those who engaged in fewer food procurement activities. For example, participants who engaged in two procurement activities such as hunting *and* fishing had a mean food security score of 1.1 (marginal food security), while participants who engaged in only one procurement activity had a mean food security of 2.3 (low food security).

Similarly, participants with greater Wild Food Dietary Diversity scores were more food secure than those with lower Wild Food Dietary Diversity scores. For example, food security scores were improved by 0.33 points for every additional wild food incorporated into the diet. Participants consuming four wild food species had a mean food security score of 1.83 (marginal food security), while participants consuming two wild food species had a mean food security score of 2.49 (low food security).

Figure 1. Commonly Reported Wild Foods Consumed By Participants

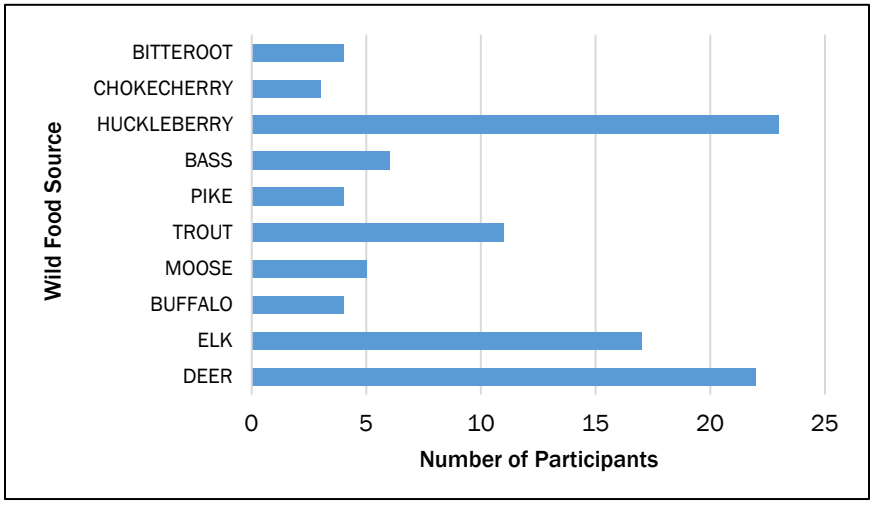
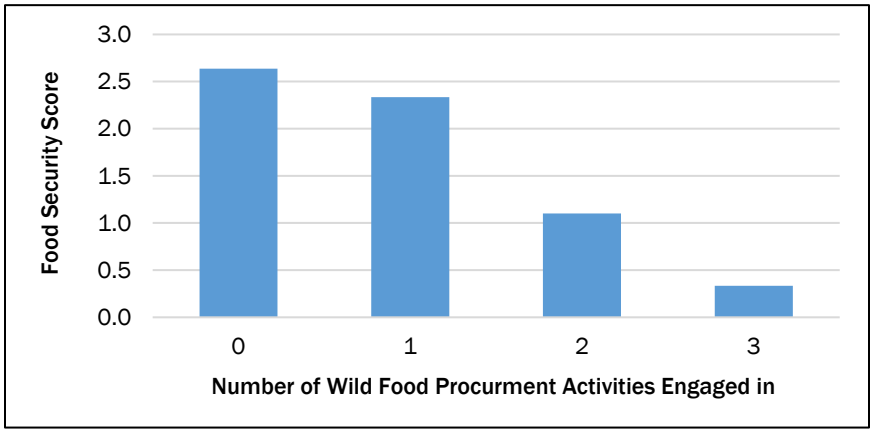


Figure 2. Mean Food Security for Participants Engaging in 0, 1, 2, or 3 Wild Food Procurement Activities

Food Security scores between 0 and 1=high or marginal food security, 2 and 4=low food security, 5 and 6=very low food security.



Wild Food Valuation

While wild foods were not consumed by all participants, wild foods were valued by 90% of participants. The most common themes regarding Wild Food Valuation include (1) quality (n=26), (2) tradition (n=12), and (3) self-sufficiency (n=9). Wild foods were highly valued for various aspects of quality, including taste, freshness, health, and nutritional value (63.4%). Many participants perceived wild foods as being healthier than food from grocery stores or the FDPIR center. Wild foods were further perceived to be of higher quality for not being raised or processed commercially. A share of 21.9% of participants reported that they valued wild edible plants for being pesticide-free and wild game and fish because they do not contain commercially

produced hormones and/or antibiotics. Several participants stated that their health could be improved if they consumed more wild foods. Additionally, some participants expressed dissatisfaction with the quality of foods offered at the FDPIR center and asserted that FDPIR foods negatively impacted their health.

Nearly three-fourths (72%) of participants shared that wild foods were a part of their cultural identity. Both Native and non-Native participants reflected on the contribution of wild foods to their upbringing and shared stories about procuring wild foods with parents and grandparents. In addition, Native participants shared teachings on wild foods that they had learned from elders, such as respecting wild foods by praying before harvesting, 'paying' for food by offering tobacco or other gifts as an act of reciprocity, expressing gratitude, and taking only what you need.

Just over a fifth of participants (21.4%) expressed that hunting, fishing, and foraging provided a sense of self-sufficiency. For example, having knowledge of wild foods was seen as a resource for maintaining food security. Participants discussed the importance of knowing how to acquire wild foods, particularly in times of hardship, and of being able to feed their family if necessary to do so (see Table 2).

Participants' responses to Likert-scale questions regarding Wild Food Valuation further support the themes identified in Table 2, as 88% of participants agreed that consuming wild foods lowers out-of-pocket food costs, 80% agreed that wild foods contribute to dietary diversity, and 72% agreed that wild foods contribute to dietary quality. Both Native (86%) and non-Native (80%) participants expressed concern that younger generations were losing the knowledge and desire to harvest wild foods.

Observations and Concerns Regarding Environmental Change

A share of 81% of participants reported observing changes in temperature, precipitation, and overall

Table 2. Summary of Wild Food Valuation Themes, Subthemes, and Sample Quotations from Participants

Wild Food Valuation		
Research Theme	**Subthemes**	**Sample Quotations**
Theme 1: Quality	Subthemes include aspects of taste, freshness, nutritional quality and health, and knowing where your food comes from.	*"Well I think it's just healthier for us to eat off the land. I would at least say that would be the most valuable is just eating unprocessed foods that are not full of chemicals."*
		"You know I was raised- my parents we hunted, and I went with them and stuff. So, being raised that way with berries and fruits- we used to go berry picking every summer and my family grew a big garden and, I've seen my health take a big nose dive now having those commodities and processed foods and things like that and I think it's- I really think it's part of it."
Theme 2: Self-sufficiency	Subthemes include having knowledge of wild foods for food security and expressing pride for being able to feed oneself and family.	*"I think for me it's the knowledge of knowing how to do it. Because I know how to gather berries and preserve them and, I could survive if I had to."*
		"My family does not go hungry. Yeah- and it tastes excellent."
Theme 3: Tradition	Subthemes include stories about procuring wild foods with family, practicing respect and reciprocity for wild foods.	*"I think it's important to do it because my elders taught me to pray for each food that I harvest, the first one that you get, and pray that you'll be back next year harvesting again."*
		"I always pay for my food, whether that's with tobacco or something else. And I always pray over it and ask it to bring me to the next year, so that I can eat that food again next year, so I'm still here on this earth."

weather patterns during their lifetime, changes in the prevalence of pests and disease (71%), and changes in the prevalence of wildfires (87%). Participants were concerned that changes in climate and land use coupled with overpopulation could decrease the availability of wild foods. Sixty percent of participants noticed changes in the overall availability of wild game, fish, and plants (n=11), and some participants found wild foods harder to find (n=2). Conversely, some participants perceived an increase in the deer population on the reservation (n=4). A share of 30% of participants reported observing changes in wild plant quality or productivity, and 26% reported observing changes in the timing of the harvest season and duration of availability of wild plants.

Open-ended questions regarding climate-related observations and concerns revealed the following themes (Table 3): changes in temperature and timing of seasons (seasonality) and precipitation patterns, increases in wildfire frequency and severity, and a decline in wild food availability. Participants reported that summers were warmer, started earlier, and lasted longer, while winters were 'disappearing,' and that the spring and fall seasons seemed shorter. Participants also expressed observing that weather characteristics were becoming more variable and extreme, and harder to predict from year to year. Participants shared that rainfall was occurring at times throughout the year that were different from usual patterns, with less rain in the summer when it is needed most.

Wildfires were observed to be increasing in frequency and severity in the late summers. Participants attributed an increase in wildfire to the hotter and drier summers. More intense fire seasons were perceived to affect community health due to negative effects on air quality, wild food habitat, and wild food availability. The loss of wild food availability concerned 80% of participants. Many participants noted that wild fish and plants were increasingly hard to find, and some shared stories about the loss of specific foods that they used to harvest. The loss of wild food was

Table 3. Research Themes, Subthemes, and Sample Quotations Regarding Observations of Environmental Change and Wild Foods

Observations of Environmental Change		
Research Theme	**Subtheme**	**Sample Quotations**
Seasonality and Precipitation	Subthemes include warmer and longer summers, increased variability, and changes in rainfall patterns.	*"The concern of the weather pattern is that we are having less moisture in one time of the year and way too much in another time of the year but not too evenly through the whole year."*
		"I've noticed that we get hotter summers with way more heat and periods with no rainfall."
Increase in Fires	Subthemes include an increase in the frequency and severity of fires with negative implications for community health.	*"They're [fires] bigger and burning hotter. They're more out of control than they used to be."*
		"The fires were horrible this year. Breathing was horrible this year. Our health was horrible this year. So hopefully next year will be better but this year was not good."
Loss of wild foods	Subthemes include changes in the availability of wild plants, issues of land use change and overpopulation and tourism.	*"I don't know why but there's a lot less [wild plants] than there used to be… Like down by the river, Jocko river. Used to be like blackberries, they're black caps actually, and all the berries were along there. And now, nobody's really messed with it- why would they- but, [there's] just a lot less."*
		"Because there's so many people going farther out into the footlands and taking up space that normally would be used for food production. You know, there's so many more houses going in on agricultural ground and that all impacts the wild food."

predominately attributed to overpopulation leading to pollution, land-use change, decrease in wildlife habitat, and overharvesting.

Participants expressed multiple concerns, about chronic wasting disease and pine beetle (*Dendroctonus ponderosae*) outbreak. Chronic wasting disease is a transmissible spongiform encephalopathy that causes chronic weight loss and death in members of the deer family, with the first case in Montana occurring in October 2017 (Almberg, Ramsey, Carson & Gude, 2018). Mountain pine beetle is a bark beetle that feeds on various species of pine, and outbreaks are causing widespread tree mortality throughout forests in western North America (Gibson, Kegley, & Bentz, 2009). Some participants were concerned about general environmental toxins and their impact on the health of wildlife; these participants stated that they only hunt in areas where they know the animals are not ill. Participants also noted issues related to water quality linked to environmental contaminants (n=12). A few participants stated they discovered arsenic or lead in their well water.

Discussion

Our study findings highlight the contribution of wild foods to food sovereignty and sustainable food systems through diet, food security, and cultural identity among low-income and food-insecure FDPIR participants on the FIR. The results point to the vulnerability of wild food environments in the face of climate change and other challenges of the Anthropocene, including overharvesting and agricultural encroachment, which are threatening Indigenous food systems. Our findings indicate that wild foods can contribute to strengthening food security and should be promoted through research, education, interventions, and policy changes. No significant differences were found in food security status, wild food valuation, and observations of environmental change between Native American and non-Native American participants. Future research is called for to examine food security, wild food valuation, and climate change observations and concerns between both Native and non-Native residents in other reservation communities.

The consumption of wild foods by residents of the FIR is likely to have positive implications for health given that wild game, fish, and plants are sources of micronutrients and essential fatty acids (Bharucha & Pretty 2010). However, research on micro- and macronutritional properties of wild plant foods lags notably behind research on cultivated species (Vincetti et al., 2008). Further research is thus needed on the nutrient and phytochemical profiles of wild plant foods in order to support their role in diet and health.

Our findings of higher Wild Food Procurement and Wild Food Dietary Diversity scores being associated with lower food security scores are consistent with the literature (Luckett, DeClerck, Fanzo, Mundorf, & Rose, 2015; Powell, Thilsted, Ickowitz, Termonte, Sunderland, & Herforth, 2015). However, Wild Food Dietary Diversity was notably lower in this study than in rural communities in other parts of the world, including Asia, Africa, and South America (Bharucha & Pretty 2010; Cruz-Garcia, Caffi, Zans, & Sanchez-Choy, 2018; Shumsky et al., 2014). The relatively lower wild food dietary diversity among study subjects was expected as market foods make up a substantial portion of the diet in Indigenous communities in North America as compared to Indigenous communities in Asia, Africa, and South America (Compher, 2006). In addition, regional climate and ecosystem type determine the overall availability of wild food dietary diversity. However, research is needed to understand how availability along with other socio-ecological factors influence consumption and utilization of wild foods.

Wild Food Dietary Diversity reported by participants was not representative of wild food diversity available on the FIR, which suggests a loss of knowledge of wild food utilization. For example, recently produced field guides on the FIR provide information on 25 wild plant foods historically utilized by the Bitterroot Salish peoples (Salish Language Revitalization Institute, 2012); however, in this study, only six wild plant foods were identified by participants. Comprehensive documentation and dissemination of wild food identification, uses, and preparation techniques are needed to prevent the loss of knowledge of wild foods on the FIR (Bortolotto et al., 2017).

The multidimensional valuation of wild foods for quality, self-sufficiency, and tradition touches upon multiple aspects of sustainable food systems and is consistent with value systems reported in the literature associated with traditional foods among Native Americans (Cozzetto et al., 2013). Our findings suggest that there is a need for culturally appropriate and nutritious wild food offerings in FDPIR settings. Perceptions of diminished health resulting from consumption of FDPIR foods is consistent with previous studies that note that the FDPIR historically has provided culturally inappropriate food to Native peoples (Compher, 2006; Kuhnlein & Receveur, 1996) as well as nutritionally inadequate food (Byker Shanks et al., 2015). Examination using the Healthy Eating Index 2010 (HEI-2010) of foods offered by FDPIR found that the mean offerings of fruit, vegetable, greens and beans, protein, and refined grains did not adhere to recommendations by the U.S. Dietary Guidelines (Byker Shanks, 2015). U.S. federal policy efforts to promote food security among tribal communities are seen as undervaluing the contribution of wild foods to wellbeing (Olson, 2002). Future evidence-based interventions should focus on enhancing the availability of culturally appropriate and nutritious food in the FDPIR.

Participant observations of climate change are consistent with the Montana Climate Assessment (Whitlock et al., 2017). Observations of shifts in precipitation patterns are in line with the assessment, which demonstrates that changes in precipitation patterns are affecting snowpack and water availability and increasing the severity of wildfires in the region (Whitlock et al., 2017). However, participants generally attributed the observed decrease in wild food availability to increased population, agricultural encroachment, overharvesting, and land-use change, and less so to climate change. Agricultural encroachment on wildlife habitat and overharvesting by humans are recognized as key drivers of wild food system change (Bharucha & Pretty, 2010).

Participants' observations of increasing pests and diseases, including chronic wasting disease (CWD) and mountain pine beetle, were interpreted as presenting a threat to wild game populations. This is particularly concerning given that wild game is the most commonly consumed wild food among participants. While there are no documented cases of CWD being contracted by humans, similar diseases exist in cattle and other food species (Almberg et al., 2018). Public health, wildlife management, and agriculture agencies all recommend testing animals harvested in areas of known prevalence, which requires driving to a state surveillance check area (Almberg et al., 2018). While there are no known cases of CWD on the FIR, infected deer have been found about 200 miles (320 km) away (Montana Fish, Wildlife, and Parks, 2018). Recommendations for dealing with CWD-positive animals include not eating them, which could result in reductions in both wild game consumption and food security. Additionally, the loss of canopy cover due to mountain pine beetle outbreak reduces the ideal habitat for large-bodied ungulates who use forest cover to regulate their body temperature (Gibson et al., 2009). Reductions in elk and moose populations could occur if their habitat is limited to forests with prevalent pine beetle outbreak (Gibson et al., 2009).

This study highlights the need for future research, education, evidence-based interventions and policies to enhance wild food environments in the face of climate change, particularly among vulnerable communities (Bharucha & Pretty, 2010; Cordalis & Suagee, 2008; Lynn et al., 2013). Research is needed to determine the ecological carrying capacity for supporting wild food harvest on the FIR, as well as the effects of increased wild food consumption on supporting health outcomes. Identifying areas where encroachment and overharvesting are occurring, coupled with wild food harvesting policies and education initiatives, could mitigate the negative impacts of unsustainable resource use. Wild food education initiatives are needed to enhance knowledge of wild foods while promoting their sustainable harvest. Policy support is further called for to promote and monitor sustainable harvest of wild foods, including efforts that prohibit wild food collection in areas that have experienced overharvesting, particularly in locations where tourists harvest on public lands. Monitoring of wild food environments over time coupled with

local meteorological data can provide insight into the effects of climate change on wild food systems that are currently unknown.

Conclusions and Recommendations

Wild foods were found to contribute to resilient and sustainable food systems on the FIR by supporting health, cultural, economic, and environmental well-being. Wild foods were associated with improved food security among low-income FDPIR recipients and valued for taste, nutritional quality, empowering self-sufficiency, and for being a food practice linked to cultural heritage for both Native and non-Native study participants. Participants perceive that variation in precipitation, seasonality, extreme weather events, and wildfires is threatening wild food environments, along with other challenges of the Anthropocene that include overpopulation, pests and disease, and land-use change such as agricultural encroachment.

Wild food environments have the potential to facilitate strengthening food system resilience, especially during times when incomes or access to market foods is limited. At the same time, wild foods are more vulnerable than market foods to local environmental disturbances. Local governments can play a crucial role in promoting and protecting wild foods through conservation and monitoring initiatives along with resilience planning for wild food environments. In support of sustainable food systems, these efforts should be fortified by enhancing community knowledge about wild foods, wild food carrying capacity, sustainable harvesting, and the effects of environmental change.

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Appendix A: Food Environment Interviews

Researcher Introduction: Hello. My name is [facilitator's name] and I'm part of a team of researchers from [blinded for review]. In these interviews, we are trying to better understand how wild foods and the natural food environment are part of the local food system. There is no right or wrong answer to the questions I'll ask, and you don't have to respond to any question that makes you feel uncomfortable. Please say what you think, we are respectful of your opinion. The interview will be audio recorded and transcribed. No one's name or personal identifying information will appear on any reports that we write about this project. Do you have any questions before we start?

Interview Part 1: Wild Foods

In this interview, we will ask about your practices, values, and perceptions regarding wild foods including hunting, fishing, and wild edible plants.

A. Wild Food Practices

(1) *Hunting*

a. Do you hunt?

i. *If the informant does not hunt:* Does anybody in your household hunt?

ii. *If the informant hunts:* Who taught you how to hunt, or where did you learn how to hunt?

b. **Free-listing:** What are all the type of animals that [you or someone in your household] hunt?

Prompt: Do [you or someone in your household] hunt anything else?

c. Which animals do you hunt the most?

d. Approximately how often do you consume the meat that you or somebody else in your community hunted?

i. *Prompt:* Once a week? More than once a week? Once a month? In a certain season of the year?

(2) *Fishing*

a. Do you fish?

i. *If the informant does not fish:* Does anybody in your household go fishing?

ii. *If the informant fishes:* Who taught [you or someone in your household] how to fish, or where did you learn how to fish?

b. Free-listing: What are all the type of fish that [you or someone in your household] harvest? *Prompt:* Do [you or someone in your household] harvest any other types of fish?

c. Approximately how often do you consume the fish that [you or someone in your household] harvest?

i. *Prompt:* Once a week? More than once a week? Once a month? In a certain season of the year?

(3) ***Wild edible plants***

a. Do you harvest wild plant foods (wild edible plants)?

i. *If the informant does not harvest wild plant foods:* Does anybody in your household harvest wild plant foods?

ii. *If the informant fishes:* Who taught [you or someone in your household] about wild edible plants, or where did you learn about wild edible plants?

b. Free-listing: What are all the types of wild plant foods that [you or someone in your household] harvest? *Prompt:* Do [you or someone else in your household] harvest any other types of wild plant foods?

c. Which wild plant foods do [you or someone else in your household] harvest the most?

d. Approximately how often do [you or someone else in your household] consume the wild foods that you harvest?

i. *Prompt:* Once a week? More than once a week? Once a month? In a certain season of the year?

B. Wild Food Valuation

(1) Free-listing: What are all the things that you value about ***hunting***? *Prompt*: Do you value anything else?

(2) Free-listing: What are all the things that you value about *fishing*? *Prompt*: Do you value anything else?

(3) Free-listing: What are all the things that you value about *harvesting* wild plant foods? *Prompt*: Do you value anything else?

(4) Free-listing: What are all the things that you value about *eating* wild foods? *Prompt*: Do you value anything else?

(5) Free-listing: Are harvested wild foods shared among the community?

a. *Prompt:* At events? Among neighbors, co-workers, or friends?

(6) Free-listing: Who prepares different types of wild foods? Do [you or someone in your household] have specific recipes that you use to prepare these wild foods? Where did the recipes come from?

Thank you for your time and sharing your experiences. We are interviewing several community members and will make the results available to you, if you are interested. If you would like to see the results, please provide your e-mail address or home address where we can send them to. Please follow up with any questions you may have.

Interview Part 2: Wild Food Perceptions

In this interview, I will present several statements about wild foods. For each statement, you are requested to share how strongly you agree or disagree with each statement.

(1) "Eating wild foods contributes to the overall *quality* of my diet."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

(2) "Eating wild foods contributes to the overall *diversity* of my diet."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

(3) "Collecting and/or eating wild foods is part of my cultural identity. It connects me to my ancestors and our stories."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

(4) "I am concerned that the younger generations of our community are losing the traditional knowledge about wild foods."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

(5) "I am concerned that the younger generations of our community are losing the desire to collect and/or consume wild foods."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

(6) "Consuming wild foods lowers the cost of my diet."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why do you feel this way?

Thank you for your time and sharing your experiences. As we mentioned earlier, if you would like to see the results, please provide your e-mail address or home address where we can send them to. Please follow up with any questions you may have.

Interview Part 3: Environmental Change

In this interview, I will ask about your observations and perceptions regarding your surroundings and observed changes.

A. Environmental Observations

In the past decade, have you *observed* any changes in the following:

(1) Overall *availability* of wild game, fish, or wild plant foods

Prompts: [If the informant responds yes] What changes have you observed? Do you have to travel further to go hunting or to harvest wild foods?

(2) The *harvest times and / or harvest duration* of wild edible plants

Prompt: [If the informant responds yes] What changes have you observed?

(3) The *quality* and / or productivity of wild edible plants

Prompt: [If the informant responds yes] What changes have you observed?

(4) Temperatures, precipitation, and overall weather patterns (i.e., rainfall and snowfall)

Prompt: [If the informant responds yes] What changes have you observed?

(5) The prevalence of *fires*

Prompt: [If the informant responds yes] What changes have you observed?

(6) The prevalence of *pests and disease*

Prompt: [If the informant responds yes] What changes have you observed?

B. Environmental Perceptions: *You are requested to share how strongly you agree or disagree with the following statements.*

(1) "I am concerned about land-use changes in and around our community."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: Why are you concerned?

(2) "I am concerned that in the future there may be decreasing availability of wild foods."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: [If the informant agrees] Why are you concerned?

(3) "I am concerned with the water quality in our community."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompts: [If the informant agrees] Why are you concerned? What is your water source? Do you trust your water source? Does your water have a pleasant or unpleasant smell? Is your water discolored?

(4) "I am concerned with the water rights in our community."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: [If the informant agrees] Why are you concerned?

(5) "Changes in weather patterns are impacting the well-being of our community."

a. Strongly agree

b. Somewhat agree

c. Neutral

d. Disagree

e. Strongly disagree

Prompt: [If the informant agrees] Why are you concerned?

Thank you for your time and sharing your experiences. As we mentioned earlier, if you would like to see the results, please provide your e-mail address or home address where we can send them to. Please follow up with any questions you may have.

Interview Part 4: Protecting Tribal Resources

(1) What are your suggestions for protecting tribal *food* resources?

(2) What are your suggestions for protecting tribal *water* resources?

(3) What are your suggestions for protecting tribal *land* resources?

(4) Do you have any special practices, rituals, or stories associated with hunting?

(5) Do you have any special practices, rituals, or stories associated with fishing?

(6) Do you have any special practices, rituals, or stories associated with harvesting wild foods?

(7) Is there anything you would like to add about wild foods or your environment such as water resources?

Thank you for your time and sharing your experiences. As we mentioned earlier, if you would like to see the results, please provide your e-mail address or home address where we can send them to. Please follow up with any questions you may have.

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Increasing fruit and vegetable intake with reservation and off-reservation kindergarten students in Nevada

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Abstract
American Indian tribes historically survived on hunting, gathering, and farming activities. As federal policy changed, reservations were established, which limited some of these hunting and gathering activities. Nevada is home to Washoe, Shoshone, and Paiute American Indians. There are 19 federally recognized American Indian tribes with 27 reservations and colonies geographically dispersed across the state of Nevada. Several of these reservations are near Nevada's small, rural towns where access to fruits and vegetables is limited. Often, the residents of small rural towns next to the reservation are unaware of the tribal cultural history. University of Nevada Cooperative Extension created an elementary nutrition education program called Veggies for Kids, for use in reservation schools and off-reservation schools under the U.S. Department of Agriculture (USDA) Supplemental Nutrition Assistance Program–Education (SNAP-Ed). The Veggies for Kids program utilizes traditional foods, tribal language, and gardening experiences as building blocks to introduce healthy eating and increase fruit and vegetable intake among elementary students. For the 2017–2018 school year, pre- and post-test data were collected from 45 American Indian kindergarten students attending schools on reservations and 486 kindergarten students in off-reservation schools located next to a reservation. Methods of data analysis included descriptive statistics, paired sample t-tests, and

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nonparametric McNemar testing. Results from the kindergarten data showed an increase in test scores of students correctly identifying USDA's MyPlate food groups, naming selected fruits and vegetables provided during the program, self-reporting water consumption, and selecting physical activity. Cumulative student test scores for all kindergarten data were statistically significant at *p*-value <.001.

Keywords
American Indian (AI), Vegetables, Fruits, Traditional Food, Native Language, SNAP-Ed, Schoolchildren, Nutrition, School Gardens

Introduction and Literature Review

Food sovereignty, in its truest sense, is the ability of a population or person to dictate what is a culturally, ecologically, and sustainable food source and to define their own food and agricultural systems. American Indian Tribes in the United States theoretically should be able to do this. The reality is that it does not happen quickly. Federal policy regarding American Indians in the U.S. has perpetuated a dependency for food access. Historically, this has increased the amounts of processed foods available through commodity programs. At the same time, land policies have limited access by American Indians to lands that are rich in traditional foods such as wild berries, onions, carrots, venison, elk, groundhog, and ground squirrels. There are some Tribes in Nevada fighting for true food sovereignty; however, it is a difficult road as most are dependent upon federal programs and funding with dictated regulations and food sources. Nevada tribes do not want their native language and the knowledge of traditional food sources to disappear. This paper discusses a program that was created with Nevada tribes under Nevada's Supplemental Nutrition Assistance Program–Education (SNAP-Ed) as a first step toward increasing the knowledge of youth regarding traditional foods and tribal language, while recognizing the federally mandated MyPlate nutrition guide with recommended portions of fruits, vegetables, protein, dairy, and grains.

There are Paiute, Shoshone, and Washoe Indians in Nevada that represent 19 federally recognized tribes and 27 reservations and colonies. Each tribe in Nevada has a unique story. The Paiute people are made up of many different bands of Indians who historically were located across a large part of the western U.S. The Paiute call themselves "Numu," meaning "The People." In Nevada, there are Southern Paiute and Northern Paiute. The Southern Paiute, prior to contact with Europeans, occupied more than 30 million acres (12 million hectares) of present-day southern California, southern Nevada, south-central Utah, and northern Arizona. The Northern Paiute in Nevada lived in several bands that spanned Oregon, California, Nevada, and Idaho.

The Western Shoshone Indians are "Newe," also meaning "The People," with a traditional territory covering southern Idaho, the central part of Nevada, northwestern Utah, and the Death Valley region of southern California. The Western Shoshone historically survived by hunting, gathering, fishing, foraging, and some farming. There are four federally recognized tribes that are both Northern Paiute and Shoshone.

For the majority of the Nevada Tribes, land was purchased, set aside, or allocated by the federal government for the Indians living in the area. In other cases, officials relocated groups of Indians to a particular land base. This resulted in Paiute and Shoshones making up one tribe located on a specific Nevada reservation.

The Washoe Tribe of Nevada and California is located in western Nevada and eastern California around Lake Tahoe. The tribe is made up of five bands and resides on about 10 separate tracts of land. The Washoe people call themselves "Wašiw" (Washoe Tribe of Nevada and California, 2009).

Most tribes in Nevada participated in hunting, gathering, and farming to provide for a remarkably holistic and diverse food supply. This traditional diet was a mix of plants and animals that are not characteristic of today's modern diet. The tribes use a distinctive traditional knowledge passed down through elders that integrates a spiritual connection to food and the land (Milburn, 2004).

The reservation era in the U.S. commenced in 1850, and reservations in Nevada were created between 1886 through 1939. As the land bases were established for Nevada Tribes, tribal members' access to hunting and gathering areas became

limited. In addition, there were not always water resources available for farming (Emm & Singletary, 2009). It became more difficult to maintain a diet from traditional food sources. Federally recognized tribal status of these reservations resulted in access to a federal commodity food program, the Food Distribution Program on Indian Reservations (FDPIR), that was introduced in 1977.

Before and at the same time reservations were being established, the gold rush brought prospectors to Nevada, while the Homestead Act brought farmers and ranchers who settled territory. The diet of the settlers was based on what they had access to, which was mostly plants (berries, wild onions, pine nuts) and animals (deer, groundhog, ground squirrel, and fish). Individuals living in rural Nevada communities that border reservations or are in close proximity to the reservations usually have a connection to the reservation in some way. This can be both a positive or negative connection, as it brings two different worlds together, the Indian and the non-Indian. Food systems do not always stop at reservation boundaries and are not always based on ethnic differences, but rather by food access. For this reason, there was an opportunity in Nevada to bridge the gap between on-reservation nutrition education and off-reservation nutrition education based on food access, especially fruits and vegetables.

FDPIR, also known as "commodities," is part of the standard of living on most reservations, as all tribes in Nevada participate in the program. Commodity cheese and flour are a regular part of the Nevada tribal diet, but were not part of the traditional foods systems of these tribes. Research that assessed the Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) indicates that WIC food vouchers have a significant effect on the behavior of children who participate in the program eating processed foods (Companion, 2013). Revising the WIC food vouchers to allow the purchase of fruits, vegetables, and whole grains led to increased consumption of healthful foods among American Indian children (Companion, 2013). This raises questions regarding access to foods among American Indians, and whether access determines diet. Food consumption among poorer populations and American Indians mirrors that of nutritional evolution dominated by access to prepackaged foods high in fat, sugar, sodium, and with an extended shelf life (Companion, 2013).

The Veggies for Kids kindergarten curriculum created in 2013 by the University of Nevada Cooperative Extension utilizes traditional American Indian knowledge of foods and language to increase fruit and vegetable intake among kindergarten students attending schools on a reservation or near a reservation. Most children of tribal members attend the rural local schools next to the reservations; only three elementary schools are on Nevada reservations.

A 2004 study of leading health education teachers indicated that in-classroom programs improved dietary behavior, increased physical activity, and reduced sedentary behavior (U.S. Centers for Disease Control and Prevention, 2006). In-school nutrition education programs integrated into the overall health and wellness of a school promote the consumption of healthful foods (McKenna, 2010). The Veggies for Kids program was created by integrating U.S. Department of Agriculture guidelines (U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2015) and the traditional knowledge of Nevada participating Tribes: the Walker River Paiute, Pyramid Lake Paiute, and Duck Valley Paiute and Shoshone. Funding for Veggies for Kids has come from SNAP-Ed. The core goals of the Veggies for Kids program are:

- Reinforce the importance and integration of nutrition education in schools, with lesson content linked to Nevada education standards.
- Promote adequate intake of vegetables and fruits through increased exposure to them.
- Promote the use of water and low-fat milk as preferred beverages over sweetened beverages.
- Promote daily physical activity.
- Reinforce American Indian cultural connections to traditional health, promoting behavior through the use of traditional foods, food gathering, and Paiute and Shoshone translations.

- Provide an introduction to gardening through in-class experiences and school gardens.
- Engage parents through take-home assignments.

Traditional foods, food gathering, and tribal language are reinforced by having tribal elders participate in the program. Tribal elders go into the schools for a cultural day and talk about the traditional foods that were and are available, how they are harvested, and how they are used. Native languages are based on descriptors. For this reason, colors of fruits and vegetables were translated with tribal words for root, fruit, and sprout (so apple is translated as "red fruit," for example). In addition, there were tribal translations for muscles, mind, lungs, and heart for growing strong. There are also lessons on gardening and growing your own vegetables.

A policy, systems, and environmental (PSE) approach is taken with Veggies for Kids, since classroom instruction is only one part of a school's coordinated efforts. The curriculum encourages gardening activities and is combined with a school or community garden. This includes the use of seasonal extensions such as a hoop house. Teachers, students, and community volunteers were encouraged to participate in growing traditional native foods. "Smarter Lunchroom"[1] activities were created to encourage students to drink more water instead of sugar-sweetened drinks. Program banners were put outside the school so that communities can recognize a Veggies for Kids school.

Modern diets are described as calorie-dense and nutrient-poor, while traditional indigenous diets are described as nutrient-rich and calorie-limited (Milburn, 2004). For example, wild game is higher in many nutrients and leaner than domesticated meats. It is important to introduce the concept of farm to fork to teach students that their food does not originally come from the grocery store. Closing the gap and eliminating the distance between growing and eating food is an important concept reinforced in the Veggies for Kids program.

Through diverse methodology, the Veggies for Kids program attempts to support positive behavioral change through in-classroom education and environmental change based on food access. Raising youth awareness of MyPlate, fruits and vegetables, water consumption, and physical activity contributes to the ongoing national efforts to promote healthful diets and healthy weight (Office of Disease Prevention and Health Promotion [ODPHP], 2019). Introducing students to Paiute and Shoshone traditional food such as wild onions, buck berries, and pine nuts brings the current and past worlds together. However, the program is restricted in bringing traditional foods into the classroom, due to health regulation, because they are not prepackaged. For this reason, the curriculum evaluation measures foods that students have access to both on and off the reservation.

Applied Research Methods

The Veggies for Kids program has been practice-based under SNAP-Ed for several years, and the authors are working on getting the program to be evidence-based. The University of Nevada, Reno Institutional Review Board (IRB) has reviewed the pre-test and post-test evaluation instruments, parent letters, and passive consent forms sent home with students. Pre- and post-tests were used for data collection and analysis, while the parent letters were sent out by the school to notify parents about the program and to ask about student allergies. The passive consent forms also were sent home with students; parents needed to sign and return the form to opt their child out of the program.

The Veggies for Kids program utilized a pre/post survey methodology to collect data at the beginning of the program and again at the end of the program. The pre- and post-tests are identical. The tests were printed and distributed to each instructor to begin their program. All instructors were trained on how to implement the pre-test and post-test surveys to kindergarten students. Consistency in language and survey methods was essential for obtaining accurate data.

[1] The Smarter Lunchrooms Movement is a program under SNAP-Ed to utilize research-based practices to get children to eat healthy meals, increase their vegetable and water intake, etc.

Each of the participating 13 school sites began week one with a student pre-test, followed by 12 consecutive weekly lessons, and ended with a post-test after the twelfth lesson. Testing was conducted individually, with each student tested and observed outside the classroom or in a quiet location within the classroom. The test was proctored by the trained Veggies for Kids instructor, and all questions were asked and responses written by the instructor. Each individual testing session took between five and 10 minutes to complete, depending on the student's skill set.

Students were asked to identify the five food groups of MyPlate. Students were also asked to name six selected fruits and vegetables that were seen and tasted during programming. They were asked to state their preference or likability for each of these six fruits and vegetables. To identify water consumption, students were asked to recall how many drinks of water they took the day prior. This included identifying drinks at home, at school, in the lunchroom, and at a drinking fountain.

"Play hard" is a term introduced in the program that has the same definition as physical activity. Students were asked to choose two photos that demonstrated play hard activities in the pre- and post-test. The instructors observed the students to see if they select two "playing hard" photos or if they chose a sedentary behavior, which determined if the student understood the term "play hard."

Impact data obtained from the kindergarten pre- and post-tests were analyzed using Statistical Package for the Social Sciences (SPSS, 2018) to measure short-term knowledge gains. All student responses, aside from water consumption, were dichotomized as correct versus incorrect, and individual questions and cumulative questions scores were calculated. Cumulative pre- and post-test mean scores were calculated using a paired samples t-test. Individual question percent correct scores were provided through descriptive statistics, while individual question pre- and post-test mean scores were calculated using nonparametric McNemar tests. Answers, whether correct or incorrect, were not discussed with the students after testing; however, if a vegetable or fruit was identified incorrectly by the student, they were told the correct name to ensure their response to the subsequent "have you tasted it before" questions were valid.

The majority of American Indian students who participated in the 2017–2018 Veggies for Kids program were in higher grades, but 45 American Indian kindergarten students participated in the program. The data reflect kindergarten analysis only, to assess the efficacy of the kindergarten curriculum. Descriptive statistics were run to demonstrate percent correct for pre- and post-tests questions. Paired sample t-tests were performed for pre- and post-test cumulative data. Scores from the MyPlate recognition question, MyPlate food group naming questions, vegetable and fruit identification, willingness to try questions, and play hard question were compiled. Paired sample t-tests produced pre- and post-test mean scores, mean differences, and 2-tailed *p*-values for cumulative kindergarten scores. With an alpha of .05, McNemar tests were performed to assess whether a statistically significant change occurred for each dichotomous question (19 in total) between pre- and post-testing.

Results

Pre- and post-test data were collected from 45 American Indian kindergarten students attending schools on reservations and 486 kindergarten students in off-reservation schools located next to a reservation. The cumulative pre- and post-test mean scores, mean differences, and 2-tailed *p*-values produced from paired sample t-tests are provided in Table 1 for off-reservation kindergarten students and on-reservation American Indian kindergarten students. For off-reservation kindergarten students (n=486), the mean difference between scores was 6.17, and for on reservation American Indian kindergarten students (n=45), the mean difference was 6.02. *P*-values <.0001 were observed for off-reservation kindergarten students and American Indian kindergarten students.

At the beginning and end of the in-classroom direct education program, students were shown a graphic of USDA's MyPlate and asked if they had seen the graphic before. Pre-test data, for off-reservation kindergarten students, showed that 38% of students self-reported that they had seen the graphic before, while post-test data showed that 91% of students self-reported they had seen

Table 1. Mean Score, Mean Difference, and *p*-values from Paired-Sample T-Tests for On-reservation and Off-reservation Kindergarten Students

Paired Sample T-Test	*n*	Pre-test Mean (SD)*	Post-test Mean (SD)*	μd**	*p*-value
Kindergarten Students	486	7.62 (2.35)	13.79 (3.16)	6.17	.0000
American Indian Kindergarten Students	45	8.02 (2.45)	14.04 (3.32)	6.02	.0000

* SD=standard deviation; ** μd=difference of means

Table 2. Comparison of On-reservation Kindergarten Students and Off-reservation Kindergarten Students Correctly Identifying MyPlate Food Groups

	On-reservation Kindergarten (*n*=45)		Off-reservation Kindergarten (*n*=486)	
MyPlate Food Group	Pre-test	Post-test	Pre-test	Post-test
Fruits	.044	.822	.035	.741
Vegetables	.044	.756	.029	.743
Protein	.000	.622	.008	.516
Grains	.000	.622	.008	.510
Dairy	.044	.733	.012	.708

the graphic after completion of the 12 in-school lessons. For the American Indian kindergarten data, the same MyPlate recognition question was asked, with pre-test results showing 47% of students self-reporting that they had seen the graphic before, and post-test results showing 87% of students had seen it after the in-school lessons. For both cumulative kindergarten and American Indian–specific data, McNemar tests for MyPlate identification were statistically significant at a *p*-value <.001.

Table 2 shows the percentage of off-reservation kindergarten students who could correctly name the five MyPlate food groups from pre-test to post-test. Pre-test scores ranged from 0.8% to 4.0% correct, while post-tests scores ranged from 51% to 74% correct. Table 2 also shows the percentage of on-reservation American Indian kindergarten students who could correctly name the five MyPlate food groups between pre- and post-test. Pre-test scores ranged from 0% to 4% correct, while post-tests scores ranged from 62% to 82% correct. McNemar tests for each food group indicator were statistically significant at $p<.001$ for off-reservation kindergarten students and American Indian kindergarten students.

Table 3 shows the percentage of kindergarten students who correctly named selected fruits and vegetables before and after the in-school instruction. Of the 12 questions (naming and willingness to try six selected fruit and vegetables), all except two had statistically significant results between pre- and post-test at *p*-values <.001.

Table 4 shows the percentage of American Indian students who correctly named selected fruits and vegetables before and after the in-school instruction. Of the 12 questions (naming and willingness to try six selected fruit and vegetables), only asparagus, blueberry, squash, lemon, and spinach identification questions and the tasting of squash question were statistically significant at $p<.01$.

Play hard results were measured for all kindergarten students. The play hard percent correct for pre- and post-tests for off-reservation kindergarten students were 60% and 91%, respectively. The play hard percent correct for pre- and post-tests for American Indian kindergarten students were 64% and 78%, respectively.

For off-reservation kindergarten students, self-reported daily water consumption at pre- and post-test for 0–4 drinks per day were 46% and 32%; 5–10 drinks per day were 29% and 33%; 11–15 drinks per day were 9% and 9%; and 16+ drinks per day

Table 3. Off-reservation Students Able to Correctly Name and their Willingness to Try Selected Fruits and Vegetables

Correctly Naming Fruits and Vegetables (*n*=486)	Pre-test	Post-test	*p*-value
What is the name of Asparagus?	.080	.290	.0000
Have you tasted it before?	*.393*	*.720*	*.0000*
What is the name of Blueberry?	.755	.897	.0000
Have you tasted it before?	*.844*	*.914*	*.0004*
What is the name of Squash?	.095	.479	.0000
Have you tasted it before?	*.379*	*.739*	*.0000*
What is the name of Lemon?	.685	.854	.0000
Have you tasted it before?	*.815*	*.870*	*.0076*
What is the name of Spinach?	.082	.233	.0000
Have you tasted it before?	*.597*	*.856*	*.0000*
What is the name of Strawberry?	.899	.967	.0000
Have you tasted it before?	*.924*	*.936*	*.4881*

were 14% and 26%, respectively. For on-reservation kindergarten students, daily water consumption at pre- and post-test for 0–4 drinks per day were 51% and 43%; 5–10 drinks per day were 36% and 33%; 11–15 drinks per day were 2% and 2%; and 16+ drinks per day were 11% and 20%, respectively.

Discussion

By utilizing traditional foods and tribal language, Veggies for Kids lays the foundation to introduce nutritional concepts and support positive behavior change among kindergarten students in rural areas of Nevada, either on- or off-reservation. The Veggies for Kids program effectively meets its goals aimed at increasing fruit and vegetable recognition, water consumption, and physical activity based on evaluation of the program. Future work will focus on traditional foods available in the areas and evaluating students' increased knowledge of traditional foods on and off the reservations.

Results from the 2017–2018 data indicate sig-

Table 4. On-reservation Students Able to Correctly Name and Their Willingness to Try Selected Fruits and Vegetables

Correctly Naming Fruits and Vegetables (*n*=45)	Pre-test Correct	Post-test Correct	P-value
What is the name of Asparagus?	.022	.267	.0010
Have you tasted it before?	*.556*	*.600*	*.8036*
What is the name of Blueberry?	.622	.889	.0042
Have you tasted it before?	*.844*	*.889*	*.7266*
What is the name of Squash?	.200	.600	.0001
Have you tasted it before?	*.511*	*.778*	*.0042*
What is the name of Lemon?	.622	.911	.0010
Have you tasted it before?	*.733*	*.800*	*.5488*
What is the name of Spinach?	.089	.378	.0002
Have you tasted it before?	*.644*	*.800*	*.0654*
What is the name of Strawberry?	.978	1.00	1.0000
Have you tasted it before?	*.956*	*.933*	*1.0000*

nificant knowledge gains across multiple indicators for off-reservation kindergarten students and American Indian kindergarten students. There was a statistically significant increase in knowledge of students recognizing the image of MyPlate. The difference in pre- and post-test percent correct scores for the MyPlate recognition question were 52% and 40% for off-reservation kindergartners and American Indian kindergartners, respectively. The difference in pre- and post-test scores indicate that the Veggies for Kids classes were effective in raising awareness and recognition of USDA's MyPlate. Additionally, statistical significance was observed with students correctly naming the five MyPlate food groups.

Identifying the MyPlate food groups encourages healthy behavior and increases student awareness of the foods they eat and their nutritional value. Student ability to name six selected fruits and vegetables increased between pre- and post-testing. Off-reservation students had statistically significant results for all six fruits and vegetables, indicating that the program successfully affected student recognition and short-term knowledge gains. For the American Indian students, all selected fruit and vegetable scores, except strawberries, increased statistically between pre- and post-testing,. The results show that recognition of selected fruits and vegetables that were introduced during programming increased among kindergarten students at both reservation and off-reservation schools. These data suggest that raising the awareness of fruits and vegetables increases the likelihood of future consumption and further encourages healthy eating behavior.

In conjunction with increased awareness of MyPlate and selected fruits and vegetables, student awareness of physical activities increased. Off-reservation kindergarten students had a 31% difference between pre- and post-testing, while American Indian kindergarten students had a 13% difference, indicating increased short-term knowledge gains. While on-reservation kindergarten results were not statistically significant ($p>.05$), the percent difference shows that students' ability to select physical activity photos over sedentary photos increased. Recognizing physical activities is practically significant, as it contributes to increased physical activity and knowledge of healthful behaviors.

Water consumption was also tested. Pretest results showed that students selected the lowest water consumption answer (0–4 drinks per day) more frequently than any other option, 46% and 51% for off-reservation kindergarten students and American Indian kindergarten students, respectively. Post-test results showed a lowered selection of 0–4 drinks per day and increased selection of 16+ drinks per day. The difference in results indicates that students were self-reporting a higher consumption of water at post-testing. Increased water consumption has the potential to influence other beverage choices, but more importantly reflects an increase in healthy behavior. Water consumption is essential for growth and development and is an important goal of the Veggies for Kids program. Current research on the program continues to focus on the most appropriate way to evaluate water consumption as there are limitations with asking youth to self-report water intake.

Conclusion

Data analysis of the 2017–2018 Veggies for Kids kindergarten results indicate that the program was effective in raising student knowledge of MyPlate, selected fruits and vegetables, physical activity, and influencing water consumption among both off-reservation kindergarten students and on-reservation American Indian kindergarten students. The achievement of program indicators corresponds to one of the Healthy People 2020 goals, which aims to promote health and reduce chronic disease risk through the consumption of healthful diets and achievement and maintenance of healthy body weights (ODPHP, 2019).

The Veggies for Kids programming efforts aim to influence environmental change in the classroom and improve overall school health. Environmental change is related to access and what the students have available to them. The Veggies for Kids program is able to continue the goals of Healthy People 2020 for rural Nevada students by supporting healthful diets and physical activity opportunities.

There are a few potential limitations that could have affected the findings from these analyses. First, county nutrition policies could have limited

the abilities of each nutrition instructor. Some school districts implemented sugar policies and exemptions that could have affected the child behavior choices reflected in our testing. This means that a student's decision to drink a sugary beverage at school may have been affected by policy rather than direct programming. Second, testing fidelity among nutrition instructors could have been compromised, as the majority of instructors both taught the students and collected data. Testing fidelity was expected, and detailed testing instructions were provided in-person and via phone; however, tests were unsupervised, which could allow for infidelity. Third, curriculum fidelity, in the same manner, may have been a problem. With 13 schools across four counties, teaching was anticipated to vary slightly; however, it was impossible to supervise all teachers, leading to potential curriculum fidelity problems. Finally, the team is always looking for improved ways of evaluating the efficacy of the program. Self-reporting is seen as the most effective way at this time, but this evaluation method could change over time.

It is unlikely that limitations would drastically change the results of the findings. A randomized control intervention is being conducted for the 2018–2019 school year among kindergarteners in one Nevada county. The randomized control intervention will provide identical data, which will be used for comparative analyses and further evaluations into the effectiveness of the kindergarten curriculum content. It is anticipated that the findings from the randomized control intervention will mirror the results of the 2017–2018 kindergarten data.

The program team will continue to work with traditional food access and overall food access for reservation and rural communities in Nevada. The team continues to work with school districts in educating administrators, cooks, teachers, and students about traditional foods and how they can be gathered in a safe way to ensure food safety. The program is also expanding funding sources so that it is not tied only to SNAP-Ed requirements. This will allow the program to expand and be focused more on traditional foods, language, tribal food access, and tribal food sovereignty.

Future evaluation needs to address schools and local grocery stores integrating traditional foods, such as buck berries, pine nuts, and venison, into school activities and the wider food systems. This is an environmental change that needs to occur with work through USDA school lunchroom guidelines and tribal governments. In addition, research needs to be done on the increase of knowledge of traditional foods, and what impact that has on communities, such as diabetes and/or obesity rates.

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Kaʾtshatstʌ́sla: "Strength of belief and vision as a people"—A case study of Oneida resilience and corn

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Abstract

The collective nations of the Haudenosaunee are governed by their shared ancestral knowledge of creation. This storied knowledge tells of an intellectual relationship with corn that has been cultivated by the Haudenosaunee through generations and represents core values that are built into community resilience, for the benefit of future generations. The Oneida, members of the Haudenosaunee Confederacy, have been committed to this relationship since the beginning of time. The Oneida Nation of Wisconsin has been shaping resilience in the context of struggle, to work toward sovereign community food systems. This particular Oneida community has been geographically divided from all other Haudenosaunee nations, and even from its members own Oneida kin, for nearly 200 years; however, this community was able to re-establish its relationship with corn after years of disconnect. Oneida Nation community-driven projects in Wisconsin have reshaped and enhanced the connection to corn, which places them at the forefront of the Indigenous food sovereignty movement.

Keywords

White Corn, Haudenosaunee, Oneida, Community Resilience, Food Sovereignty

Introduction and Background

Often the words *Corn* and *Resilience* are formulated in the same sentences when considering their connective histories. This is a common misconception. While Corn, or at least the varying strains of Corn indigenous to the Americas, is biologically resilient, without understanding the relational context

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between Corn and Indigenous people the reality is that resilience is an incomplete story. Corn, or what the Oneida (an Indigenous tribe in North America and member of the Iroquois or Haudenosaunee Confederacy) call Oˑnʌ́steˀ, is resilient. However, resilience in the context of Oneida lifeways is a byproduct of a relationship born from reciprocity. Without working to fully understand the relationship between Corn, more specifically White Corn, and Oneida people, *resilience* is just a term used to shape dialogues about abstract ideologies in geographies apart from Haudenosaunee communities. The Oneida have been thinking about and committed to their familial relationship with White Corn since the beginning of time. It is a relationship built on the core Haudenosaunee epistemologies of thanksgiving: a continuous reminder that Haudenosaunee are a part of, not apart, from all that sustains life. And while the reciprocal relationship between White Corn and the people is merely one example of these very old and productive cultural and intellectual relationships that the Haudenosaunee people cultivate with the ecosphere, this relationship represents core values that are built into community resilience, for the benefit of future generations. Because of the spiritual relationship of reciprocity with White Corn, both Oneida and White Corn are resilient, and a byproduct of that relationship—within the uncertain confines of modernity—is healthy food systems, or what scholars call food sovereignty. The Oneida remain committed to revitalizing important intellectual traditions that would help them repair their shared identities as Haudenosaunee.

Through the framework of the Oneida, or more accurately Onʌyoteˀaˑkáˑ (People of the Standing Stone), intellectual traditions of thanksgiving, this paper works toward shaping resilience in the context of struggle, to work toward sovereign community food systems. This article will tell the story of resilience in an Oneida context, how the Oneida Nation[1] of Wisconsin revitalized cultural and intellectual practices grounded in the relationship between oˑnʌ́steˀ[2] and Onʌyoteˀaˑkáˑ. To appreciate the significance of cultural revitalization, we start this article first by highlighting key events in Oneida Nation of Wisconsin history that shaped current reality. Despite being geographically divided from all other Haudenosaunee nations, and even from their own Onʌyoteˀaˑkáˑ kin in the Northeastern United States, this community was able to re-establish its relationship with oˑnʌ́steˀ after years of disconnect. We then go back to the beginning of Haudenosaunee creation with the Haudenosaunee creation story, when the spiritual relationship with oˑnʌ́steˀ was established, and describe how it has evolved. Next, we focus on how communal resilience was rediscovered and has continued to drive all Haudenosaunee, particularly the Onʌyoteˀaˑkáˑ community in Wisconsin, through dedication to the preservation of oˑnʌ́steˀ. We finish by discussing how Onʌyoteˀaˑkáˑ community-driven projects in Wisconsin have reshaped and enhanced the connection to oˑnʌ́steˀ,[3] placing them at the forefront of the Indigenous food sovereignty movement.

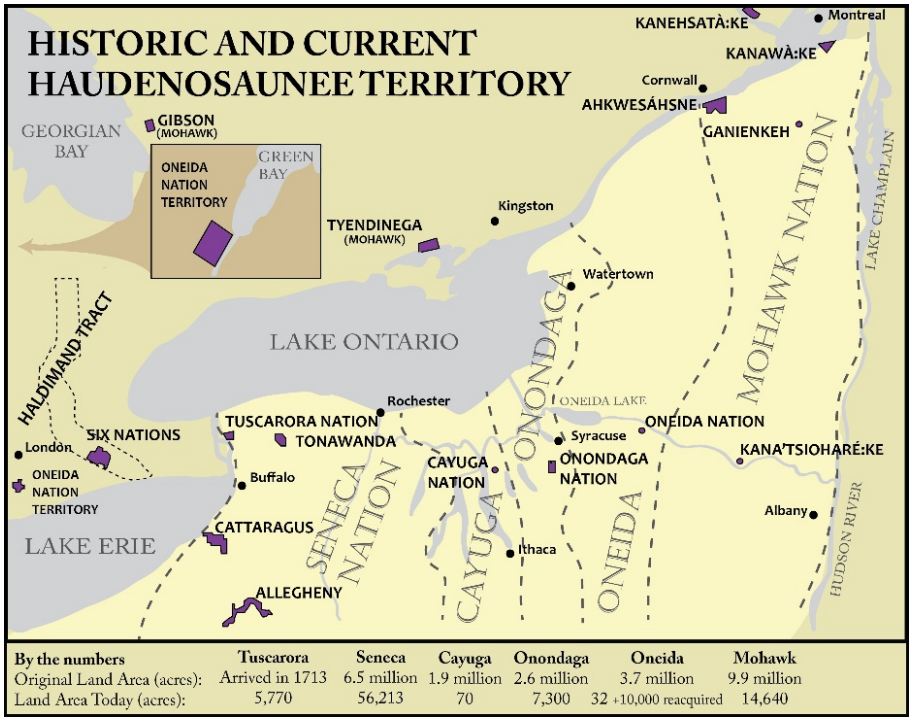
To better understand how resilience is inherent for Onʌyoteˀaˑkáˑ, we begin with their tribal history, one which separated them from other Haudenosaunee nations and strained their relationship with their cultural identities (Figure 1). The Onʌyoteˀaˑkáˑ of Wisconsin were displaced nearly 200 years ago from their brother nations. The Haudenosaunee (People of the Longhouse) Grand Council originally consisted of five nations, with Onondaga, Mohawk, and Seneca making up the Elder Brothers and the Oneida and Cayuga referred to as the Younger Brothers. In 1722 the Tuscarora would join after fleeing from warfare in the southeastern U.S., creating the six nations. Before contact from Western cultures, the Haudenosaunee lived in what is now the state of New York, in the United States. Not unlike many Indigenous nations globally, the Onʌyoteˀaˑkáˑ

[1] The term Onʌyoteˀaˑkáˑ will be used when referring to the people or community, while "Oneida Nation" will be used to refer to the tribal aspect or entity located in Wisconsin.

[2] The term oˑnʌ́steˀ will be used to refer to corn or White Corn in her spiritual sense, while "corn" will still be used to refer to products and/or plant descriptions.

[3] Through observation and lived experiences by one of the authors (who is an enrolled Oneida member).

Figure 1. Historic and Current Haudenosaunee Territory



Source: Two Row Wampum Renewal Campaign, n.d.

were targeted and subjected to colonial pressures. Devastating colonial impacts, include, but were not limited to, were coerced conversion to Christianity; loss of lands from theft, forced sale, and the construction of the American jurisprudence system; countless deaths due to diseases and warfare; loss of identity; and the physical separation from Haudenosaunee brother-nations (Hauptman & McLester, 2002; Lewis & Hill, 2005).

Beginning in the late 1700s, the Onʌyoteʔa·ká· were heavily influenced by Christianity. Countless missionaries and other pressures to convert to Christianity were constant, and after the newly formed United States established itself, the pressure to convert increased tenfold. With all of these colonial pressures, the people eventually found themselves at a crossroads: either stay in New York and face further marginalization and hardship, or embrace Christian values and relocate. A portion of Oneidas chose the latter. Led by missionary Eleazer Williams and under the guidance of Oneida Chief Elijah Skenandore, a group of Oneidas chose to relocate to a new settlement in the state of Wisconsin. The first group of 448 people left New York in 1822, with small groups following through 1840 (Hauptman & McLester, 2002; Lewis & Hill, 2005).

Onʌyoteʔa·ká· found themselves in a climate and on land in Wisconsin similar to their homelands in New York: heavily wooded areas, fertile soil, large meadows, rivers, as well as contiguous tributaries and lakes (Cornelius & Metoxen, 2010). Locals were impressed with how the Onʌyoteʔa·ká· managed these Wisconsin lands, referring to them as "ambitious people" (Hauptman & McLester, 1999, p. 122). Although the Onʌyoteʔa·ká· were highly productive farmers, the vices of modernity often forced Indigenous communities into uncertain futures. The timber industry, other employment opportunities, and U.S. wars would take the men and families away from the community. Federal policies, such as the Dawes Act of 1887, which took communal land away from the tribe and redistributed it in sections of 160 acres to heads of households (Hauptman & McLester, 2006), were created as "a mighty pulverizing engine to break up the tribal mass" (Roosevelt, 1901, para. 134). The tribe, and now individual landowners, were losing surplus lands left after allotment, lands in default from bank loans due primarily to the demand to adapt almost overnight to a new ownership regime that included paying taxes, new jurisdictional issues, and so forth. This era of Onʌyoteʔa·ká· history in Wisconsin resulted in a loss of 95% of tribal land ownership (McLester & Hauptman, 2010; Webster, 2016).

The Onʌyoteʔa·ká· were again a fractured and nearly landless people. As Holm, Pearson, and Chavis (2003) found in exploring the contributing factors to how Indigenous tribes endure colonial pressures and still maintain their identity, the key

contributing factor to the Onʌyoteʔa·ká· survival as Onʌyoteʔa·ká· was their connection to their peoplehood (language, history, land, and ceremony), as is true for many Indigenous peoples. An inherent commitment to remain resilient, is built into their language, history, land, and ceremony, with each cultural indicator reliant on the other for continuity (Holm et al., 2003). During the 1960s and '70s, the entire nation was experiencing a spiritual, social, political, legal, and civil awakening, and Indigenous Peoples were no exception. The American Indian Movement (AIM), a militant group founded in 1968 by American Indians of various tribes living in heavily populated inner cities, followed a mission to promote tribal sovereignty and Indigenous peoples' rights by protesting legal, political, and social issues of tribal peoples from a variety of geographies, spanning from reservation to inner-city communities (Doxtator & Zakhar, 2011). During the civil rights era, there was a intentional push by tribal peoples to reclaim and strengthen their traditional culture and identity.

For Haudenosaunee, the revitalization of language, agricultural crops, and foods became a central focus of the civil rights movement, even to those who had been displaced (Mt. Pleasant, 2011). In conversations with Ernie Stevens Jr., Oneida Nation of Wisconsin tribal member and chairman of the National Indian Gaming Association, he recalls a story from 1971, when at the young age of 12 he experienced his own cultural awakening (E. Stevens Jr., personal communication, 2018). AIM affiliates had helped to bring the White Roots of Peace, a group consisting of Haudenosaunee elders, to the Onʌyoteʔa·ká· people of Wisconsin with a mission to remind Indigenous groups of the importance of traditional language, ceremony, and knowledge systems (*Indian Country Today,* 2003; McLester & Hauptman, 2010). For the first time in his life, he heard Haudenosaunee songs, saw their dances, and listened to the language in a way he had never experienced. For Stevens, this one experience would result in an awakening that would drive a life-long commitment to his community, but for the collective community in Wisconsin this was a reconnection to their identity and the relationships that have always forged their survival as Onʌyoteʔa·ká·.

The collective nations of the Haudenosaunee are governed by their shared ancestral knowledge of creation, which was solidified through the Great Law of Peace, delivered to them by the Peace Maker and Hiawatha. Haudenosaunee ancestral knowledge not only tells of how they came into existence as a people, but how these cultural and intellectual relationships came to be and how they evolved. These stories are intellectual traditions of the tribe, which continue to guide the people in ceremony, history, language revitalization, agricultural preservation, and everyday life. At the core of these intellectual traditions of the tribe is kanehelatúksla?, or thanksgiving—not to be confused with the American holiday, which inaccurately celebrates the initial interactions between the first colonies in North America and Indigenous Peoples. This kanehelatúksla? is a tribal consciousness recognizing all living things in the world that are a part of life: not just human life, but all life. Stories of o·nʌ́ste? are stories of Haudenosaunee creation, they are inextricably linked, one does not survive without the other, it is familial in a way that is well beyond the common practice of plowing, planting, harvesting, and preserving, toward the very existence of a people, since the very beginning of creation.

The birth of o·nʌ́ste? is the birth of the Haudenosaunee. In the Haudenosaunee creation story, o·nʌ́ste? is said to have grown from the body of the first woman born on Turtle Island (North America). The first woman gave birth to twins, the right-handed twin and the left-handed twin, and in the process of giving birth she was killed when the left-handed twin pushed his way through her side in competition to be the first born. The right-handed twin would go on to create mankind; we now refer to him as Shukwaya?tísu. When the mother was buried in the earth, from her body grew tobacco, strawberries, wild potatoes, as well as o·nʌ́ste?, beans, and squash, or what is commonly referred to as Three Sisters*,* Áshʌ na?tekutʌhnu·téhle?. Other versions of this creation story tell of the o·nʌ́ste? growing from the mother's head or from her breast. These plants were interpreted as gifts of sustenance and medicine, as her body was returned to the land and she became known as Yukhinulhá Ohwʌtsya?, Mother

Earth (Cornplanter, 1938; Elm & Antone, 2000).

Haudenosaunee follow a series of cultural practices conducted throughout the year to align with the seasonal cycles of winter, spring, summer, and fall. The cultural practices are associated with preparation, planting, maintenance, harvesting, and preserving food crops. A significant part of the cyclical process is the annual renewal of relationships between Haudenosaunee and the Áshʌ na?tekutʌhnu·téhle? through ceremony. These include (1) Midwinter ceremony (normally in January, five days after our new moon); (2) Seed ceremony (normally held in May); (3) Green Bean ceremony (normally in July, when the beans are ripe); (4) Green Corn ceremony (usually in late August or early September when the o·nʌ́ste? is at its milky stage); and (5) Harvest ceremony (normally in October when the o·nʌ́ste? is gathered after it has matured). Other cultural practices are held to honor the life and life force of plant spirits. At the core of these cultural practices are a tribal consciousness of gratitude for the plants' ongoing commitment to provide sustenance and a giving of thanks for the bountiful harvest. While there are countless cultural practices that shape Haudenosaunee relationships to the universe, the sisters remain a foundational component of many of these practices. Not only are the stories of Áshʌ na?tekutʌhnu·téhle? told before many of these cultural practices can begin, e.g., in the Kanehelatúksla? (Thanksgiving Address), but there is a fundamental story told of how the practices themselves came to be.

Before time as human beings currently know it came to be, the Áshʌ na?tekutʌhnu·téhle? lived in a field. The youngest, dressed in green, was so small she could not yet walk, so she crawled along the ground. The middle sister wore a bright yellow dress and darted back and forth across the field. The eldest sister stood tall and straight and had yellow hair and a green shawl, while her body bent with the wind. One day, the sisters became very interested in a boy that wandered into the field. On a particular day in the summer, the youngest sister suddenly disappeared. In the fall, the boy returned and the middle sister suddenly disappeared. The eldest sister still stood tall, but she mourned her sisters. Struck with grief, the eldest sister began to lose her vibrant colors, and her hair started to wither in the cold, as she would cry for her sisters. The boy heard the eldest sister's cries, so he picked her up and took her to his home, where her younger and middle sisters had followed the boy and decided to stay. The middle and younger sisters explained how they could feel the cold winter coming, so they wanted to stay in the boy's warm and comfortable home, and in return for the hospitality the middle and younger sisters were making themselves useful to the boy and his family. The youngest sister kept the dinner pot full, while the middle sister, still in her yellow dress, dried herself on the shelf so she could fill the dinner pot later in the winter when sustenance was scarce. The eldest sister saw how happy everyone was and decided to stay and dry herself for the people (Eames-Sheavly, 1993).

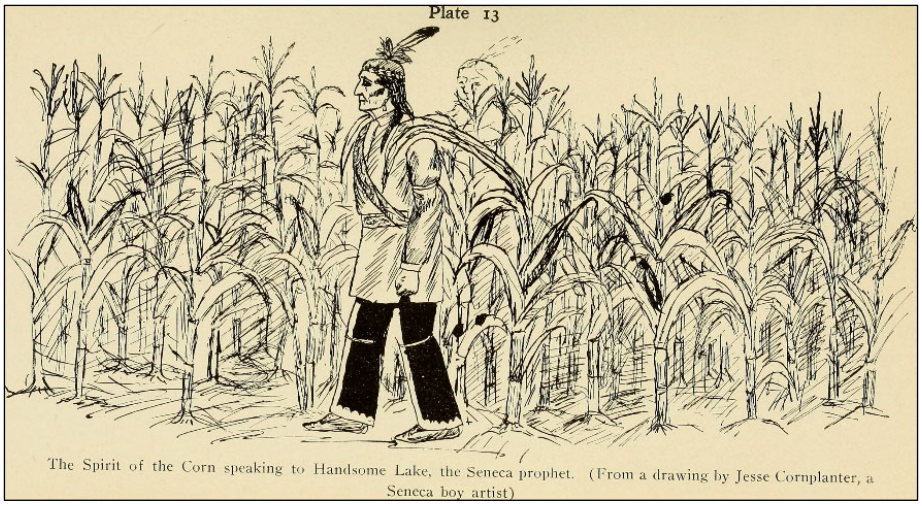
This story shows how Haudenosaunee stories align the sisters with the agricultural cycle and coinciding ceremonies. The youngest sister, beans, leaves the field first because this is the time that she is ripe and can best provide for the people. The middle sister, squash, follows when she has fully ripened and has the ability to provide for the people. The eldest sister, corn, leaves last after she has fully matured and is able to sustain the people throughout the winter months. This story shows how the sisters are a part of ceremonial or cultural responsibilities; in addition, they are active contributors in the homes, being able to provide sustenance for the people throughout the year. An interesting point to be made here is that each sister indicates and teaches the family that they have the ability and knowledge to preserve themselves by drying, to provide a kind of sustenance that is uncommon to find specifically during the winter months. Additionally, it shares nuances of how the sisters need the people just as the people need them, in order to care for them in a way that ensures they can keep returning to the fields every year. While this relationship is highly productive, it is also built on trust. In order to build and maintain trust in any relationship, your responsibility to one another cannot be taken for granted; for the Haudenosaunee, in this relationship they risk losing the sisters forever. The next story demonstrates how the Haudenosaunee nearly lost the Áshʌ

naʔtekutʌhnu·téhleʔ due to colonial influences that occupied and therefore temporarily misplaced their responsibilities.

In the late 1700s, an affliction overcame the Haudenosaunee people. Alcohol was introduced to the Haudenosaunee by European settlers, who pushed the substance on the people because of its trade profitability (Frank, Moore, & Ames, 2000). Without mechanisms to control abuse of this substance, it was not long before this affliction became an epidemic that overtook many Haudenosaunee communities. Alcohol abuse led men to abandon their homes, abandon their duties as fathers, uncles, and nephews, and commit wrongdoings against their own people. Haudenosaunee stories indicate that this era in their history upset the Creator. One man in particular offended the Creator by singing and dancing to ceremonial songs while under the influence of alcohol; this Seneca man was known as Skanyatali·yó (Handsome Lake), and he lived in the community known as Ganondagon in present-day Victor, New York (Figure 2). As punishment, Skanyatali·yó was stricken with illness; he became so sick that all he could do was lie in bed. Unable to consume alcohol, he was able to think, see, and appreciate the beauty of the world again, at which point he started to give thanks to the Creator every day for those things. In 1799, after four years of being bedridden, the Creator decided that Skanyatali·yó would be the one to deliver a message to the Haudenosaunee people, a message meant to remind them not only of their place in the world but their responsibility to Yukhinulhá Ohwʌtsyaʔ (Mother Earth). This message is known to Haudenosaunee as the Code of Handsome Lake or Kaliwiyo, the "good words" (Cornelius, 1999).

Shukwayaʔtísu sent three messengers to help Skanyatali·yó deliver this message to the Seneca people, and the message soon spread to the rest of the Haudenosaunee communities. The Creator's messengers informed Skanyatali·yó that once he had delivered his message, a fourth messenger would appear to him and it would be his time to return to Sky World. The Áshʌ naʔtekutʌhnu·téhleʔ heard of this and went to Skanyatali·yó to asked him for a favor; they wanted to go with him when he returned to Sky World, because the people had forgotten their responsibilities to them and had begun mistreating them as well as taking them for granted. Skanyatali·yó knew that if he took the Áshʌ naʔtekutʌhnu·téhleʔ with him, the Haudenosaunee would not survive. Skanyatali·yó convinced the sisters to stay until he could talk to the Haudenosaunee and explain the consequences if they continued to mistreat the Áshʌ naʔtekutʌhnu·téhleʔ. Once Skanyatali·yó explained, the Haudenosaunee quickly realized their error and began to once again care for the sisters and honor them through ceremony. This story acknowledges that the sisters are spiritual beings that rely on our support just as the people rely on them for sustenance. Haudenosaunee communities cannot expect the sisters to continue to provide them with a bountiful harvest if they are not caring for them properly, physically, spiritually, and in ceremony throughout the entire year (Cornelius, 1999).

Figure 2. Skanyatali·yó Approached by the Corn Spirit



Source: Finan, 2017.

Methods

The case study presented here includes archival analysis of documents and published materials related to the history, displacement, farming, and first-hand accounts of Oneida life. The findings presented are a part of an ongoing study about the relational contexts the Oneida maintain to a community-based consciousness of their history, language, land, and cultural practices. The researchers collaborated with Oneida culture bearers to better understand the deep relational dimensions of their experiences (Kovach, 2006; Wilson, 2008). The researchers also relied heavily on anecdotal observations and experiences, both as interested parties but more importantly because one of the authors is a life-long community member and Oneida Nation citizen. The study was guided by Indigenous research methods, specifically the adherence to diverse ontologies of Indigenous knowledge production, transmission, and acquisition (Kovach, 2006; Wilson, 2008).

Employing one of the author's anecdotal experiences and observations over a lifetime of living in and being an active community member, the authors were able to identify key themes of interest that assisted in the organization of all materials. Over the course of a year and a half we collected and organized literary materials from archives, journals, books, newspapers, biographies, and autobiographies. We organized our findings by categorizing them by the Oneida (1) removal from New York to Wisconsin; (2) agricultural activities; (3) cultural and spiritual practices that reflected a relationship to food; and (4) community-based and non-community-based Haudenosaunee scholars who write about culture and food. To accompany the literature, we identified and coded data collected from a larger study that fit key organizing themes created at the onset of the study. When questions arose about the material or data collected in the larger study, we were able to contact culture bearers and linguists to think through complex intellectual Oneida traditions, such as Oneida words and stories. Informed by one of the author's experiences and observations as an active community member, we were able to identify key themes of interest and proceed with a focused research agenda.

Case Study: O·nʌ́stəʔ Resurgence

When referring directly to food, John Mohawk, a Haudenosaunee leader, says that Haudenosaunee knowledge weighs the value of food in "life force," not in dollars, but that understanding has shifted in mainstream society, turning foods like o·nʌ́stəʔ into a corporate species driven by money (Nelson, 2008). Revitalizing this life force, the Oneida Nation is combating the corporate model through the creation and operation of the Oneida Community Integrated Food Systems (OCIFS). OCIFS is founded on a mission to help families with dietary and food needs by housing a community initiative, which incorporates traditional foods to help create as well as reestablish a local economy that provides jobs and promotes and encourages long-term solutions to farm and nutrition issues on the Oneida Reservation (Oneida Nation of Wisconsin, n.d.). This multifaceted component of the tribe consists of the following entities: Tsyunhehkw^ (an 80-acre organic farm), the Oneida Farm (bison and grass-fed beef herds), the Oneida Apple Orchard, Farmer's Market, 4-H Club, Oneida Cannery, and the Food Distribution Center (Stevens, 2014). OCIFS has helped bring a healthy community together by providing traditionally significant, organic, and sustainably farmed food products. In addition, they have helped educate the community about the numerous health benefits of a traditional Haudenosaunee diet that will protect an Indigenous community from chronic diseases, such as diabetes and heart disease (Webster, 2018).

While every aspect of OCIFS is impactful and beneficial, at the core of this tribal initiative is the tribe's reclamation and continuation of familial relationships to o·nʌ́stəʔ. Dating back to Onʌyoteʔa·ká· origins, this reciprocal relationship is one that cannot be so easily forgotten. Regardless of the struggles, the commitment to this relationship remains deeply embedded within the community's Haudenosaunee genetics. This relationship was revitalized on the Wisconsin reservation after years of communication-building between the Onʌyoteʔa·ká· in Wisconsin and other Haudenosaunee communities in Canada and New York. Oneida Nation's organic farm, Tsyunhehkw^, harnessed the intrinsic power

within the o·nʌ́ste? after a visit to traditional Haudenosaunee homelands in the state of New York in 1991, which was prompted by many tribal members' awakening during the civil rights era. Efforts made by Vicki Cornelius and Artley Skenandore to secure funding through the First Nations Development Institute reunited the Wisconsin Oneida community in 1991 with Indigenous seeds preserved by a Tuscarora farm in New York (V. Cornelius, personal communication, October 24, 2012). The base of Tsyunhehkw^ is *unhe,* symbolizing a genealogy that connects Onʌyote?a·ká· back to all life: it means "alive," so the word translates to "it provides us life," or simply, "life sustenance." Today, the farm lives up to its name by providing the community with life through the preparation, planting, growing, and harvesting of o·nʌ́ste?. Tsyunhehkw^ has brought life to the community by taking on the difficult task of caring for their reciprocal relationship with o·nʌ́ste?. While caring for o·nʌ́ste? comes with an important ceremonial responsibility, it is also a very labor-intensive process from start to finish.

Traditionally, the seeds are soaked in preparation for sowing them, utilizing a mounded earth system, generally three to five feet apart. Haudenosaunee communities practiced Áshʌ na?tekutʌhnu·téhle? mound planting by putting o·nʌ́ste? seeds in every mound, squash seeds in alternating hills, and beans between mounds (Mt. Pleasant, 2016; Parker, 1910). In this system, the beans take nitrogen from the air and deposit it into the soil for the other plants to use; the o·nʌ́ste? uses the nitrogen to grow a tall stalk that provides needed support for the bean's vines to climb. And the squash, otherwise known as the wild sister, shades the ground with her large and unruly leaves, protecting the soil and repelling herbivores. These intellectual traditions are knowledge systems providing a number of things that contribute to successful and sustainable outcomes, such as enhancing the soil's physical and biochemical environment, minimizing soil erosion, improving soil tilth, managing plant population and spacing, providing nutrients in appropriate quantities, and, at the time needed, controlling weeds (Mt. Pleasant, 2006). The Áshʌ na?tekutʌhnu·téhle? support each other in a way that is beneficial for the land as a whole, while at the same time allowing for the best harvest available to the people.

The harvest itself normally consists of two separate harvests. The initial Green Corn harvest, generally a short time during which the o·nʌ́ste? is picked while still soft, referred to as "sweet corn" (Mt. Pleasant, 2016; Parker, 1910). The larger and more intensive harvest comes in autumn after the o·nʌ́ste? has significantly hardened; this is known as the husking bee (Cornelius, 1999). At the husking bee, the community comes together to harvest, husk, and braid the cobs together into tall, beautiful collections that are a physical representation of years of resilience, imbued in the braids and community working together to create the braids (Figure 3). Historically, the braids were then hung from rafters in longhouses to dry. This method is still heavily utilized today by hanging the braids in more modern-style barns. Onʌyote?a·ká· maintain their traditional harvesting practices by continuing these relational commitments, specifically by inviting the community out every year for their

Figure 3. O·nʌ́ste? Braid

Photo courtesy of Rebecca Webster.

annual husking bee festival. This harvest provides a friendly, communal setting that encourages the transfer of knowledge, community healing, laughter, and enjoyment of the people, while they contribute to the overall well-being of the community. Also taking place during these husking bees are several information sessions, such as Corn Husk doll making, historical growing and cooking practices, as well as a Corn Soup competition. Tsyunhehkw^'s husking bee is open to anyone willing to lend a hand and learn about o·nʌ́ste?. They also host various area school trips so that students, both Indigenous and non-Indigenous, have the opportunity to learn about sustainable agriculture through relationships of reciprocity.

Once the o·nʌ́ste? has been dried and properly shelled, it is turned over to the cannery staff to be processed and packaged into several o·nʌ́ste? products, such as dehydrated white corn, corn mush, and corn bread flour, as well as premade corn mush and corn bread. Along with the creation of the tribe's own natural health store, the Oneida Market, they have been able to grow, harvest, process, and distribute o·nʌ́ste? products to their people, all within the boundaries of the Onʌyote?a·ká· reservation in Wisconsin. Demand for the o·nʌ́ste? has steadily increased over the years, requiring the market to supplement its o·nʌ́ste? stock with products from a Seneca operation out of New York, the Iroquois White Corn Project. Helping aid this issue is a group of Onʌyote?a·ká· families that were brought together by a mother and daughter duo, Laura Manthe and Lea Ziese, who saw a chance to contribute to their community. In the process, they formed a network of knowledge between members of the community that would allow for successful growth of the o·nʌ́ste?, while also assisting with the rising demand for the product on the reservation (Webster, 2018).

Figure 4. Orion (at left) and Lucia Stevens Shelling O·nʌ́ste? in their Home

Photo courtesy of Stephanie Stevens.

In conversations with the daughter, Zeise, she talked about her mother, Manthe (Oneida Nation of Wisconsin tribal member), feeling distraught after a visit in New York. She learned that Haudenosaunee community members were purchasing o·nʌ́ste? from a non-Indigenous farmer; this brought about many mixed emotions for Manthe (L. Zeise, personal communication, 2018). Soon after, Manthe began exploring ideas for growing her own o·nʌ́ste?, and with her daughter's help they have made significant efforts toward providing a place for their Onʌyote?a·ká· community in Wisconsin to expand their traditional agricultural knowledge through the care of their reciprocal relationship with o·nʌ́ste?. They have done this by bringing together eight families, securing funding through grants, utilizing very old but still intact knowledge systems in Tsyunhehkw^ staff members, and purchasing seeds from the Onondaga Nation in New York (Webster, 2018). This group of families call themselves Ohe·láku, which means "among the cornstalks." The group has focused on sharing knowledge and incorporating language and culture into their gardening practices by inviting more families to engage with the group, holding their own husking bee, and hosting other Haudenosaunee and Indigenous groups. The transference of this knowledge to the next generation is seen in two youth members, Orion and Lucia Stevens, shelling their o·nʌ́ste? in the comfort of their home on the reservation (Figure 4).

Figure 5. Ohe·láku Seed Braid

Photo courtesy of Rebecca Webster.

Ohe·láku is a shining example of what Onʌyoteˀa·ká· women are capable of when they approach something with a good mind, find strength in their relationship with o·nʌ́steˀ, and dedicate themselves to their community. When referring to one version of the origin of *Áshʌ naˀtekutʌhnu·téhleˀ*, where o·nʌ́steˀ is said to have grown from the breasts of Yukhinulhá Ohwʌtsyaˀ, Katsi Cook says, "At the breast of women, the generations are nourished. From the bodies of women flows the relationship of those generations both to society and to the natural world" (Cook, 1997). When asked why she decided to grow o·nʌ́steˀ, active Ohe·láku community member Rebecca Webster talked about her personal responsibility to provide for her community, due to multiple years of corn shortages experienced by the tribe (R, Webster, personal communication, 2018). Additionally, she spoke of the reciprocal relationship between o·nʌ́steˀ and the Onʌyoteˀa·ká·, by saying she understood that the o·nʌ́steˀ needed her just as much as she needed it. One of Webster's beautiful seed braids can be seen in Figure 5.

Discussion

While the world is subject to unstable and often unthoughtful industrial food systems with the intention of making food more accessible and convenient for humans, many people have lost access to their inherent right to safe, healthy food. As a global society, we have found ourselves here through a process that takes resilience away from humankind and has "impoverished millions of peasants and Indigenous peoples by displacing them from the land, resulting in many of them being forced into wage labor to serve the global food economy" (Coté, 2016, p. 7). For Indigenous peoples, however, it is not simply about food security; it is about the right to grow the foods that signify their ancestral knowledge of relationships to those foods, using the methods they deem important to cultural livelihood. Robin Kimmerer (2013) Indigenous scholar, says that we are bound to these reciprocal relationships with human and nonhuman entities through a "culture of gratitude," or Kanehelatúksla? (p. 146). Indigenous Knowledge systems take food sovereignty beyond the right to our food and include the protection of those

ancestral relationships built into intellectual traditions that inextricably link all living things to humans.

For the Onʌyoteˀa·ká· in Wisconsin, food sovereignty was never about using food systems to exercise power; rather, like a number of Indigenous peoples, they have an engrained history of respecting the power within our food, which reflects an understanding that the universe is alive and therefore should be treated respectfully (Little Bear, 2000). And while the interconnected aspects of culture, heritage, politics, and place can make it difficult to define Indigenous food sovereignty for all Indigenous communities, the inherent power within o·nʌ́steˀ represents something that goes beyond the concept of food sovereignty. It is a tribal consciousness that is acted upon, and while action indicates hard work, Deborah Bird Rose, an Aboriginal ecological ethnographer, speaks to this notion of work, saying "none of this work could be thought to rewrite the Anthropocene so as to give it a happy ending. . . . But it removes us from that singular position of spectator; it acknowledges the truly tangled up quality of our lives, and suggests some modes of action in a time of on-going trouble" (Rose, 2013, p. 10). For Onʌyoteˀa·ká· in Wisconsin, work, or the action of hard work, is relational; it is not only expected, it is of paramount importance.

Carol Cornelius (1999) found that "corn emerged as a vital element of the Haudenosaunee culture on spiritual, philosophical, political, sociological, and economic levels" (p. 67). More directly, she calls o·nʌ́steˀ the "cultural center of Haudenosaunee way of life" (p. 91). O·nʌ́steˀ is at our cultural center because it encompasses so much of what it means to be Oneida or Haudenosaunee; however, it does not simply represent a reciprocal relationship. O·nʌ́steˀ has a living spirit. Through the stories above, we see that o·nʌ́steˀ has the ability to think and feel emotion. In addition, o·nʌ́steˀ is like the people: while each outer husk shares a resemblance with every other, each thread of the corn silk attaches to a single kernel, forming a unique entity. One member of the Ohe·láku group compared growing o·nʌ́steˀ to pregnancy, adding, "I knew things were coming, but I didn't know what" (Manthe, n.d., "Results to Date," para. 4). Growing o·nʌ́steˀ is an intimate process, much like growing a child. We plant a seed, giving birth to a life, nurturing a living being the best we can, and giving it all the things it needs to grow, yet we do not know with certainty what the final result will be. Just like a child, each cob will have its own physical traits, its own personality, and its own way of communicating. Our job, not as parents in a paternalistic way but as partner, is to hold ourselves accountable to our end of the relationship, as our ancestors committed us to at the beginning of time.

Just as o·nʌ́steˀ has her own emotions, the people are able to transfer their emotions to her. This is why Manthe talked about the importance of starting out her group with good feelings, allowing for an atmosphere of laughter, good-natured teasing, and good food (Wisneski, 2016). In addition to ceremony, O·nʌ́steˀ needs to feel the good energy from the people in order to feel safe in returning every year. The Onʌyoteˀa·ká· call this kaˀnikuhli·yó, openness of a good spirit or mind, often referred to as having a "good mind." Oneida Nation cannery worker Jamie Betters echoes this idea by acknowledging the importance of kaˀnikuhli·yó when working with the o·nʌ́steˀ, because the cannery workers are the last ones to touch it before it goes out to the people (Herzog, 2009). Not only is this true in this relationship between Haudenosaunee and o·nʌ́steˀ, but western scientists are finding that many wild plants and vegetative species are healthier when they interact with humans (referred to as ethnophytopathology). Consequently, the transfer of emotion is given back to the community after the o·nʌ́steˀ has been processed and packaged for use in every Onʌyoteˀa·ká· home. Their reciprocal relationship goes beyond sustenance and ceremony; it is a deeply emotional bond that lives its life out in the o·nʌ́steˀ itself.

The Haudenosaunee live by the seven generations philosophy, which tells us that we must live in a way that ensures the welfare of the next seven generations, just as the seven generations before us did (Lyons, 2003). In our ancestral stories, the Áshʌ naˀtekutʌhnu·téhleˀ are sometimes referred to as "our sustainers" (Cornelius, 1999, p. 71), so the Haudenosaunee understand that in order to ensure those futures we must continue to value our

relationship with our sustainers in every aspect of life on a daily basis. Oren Lyons (2003), an Onondaga Faith Keeper and renowned scholar, refers to the ideology that all spirits of nature are relatives to the Haudenosaunee people, and he continues by calling out to our generation to not fear these relationships, but to find strength in them as we look toward the future. This is exactly what the Onʌyoteˀa·ká· in Wisconsin have been doing for the past several decades. Not only have they found strength in their relationship with o·nʌ́steˀ, they have nurtured it through years of communal resiliency. All these things are interconnected and represented through their reciprocal relationship with o·nʌ́steˀ.

Conclusion

> *Others have taken the challenging path of believing that we can respect the values of our ancestors while being good American citizens, in a thoughtful, determined, proactive way. That is both our responsibility and our children's, and to achieve it we rely on the Indian commitment to family and community. This commitment has never been lost; nor is it dependent on the outside for its vitality. It is the ultimate link we have to our ancestors.*
>
> —*Ernest Stevens Sr., longtime Onʌyoteˀa·ká· advocate for Indigenous sovereignty and self-determination, and former first vice-president of the National Congress of American Indians (Stevens, 2010, p. 251)*

Indigenous food sovereignty has given Indigenous communities a platform to honor the importance of intellectual relationships with nonhuman entities. Resilience on the Oneida Nation reservation in Wisconsin is inherently built into their commitment to all life, and a prime example of this is how the people have maintained those relationships through the commitment to community by harnessing the power within intellectual traditions imbued in very old relationships with o·nʌ́steˀ. While this article relied on the term "resilience" to help frame our central argument, the reality is that at no time did we as authors feel the need to define the term resilience to contextualize the Onʌyoteˀa·ká· or Haudenosaunee experience. Those intellectual exercises take away from what resilience is for the Haudenosaunee: beautiful. Further, while the idea of decolonization has assisted in bringing cultural and linguistic practices back to Indigenous communities, there is unimaginable value there if left undefined; establishing parameters can also limit the possibilities for future generations. Valid to this point is what Ernie Stevens Sr. believed, that it is possible to be active members in modern society while continuing to practice, respect, and honor our ancestors through tradition. Our ancestors trusted us to hold ourselves accountable to their commitments in order to build healthy communities that are inclusive of all life. The foundational underpinnings of these relationships are valuable knowledge, and with that knowledge we must make thoughtful decisions that will defend and protect the next seven generations to come. The evolution and innovation of traditional agricultural practices by the Onʌyoteˀa·ká· in Wisconsin exemplifies how o·nʌ́steˀ initiatives have become "*thoughtful, determined and proactive"* (Stevens, 2010, p. 251; emphasis added) in modern society, while still maintaining a respect for that knowledge.

The Onʌyoteˀa·ká· revitalized their reciprocal relationship with o·nʌ́steˀ away from their homelands in a relatively short amount of time, regardless of their difficult history. Tsyunhehkw^ continues to see a steady rise in demand for the products each year, and the Ohe·láku group has been growing to include more families since its beginnings in 2015. The people are engaging with o·nʌ́steˀ more and more by telling their stories, speaking their language, singing their songs, and dancing with the living universe. O·nʌ́steˀ for the Onʌyoteˀa·ká· is not just a food item, it is not just a tall stalk for our beans, and it is not just a story. It is a connection felt by the people, it is a deep spiritual emotion, and it is a resiliency celebrated at every ceremony or community gathering. All with the smell of o·nʌ́steˀ in the air.

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Eating in place: Mapping alternative food procurement in Canadian Indigenous communities

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Abstract

This paper reports on alternative food procurement initiatives in Canadian Indigenous communities. Like many communities around the world, they have experienced the 'nutrition transition' toward nutritionally compromised industrial food, with debilitating results. Much of this change in nutritional status has been created by a lethal combination of self-serving government policy and predatory corporate practice that ghettoizes Indigenous communities within a for-profit pseudo-food system. To find solutions to the colonially structured food deserts imposed on them, many Indigenous communities have turned to the social economy, initiating projects such as community gardens, greenhouses, and co-operatives. While largely unrecognized in the wider world, these initiatives are created and managed by communities, for the benefit of communities, giving us a deeper understanding of what place-based food systems can accomplish.

Keywords

Colonially Structured Food Deserts, Food Procurement, Indigenous Communities, Nutrition Transition, Place-Based Food Systems, Social Economy

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Introduction

Place-based food systems involve an interdependent web of activities that include the production, processing, distribution, consumption, and disposal of food in a particular place (Sumner, 2017). Around the world, these systems carry the potential not only to address the needs of communities, but also to support their development. In Canada, Indigenous communities developed place-based food systems, anchored in traditional foods harvested locally (also known as country food). These traditional food systems include all the food within a particular culture that is available from local natural resources and is culturally accepted, while at the same time encompassing socio-cultural meanings, acquisition and processing techniques, use, composition, and nutritional consequences for the peoples using these foods (Kuhnlein & Receveur, 1996). However, the ongoing forces of colonization have degraded or destroyed these traditional systems and compromised Indigenous people's access to the land and resources that underwrite their ability to continue eating in place. The result is what is known as food deserts—areas where nutritious and affordable food is not readily available (Koç, Sumner, & Winson, 2017).

Much has rightly been made about the intractable issues facing Indigenous people (Truth and Reconciliation Commission of Canada [TRC], 2015), including the challenges of eating in place. However, media, academic, and popular attention has largely remained on developing a general and often paternalistic awareness of these problems rather than focusing on existing solutions. This is particularly true in terms of food procurement. The astronomical cost of fresh and nutritious food and the negative results of the 'nutrition transition' to lower-cost industrial food in many Indigenous communities have been identified in some quarters, but the collective place-based solutions community residents have devised to overcome these challenges largely have been overlooked.

This paper focuses on alternative food procurement in Canadian Indigenous communities through the lens of a "just transition," which aims to reduce social inequality (Heffron & McCauley, 2018). The paper will begin by discussing just transition and its logical obverse, unjust transition, illustrated by the social economy and the nutrition transition. It will then outline the present research's approach to mapping sites of alternative food procurement and report on research findings. It will conclude by discussing how Indigenous communities are building Indigenous food sovereignty and food security through food procurement initiatives and the role these initiatives play in the just transition from colonially structured food deserts to a place-based food system.

Just Transition

The concept of a just transition proposes that justice and equity must be integral parts of any transition toward a low-carbon world (United Nations Research Institute for Social Development [UNRISD], 2018). Developed in the 1980s by the U.S. trade union movement as a response to new regulations to reduce air and water pollution by shutting down offending industries (Newell & Mulvaney, 2013), a just transition can be broadly understood as "a vision-led, unifying and place-based set of principles, processes and practices that build economic and political power to shift from an extractive economy to a regenerative economy" (Climate Justice Alliance [CJA], n.d., p. 1). While the term 'transition' has gained credence as a result of the increasing recognition of the need to move to a lower-carbon future (e.g., Transition Towns), there is no guarantee that such a transition will be fair and equitable. A just transition addresses this issue by drawing attention to the quality of the transition itself, emphasizing that if the process of transition is not just, the outcome will never be (CJA, n.d.). In this situation, justice involves both social justice—the assignment of rights and responsibilities within society (Sumner, 2005)—and environmental justice—the well-being and rights of past and future generations, equity considerations based in race, class, gender, and nation, and our rights and obligations toward nonhuman forms of nature (Pulido, 2000). As the charter of the Global Greens (2001) states, "there is no social justice without environmental justice, and no environmental justice without social justice" ("Social Justice," para. 2). From an Indigenous perspective, Corntassel (2012) lays the groundwork for such a just transition when he links social and environmental

justice to a resurgence of traditional foods (including community roles and responsibilities to protect traditional lands and food systems) as necessary acts of resurgence and pathways toward reconciliation, all of which will help to restore sustainable relationships with the land, culture, and communities.

In their book *Just Transitions: Explorations of Sustainability in an Unfair World,* Swilling and Annecke (2012) argue that a just transition needs to be based on a mode of production that does not depend on either resource depletion or environmental degradation, and needs to address widening inequalities regarding consumption and access to power. They propose that there is no single transition pathway that is relevant for all contexts, but add that such a transition requires deep structural changes, emphasizing issues such as the importance of food security and the requirement for both alternative diets and agro-ecological farming practices to restore the soil.

While the concept of just transition has generally been applied to energy, it can apply equally well to food and the necessity of the transition to sustainable, less energy-intensive food systems (see, for example, Heffron & McCauley, 2018). In this vein, Gilbert, Schindel, and Robert (2018) use school food as "an entry point for introducing a just transition to the local food system, enhancing food equity built from healthier social, economic, ecological, and political systems" (p. 95). They maintain that a just transition is holistic in scope and encompasses five crucial activities that interact and overlap: democratize engagement, decentralize decision-making, diversify economic activity, decrease consumption, and (re)distribute resources and power. Following Gilbert et al. (2018), we argue that Indigenous food initiatives also can be an entry point for introducing a just transition to the local—place-based—food system, which would increase food security, support the environment, and enhance sustainability.

In light of the recognition that such a transition is inevitable, but justice is not (CJA, n.d.), it is important to acknowledge the obverse of just transition: unjust transition. Some transitions clearly have not been just and have benefited a privileged few. In essence, an unjust transition is informed by "ecological modernization . . . via large-scale, top-down techno-fixes, co-managed by powerful corporate elites with access to new global funding mechanisms" (Swilling & Annecke, 2012, p. 181). One example is what is known as the nutrition transition.

An Unjust Transition: The Nutrition Transition

The nutrition transition refers to a change in a population's nutrition status, which is characterized by increasing rates of obesity, cardiovascular disease, and various cancers (Koç, Sumner, & Winson, 2012). The term was developed by Popkin (2003), who observed dietary changes moving into the developing world and subsequently increased rates of noncommunicable diseases. These dietary changes, often referred to as the 'Western diet,' were associated with exceptional consumption of saturated fats, sugar, salt, and refined foods. After noting the 'Western diseases' that invariably follow the introduction of the Western diet, Pollan (2008) points out that although humans have adapted to many types of diets, the Western diet is not one of them. This is especially true for Indigenous communities, as we will discuss below.

Samson (2016) observes that the nutrition transition is the most important issue affecting the health of Indigenous peoples around the world. Describing it as "a change from gathered, farmed, fished, and hunted foods to industrialized energy-dense diets" (p. 1), he adds that the nutrition transition has been accompanied by shifts in the population from being physically active to being sedentary. In their discussion of what constitutes good food, Martin and Amos (2017) investigate the nutrition transition taking place in Canada's Indigenous communities and the heavy burden of chronic disease associated with the transition, pointing to the impact of colonization on the way the nutrition transition has manifested in these communities and the chronic food insecurity experienced by many Indigenous people. When analyzing the food crisis in Indigenous communities, these authors stress the traditional importance of food in the realization of community among Indigenous cultures, and argue that respecting traditional cultural practices in terms of food must constitute part of the solution to colonization and industriali-

zation needed in many Indigenous communities, and indeed in other communities and cultures around the globe.

For many remote communities in Canadian sub-Arctic regions, the Northern Store (owned and operated by the Hudson Bay Company until 1987) has been the conduit for the nutrition transition because both the cost and quality of the foods it purveys do not support healthy dietary choices (Thompson, Kamal, Alam, & Wiebe, 2012). In more southern communities, supermarkets, convenience stores, and fast-food outlets spark the nutrition transition through their offerings of pseudo foods—"nutrient-poor edible products that are typically high in fat, sugar, and salt and, other than the calories they provide, often in overabundance, are notably low in nutrients such as proteins, minerals, and vitamins essential for health" (Winson, 2017, p. 187)—which are undermining healthy eating behaviors in society.

Nowhere has this undermining of healthy eating behaviors been more apparent than in Indigenous communities, which have been targets of genocidal government policy and predatory exploitation by for-profit corporations. As Martin (2012) argues, rather than being an inevitable by-product of development, the nutrition transition requires a more nuanced approach to assessment that "sheds light on how an individual's food 'choices' are often the product of government policies and marketing strategies that promote processed and refined foods to the exclusion of more traditional or unprocessed foods" (p. 208). Such an approach includes recognizing the creation and enforcement of what we refer to as colonially structured food deserts—structurally imposed spaces that benefit narrow partisan political objectives and corporate profiteering through the purveyance of externally procured, culturally insensitive, pseudo foods to vulnerable communities.

Compounding this unjust transition, food has long been a weapon of government policy aimed at Indigenous people in Canada, from the establishment of the country to the present day. The first prime minister of Canada, John A. MacDonald, withheld the food promised in signed treaties to coerce Indigenous people onto reserves (Daschuk, 2015). And the scanty meals served to Indigenous children forced into the residential school system resulted in high levels malnutrition, sickness, and death throughout the 20th century (TRC, 2015). Currently, the foods imported into northern Indigenous communities by the Northern Store are not culturally attuned, are often low-quality processed foods, and are significantly overpriced despite subsidies from government—creating high profits for corporations and negative economic and health impacts for communities and households. Government plans to address this problem, such as Nutrition North Canada, are seen as ineffective; "a 2014 Auditor-General's report . . . raised doubts on whether subsidies given to retailers were being properly passed on to consumers" (Hui, 2016, para. 13). In addition, Canada's 2007 *Food Guide for First Nations, Inuit and Métis* recommends products such as fresh produce and meats, which are prohibitively expensive in remote communities (Burnett, Skinner, Hay, LeBlanc, Chambers, 2017), while the 2019 *Canada's Food Guide* does not yet directly address Indigenous people. In short, the predominant form of food procurement in Indigenous communities is creating colonially structured food deserts.

The unique problem resultant of these colonially structured food deserts, facilitated by collusion between the government and the private sector, is the ghettoizing of Indigenous communities within and by a for-profit pseudo-food system. And this uniquely oppressive system is perpetuated by a difficult-to-penetrate myth of colonial paternalism—the idea that only the government or the private sector is able to solve the food problems of Indigenous communities. The colonial legacy of the Indian Act is therefore maintained through a policy of food system paternalism and reinforced through corporate complicity, continuing a long tradition of economic marginalization and cultural erasure. This returns us to the issue of what alternative form of food procurement is called for to reverse the unjust nutrition transition and encourage a just transition—one that respects traditional cultural practices, supports fairness and equity, and overcomes colonially structured food deserts. One path to a just transition can be found through the social economy.

A Just Transition: The Social Economy

The origins of the social economy (or the third sector) date to long before the period of industrialization (or the modern state) (Shragge & Fontan, 2000), but its importance is growing at a time when the state has either withdrawn from economic activity or has sided almost completely with private interests. In contrast to the neoliberal capitalist economy, the social economy aims to create an egalitarian, inclusive, and more deeply democratic society that promotes social justice and equality (Molloy et al., 1999, in Amin, Cameron, & Hudson, 2002), making it a potential vehicle for a just transition. In essence, the social economy involves "economic activity neither controlled directly by the state nor by the profit logic of the market; activity that prioritizes the social well-being of communities and marginalized individuals over partisan political directives or individual gain" (McMurtry, 2010, p. 31). Co-operatives, nonprofits, credit unions, and mutual associations are some of the organizations that participate in the social economy, operating both within and against the neoliberal market (Sumner, 2017).

Faced with a wide range of negative consequences of neoliberalism, more and more people are turning to the social economy for solutions to their problems (see McMurtry, 2010; Mook, Quarter, & Ryan, 2010). This is particularly true in the area of food, as evidenced by the proliferation of food co-ops, food hubs, food banks, and food programs. While some of these ventures might be effective, Goodman, Dupuis, and Goodman (2014) suggest that the social economy "is not up to the structural challenge of equalizing access to healthy food" (p. 83). Indeed, after discussing the market orientation of alternative food networks in general, Goodman et al. assert that the Achilles heel of these networks is social justice because "the poor and disadvantaged continue to be ill-served" (p. 84), which calls into question the efficacy of the social economy as a vehicle for a just transition. This reflects the work of Cook, Smith, and Utting (2012) in their United Nations occasional paper on a fair transition, in which they highlight the social economy as one of several just transition paths to a green economy. From Cook et al.,'s perspective, the positive social aspects of the social economy as a vehicle for a just transition include redistribution (in terms of income, wealth, and power), rights, social justice, equality of outcomes, empowerment, and citizen action. The positive environmental aspects involve environmental justice, agroecology, and grassroots action. The positive economic aspects encompass deglobalization, localization, institutional reform, and regional solidarity. However, these authors warn that the path is a contested one if inequalities are not addressed.

One area of the social economy that seems to counter such warnings and open up possibilities for a just transition involves Indigenous organizations, although Wuttunee (2010, p. 210) acknowledges that the Aboriginal community is grappling with the term 'social economy':

> The presumption must be that the social economy label is a term that comes from outside a given community—and as such may or may not fit with the terminology used by that community for naming its experience, even though many aspects of what is labelled by the concept describes centuries-old Aboriginal practice.

For Wuttunee (2010), the social economy has emerged as an effective community development tool for two reasons: it allows for a variety of forms, and it maintains control in the hands of Aboriginal communities. She suggests that co-operatives, in particular, offer Indigenous communities a measure of autonomy over their development and allow for the realization of community values, with any profit being under community control. For these reasons, she points out that Aboriginal people are more likely than the general Canadian population to be members of co-operatives, and that co-ops have been especially well used by Aboriginal people as a way to meet community needs. This study builds on Wuttunee's work by mapping alternative, place-based food procurement in Canadian Indigenous communities. At the heart of these initiatives is the desire and the will to overcome the unjust nutrition transition caused by the colonially structured food deserts that characterize many Indigenous communities

and to forge a just transition via the social economy to a more sustainable, place-based food system.

Methodology

We used a three-stage method to assemble a map and a corresponding Canada-wide database of alternative food procurement in Indigenous communities. The initial step in the research process was to conduct an online search using the keywords "Indigenous/First Nation/Inuit/Metis food project" and "Indigenous/First Nation/Inuit/Metis food program." We used an online search engine to scan related media articles, information from support organizations (i.e., organizations that provide financial and/or logistical support) and reports, and conducted a search using the same keywords via ProQuest and Google Scholar for academic articles. As a result of this initial search, various types of Indigenous food initiatives were identified, including but not limited to such things as co-operatives, community gardens, community food markets, traditional food initiatives in healthcare institutions, and school gardens. Subsequently, a secondary online search (via both an online search engine and academic databases) was conducted for each type of initiative, resulting in the identification of numerous additional initiatives and organizations that implement or support alternative food procurement in and/or by Indigenous communities. The third stage of the online search involved an inquiry into the websites of, and grey literature (e.g., reports) published by, these support organizations to reveal additional Indigenous-led food procurement initiatives.

Throughout all three stages, we entered key initiative details (location, initiative type, leading organization, supporting organizations, related links, and a brief description of each initiative) into a database (Microsoft Excel). Subsequently, this Excel sheet was uploaded to Google MyMaps, free online software that transforms databases into geographic maps. On this map, each initiative is represented with a pin that is clickable for detailed information.[1] The pins are color-coded according to three layers of initiative categorizations:

(1) Initiative type (e.g., Indigenous co-op, community garden, community market, etc.);
(2) The type of group or organization leading the initiative (e.g., Indigenous community, not-for-profit organization, school board, healthcare institution, etc.); and
(3) The type of group or organization playing a supporting role in the initiative (e.g., not-for-profit organization, Indigenous community, school board, healthcare organization, government agency, etc.).

These categorizations allowed for an inquiry into general and jurisdiction-specific trends pertaining to alternative food procurement in Canadian Indigenous communities, along with the identification of key actors and support mechanisms in the field. Findings based on this inquiry are presented and discussed in the following section of this paper. These findings are derived from publicly available material posted by Indigenous organizations themselves and offer a respectful scan of their social-economy initiatives.

Findings and Discussion

The three-stage research process identified 167 place-based Indigenous food procurement initiatives across Canada. The largest numbers by far of these social-economy initiatives were community gardens and greenhouses (58), followed by co-operatives (42), school gardens (17), food markets (9), community-based food programs (9), harvesting and hunting initiatives (5), education and training (5), institutional food (4), community kitchens (2), procurement initiatives (2), and single initiatives including but not limited to a food aid program, a food bank, a food distribution center, a combined food market–community garden–greenhouse, and a harvesting and a hunting initiative focused on food aid. Overall, the findings suggest several

[1] The map of these initiatives can be found at https://www.google.com/maps/d/edit?mid=1oJUIKoPXI-_vVxB6kjEt-yWwV5x6Qmpu&ll=52.166426075353804%2C-97.79301950000001&z=3)

trends among these alternative food procurement initiatives.

1. Place-based

Very importantly, these initiatives are place-based and target local problems. These place-based initiatives have arisen in direct response to the placeless, faceless industrial food system at the heart of the unjust nutrition transition. This dysfunctional food system erases place and provenance and offers no opportunity for respectful relationships, depending instead on exploitative ones. In contrast, these Indigenous food procurement initiatives are rooted in place, meet the needs of local people (not corporate owners or shareholders), contribute to community development, and offer a glimpse of a place-based food system.

2. Indigenous-led

These initiatives are predominantly led by Indigenous communities and often are supported by other organizations. Across the country, initiatives are springing up that represent local leadership working to solve community food-related problems. The province of Manitoba is a prime example, as illustrated by the Northern Manitoba Food, Culture, and Community Collaborative (NMFCCC), a not-for-profit organization made up of an interconnected group of people, communities, organizations, and governments, which provides financial and technical support to Indigenous-led food initiatives. In a recent report, the NMFCCC (2017) highlighted 20 projects and thanked the many allies and partners who supported them. Another example of leadership and support is the partnership between Indigenous communities and CHEP Good Food Inc., a not-for-profit organization working to improve access to good food and promote food security in Saskatchewan. Besides supporting Indigenous-led food initiatives through various programs, CHEP also has a Good Food Box Program that procures food directly from Flying Dust Cree8 Worker Co-operative and Muskoday Growers Co-operative.

3. Gardens

There has been a surge in the number of community and school gardens, some of which evolve into co-ops, such as the small community garden and food market in Flying Dust First Nation in Saskatchewan that eventually turned into a co-operative that produces food for the local community (and beyond) and employs numerous community members. We found 58 community and school gardens, many of which are promoted by the NMFCCC in Manitoba. These gardens help to overcome colonially structured food deserts by working to improve food access, establish knowledge of gardening and healthy living, encourage food sharing, promote healthy eating habits, support community members in starting their own gardens, and even "change the local food system to reduce dependency on southern food supplies" (NMFCCC, 2017, p. 31).

4. Food Co-ops

Many of these initiatives are food co-operatives. This corroborates Wuttunee's (2010) finding that co-ops have been especially well used by Aboriginal people as a way to meet community needs. Of the 167 alternative food procurement initiatives we identified, 42 were Indigenous co-ops, many being in the far north where food procurement can be challenging.

5. Public Institutions

Hospitals and universities are becoming involved with traditional foods. For example, the Yukon Hospital Traditional Diet Program offers patients access to traditional food and medicine (Yukon Hospitals, 2018). Kwantlen Polytechnic University (British Columbia) provides education and training at the Tsawwassen First Nation Farm School, and the University of Western Ontario and the University of British Columbia host Indigenous school and community gardens.

6. Geographic Concentration

Lastly, the findings reveal that certain initiative types show high levels of geographical concentration in Canada. This concentration can be linked to the existence of federations and not-for-profit agencies that support Indigenous food initiatives through procurement, financing, technical and educational support, and the provision of a platform for knowledge exchange and collaboration. A

prime example is Arctic Co-operatives Limited, a co-op federation providing service and technical support to 32 Indigenous-owned and -controlled co-operative businesses located in Nunavut, the Northwest Territories, and the Yukon. These co-operatives provide a wide range of goods and services to the often remote and underserved Indigenous communities they serve, but food retail makes up the majority of their business activities (Arctic Co-operatives Limited, 2007). As a result, the map shows a very high concentration of Indigenous co-ops in these areas, where they are addressing food shortages and supporting community economic development. Another testimony to the importance of support organizations is the NMFCCC. Its support has enabled the proliferation of community gardens in the province of Manitoba, which has a much greater concentration of this initiative type compared with other provinces. These instances signal the significance of supportive organizations for individual Indigenous communities, which may lack the financial and technical resources to execute such initiatives. The broadening of co-operative relations between Indigenous communities and support organizations can accelerate the proliferation of Indigenous-led food procurement initiatives in Canada, especially by remote communities that are geographically and economically isolated.

Taken together, these findings bring into focus the role that place-based Indigenous alternative food procurement initiatives rooted in the social economy can play in overcoming the unjust nutrition transition and supporting a just transition to a place-based food system.

Reversing the Unjust Nutrition Transition

When calling for policies that encourage land-based activities as a means to mitigate the negative effects of adverse nutrition transitions, Samson (2016) notes that Indigenous foods and the exercise required to procure them are strongly associated with good physical and mental health. Testaments to this positive impact of place-based food initiatives can be found across Canada, but one specific case is worth mentioning here: Fox Lake Goose Camp, hosted by the Fox Lake Cree Nation in Northeastern Manitoba. For five days every spring, the children and youth from the community learn traditional goose hunting, preparation, and cooking methods from the elders in the community. The hunted meat is then shared among community members, who often lack access to highly nutritious local food options (Food Matters Manitoba, 2011). In addition, this initiative helps younger generations learn and retain traditional self-sustenance methods, which in turn strengthens their capacity to reverse the nutrition transition over the long term. The collective nature of procuring, preparing, and enjoying local goose meat has a significantly positive impact on the physical and mental health of community members, who are also able to preserve their culture and traditions through this multigenerational initiative.

Supporting a Just Transition

These place-based Indigenous food procurement initiatives can help to support a just transition to a place-based food system anchored in Indigenous food sovereignty and food security. While both are complex and contested terms, proponents of food sovereignty maintain that it is a precondition to genuine food security (McMichael, 2010; Patel, 2010).

Indigenous food sovereignty

While the concept of food sovereignty is fairly new, Morrison (2011) points out that the living reality of food sovereignty is not new for Indigenous communities; she goes on to argue that the "underlying principles of Indigenous food sovereignty are based on our responsibilities to uphold our distinct cultures and relationships to the land and food systems" (p. 97). Eschewing a strict definition, she maintains that the term describes the current strategies that both enable and support the capacity of Indigenous communities to sustain their traditional hunting, fishing, gathering, farming, and distribution practices. Crucially, she concludes, Indigenous food sovereignty provides "a framework for exploring, transforming and rebuilding the industrial food system towards a more just and ecological model for all" (p. 98). The place-based Indigenous alternative food procurement initiatives identified in this study

align with Morrison's description of Indigenous food sovereignty by adhering to traditional methods of relating to land and food while furthering Indigenous self-determination through direct control of and benefit from such initiatives. One specific type of initiative that can play a critical role in establishing food sovereignty for Indigenous communities is community-based food programs, which focus on food and nutrition from a comprehensive perspective. Involved with various activities around food and nutrition, these programs intend to build local capacity for exercising and establishing food sovereignty. An exemplar of community-based food programs is the Ithinto Mechisowin[2] Program (IMP) implemented by the O-Pipon-Na-Piwin Cree Nation (OPCN) in Northern Manitoba. In collaboration with local actors such as the OPCN Band, the local school, and local fishers' and trappers' associations, IMP provides training to youth on wild food and medicine harvesting, preparation, preservation, and cooking techniques. The food that is harvested and prepared is then distributed to 400 local community members based on availability, need, and number of family members (NMFCCC, 2016). Adhering to the principles of food sovereignty, IMP is "managed by a community committee that includes elders, teachers, health care professionals, fishers, and more" (NMFCCC, 2016, p. 1). A number of community members reported weight loss, lower levels of blood sugar, and reduced hypertension, thanks to their now-regular intake of wild food. Furthermore, the program has been recognized by community members for boosting their mental health as it helped them reconnect with traditional foods and healthier nutrition (NMFCCC, 2016). The OPCN suffered immensely, in the early 1970s, by flooding from the hydroelectric dam commissioning and subsequent displacement of the community from their traditional lands. Pursuing food sovereignty through a community-led program championing traditional forms of food procurement and preparation has helped heal community members both physically and mentally (NMFCCC, 2016, p. 1).

Indigenous food security

These place-based Indigenous alternative food procurement initiatives can also help to achieve a just transition to a place-based food system that is anchored in food security. Unlike food sovereignty, which involves a rights-based approach to food, food security focuses on access to food. It has been defined as:

> a condition that exists when all people at all times have physical, social, and economic access to food that is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation and health services and care, allowing for a healthy and active life. (Koç, Sumner, & Winson, 2017, pp. 385–386)

The Centre for Studies in Food Security (2018) at Ryerson University promotes the five As of food security: availability, accessibility, adequacy, acceptability, and agency. This focus is reflected in the Indigenous food procurement initiatives this study identified, which are most often started by Indigenous communities themselves and therefore grounded in a local understanding of food-related barriers and solutions. For instance, Hopedale and Rigolet Inuit Community Governments in Newfoundland began the path toward food security with a community-led food assessment (CLFA), which involved all members of the community in examining issues affecting access to food and developing solutions to overcome challenges in a locally appropriate manner (Food First Newfoundland, n.d.). Subsequently, both Hopedale and Rigolet communities decided to establish community gardens and also join a Good Food Box program run by support organization Food First Newfoundland, which allows them to order food in bulk and thereby share the cost of shipping while choosing for themselves the types of foods that are ordered. These projects were implemented during a time when the only local store was selling overpriced (e.g., CA$70 per turkey), low-grade, and often freezer-burned meats,

[2] Ithinto Mechisowin means "from the land" in Cree language.

and a ban on hunting caribou had come into effect in Rigolet (Food First Newfoundland, n.d.). Following its CLFA, the Hopedale community also decided to expand and enhance its community freezer program, which funded local hunters to provide meat for low-income families and for elders who have no family to hunt for them. These residents are provided with one piece of frozen meat per month, while supplies last (Food First Newfoundland, n.d.). Overall, grounded in an understanding of local food-related issues, the solutions put forth by communities in Hopedale and Rigolet were guided by a vision that is rooted in an Indigenous food sovereignty approach that has led to greater food security. As a result, the communities themselves determined the way in which they wanted to further the five As of food security.

Conclusion

Place matters. In particular, place shapes our lives because of its intimate interplay with food and food practices (Fitzpatrick & Willis, 2015). Its impact can be dramatic, whether in urban slums, rural outbacks, world-class cities, or Indigenous communities, but it is not all predetermined. Place-based limits can be turned to advantage, especially for those who 'know their place.'

In spite of centuries of dis-placement and exclusion, Indigenous people have maintained their relationship to place and thus can offer an unparalleled experience of place-based food systems. In this paper, we presented an overview of place-based initiatives that are having a demonstrably positive impact on alternative food procurement in Indigenous communities. We provided context for these initiatives, mapped them, highlighted the trends among them, and discussed how they help to overcome the colonially structured food deserts that characterize the unjust nutrition transition and to support the just transition via the social economy to a place-based food system, anchored in Indigenous food sovereignty and food security.

Such initiatives have much to teach us when developing place-based food systems if we want them to reach their potential of not only re-valuing the local, but also fostering socio-ecological sustainability (Klassen & Wittman, 2017). The lethal legacy of colonialism and exploitation in Indigenous communities in Canada must be exposed and ultimately undone, as has been demanded by the Truth and Reconciliation Commission (TRC, 2015). By turning to the communities to develop both culturally appropriate and economically linked alternative food procurement initiatives through organizational forms they choose, such as the social economy, this part of the lethal legacy can be slowly undone, and the solutions they develop can illuminate a just transition to a place-based food system for all.

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Sacred harvest, sacred place: Traditional land uses and food in Wasagamack First Nation

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Abstract

This paper tells a place-based story of food in the Wasagamack territory in Manitoba, Canada, through traditional land-use map biographies with 49 active Indigenous harvesters, video interviews with eight key informants, and input from community workshops. Although harvesters in Wasagamack First Nation do not depend solely on wild foods, map biographies show that traditional land uses remain important and occur throughout their ancestral lands. This land remains pristine, with virgin boreal forests, natural flowing waters, and abundant wildlife, and occupied almost exclusively by Indigenous people who continue to harvest wild foods and speak their language fluently. All Wasagamack people interviewed (*N*=57) regarded the land to be perfect as the Creator made it, and sacred; they did not want development interfering with their traditional practices of hunting, gathering, and fishing and with their land-based spirituality, despite the community economic and infrastructure poverty. In opposition, the province of Manitoba, which governs natural resources, favors mining and settler development and is unsupportive of traditional stewardship of the land. Mapping traditional land use enabled the exploration of the cultural and ecological dimensions of Wasagamack

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food over time and territory, providing an important tool for food researchers to explore food sovereignty, wild food access, and foodsheds.

Keywords
Foodshed, Traditional Land Use Mapping, Wild Food, Food Environments, Food Sovereignty, Indigenous

Introduction

The people of Wasagamack First Nation in Canada connect intimately with their ancestral land through food, as well as through history, environmental stewardship, culture, language, and ancestral knowledge. This fly-in community in northeastern Manitoba, like many remote Indigenous communities in Canada, obtained all their basic needs, including food, from their territory until the middle of the 20th century (Kuhnlein et al., 2006; LaDuke, 2002; Paci, Tobin, & Robb, 2002). But does harvesting wild food play into the continuing food story of the Wasagamack people? This paper is unique in mapping traditional land use of an Indigenous community to explore the cultural and ecological dimensions of food over time and territory.

Land-use mapping has been employed by Indigenous communities to tell "their 'story' of their use of land and resources" (Calliou Group, 2010, para. 9) but not by food researchers to describe foodsheds, food environments, and wild food access. Traditional land-use studies countermap Indigenous territory in order to challenge industrial or settler development in courts of law (McIlwraith & Cormier, 2016). For example, the Inuit Land Use and Occupancy Project helped the Inuit reclaim sovereignty of the Northwest Territories, through comprehensive land claims (Freeman, 2011).

The possibilities for land-use mapping were explored to inform the Wasagamack vision of land-use planning and Indigenous food sovereignty. Indigenous food sovereignty involves First Nation people, including youth (Frouse, 2018), in defining their "strategies and policies and develop[ing] food systems and practices that reflect their own cultural values around producing, consuming and distributing food" (Coté, 2016, p. 8). Indigenous food sovereignty is not only contingent on the ecological integrity of their lands and waters for the sustainability of wild foods but also demands that people have a strong cultural foundation of Indigenous knowledge (Cidro, Adekunle, Peters, & Martens, 2015). Indigenous knowledge is expert knowledge of animal, plant, and fish habitats to live sustainably on their ancestral territory through hunting, fishing, trapping, gathering, and gardening. Indigenous knowledge and practices are required for these activities, as well as ceremonies (Ballard, 2012). Indigenous knowledge is embedded in language and in *aki*, the *Anishinimowin* word for earth, inclusive of land and water (McLeod, 2014). Awareness of place shapes the knowledge, skills, and lifestyles required for sustainable wild food acquisition (Ballard, 2012).

For wild food to be harvested sustainably, the foodshed must have ecological integrity (Friedmann, 2014). Foodshed conservation protects the source of food, similar to how watershed conservation protects the drinking water supply (Friedmann, 2014). The foodshed encompasses the people engaged in harvesting, transporting, preparing, and eating, as well as the places these occur.

This paper tells the Wasagamack First Nation's traditional food story, from precolonial times into the future, regarding their vision for their ancestral lands. After introducing the community and describing the study methods, this paper constructs a place-based story through interviews, traditional land-use mapping results, and research literature. A systematic literature review found only limited studies of food access and environments in rural and remote northern communities (Health Canada, 2013). In particular, wild food access by Indigenous peoples is rarely researched (Health Canada, 2013; Parker, Burnett, Hay, & Skinner, 2018). Viewing traditional land-use studies through a food lens has the potential to expand the literature in the under-researched area of Indigenous food sovereignty.

The *Anishiniwuk* of Wasagamack

Oji-Cree is the term used by settlers and the government to describe the Island Lake dialect spoken in Wasagamack First Nation and its people (Statistics Canada, 2016). However, *Oji* is considered a derogatory word, meaning a fly or its offspring, the

maggot, so this term does not appear in this paper. *Anishiniwuk* is used for Island Lake people in line with a recent press release from the Chiefs of the four First Nations in Island Lake: "We are not part Cree or part Ojibwe, we are *Anishiniwuk*, a distinct and sovereign nation with rights that deserve to be respected" (*Winnipeg Free Press,* 2018, para. 5). This paper applies *Anishininew* for the communities in Island Lake and *Anishinimowin* for their language (Froese, 2018). Most people (64%) in Wasagamack identify *Anishinimowin* as their mother tongue and as the primary language used at home and some workplaces. As *Anishinimowin* names say a great deal about the history and geographical attributes of the location, name origins were sought out as part of this research.

Wasagamack is one of four *Anishininew* communities in the Island Lake area within the vast swath of roadless communities on the east side of Lake Winnipeg near the Manitoba-Ontario border. Wasagamack means "bay" in *Anishinimowin*. Island Lake was described as being as remote as the North Pole before air transport (Fiddler & Stevens, 2003), with 30 portages on the canoe route from Norway House to Island Lake making motorboat travel impossible (Hallowell, 1938). Wasagamack remains roadless today and is only accessible by winter road, plane, or canoe. By ice-road to Winnipeg, the largest urban center in Manitoba, is approximately 1500 km (930 miles), taking 17 to 20 hours, or, by plane, approximately 610 km (380 mi), taking 1.5 hours and CA$370 one-way. Plane travel is further complicated and expensive as Wasagamack lacks an airport, requiring 12 kilometers of open water travel from the airport at St. Theresa Point. During freeze-up and break-up, getting to the airport requires a helicopter trip, costing as much as CA$700 one-way. A connecting road to an urban center or even the other reserves is not expected to start construction until 2050.

Subsistence harvesting provides a mixed economy in Wasagamack, augmented with money from government social programs. Social services available in the community consist of a federally operated nursing station, one school for K-12 students, a band office (the band is the basic local unit of government in the Canadian First Nation system), and a postal station. The community has a gas station, and in 2019, as part of this research, a housing and sawmill enterprise was formed, Mitik 299 Corp. However, Wasagamack has neither a grocery nor any other store, nor any bank, restaurant, hotel, etc. The only grocery store in the area, the Northern Store, is located on a separate island away from Wasagamack, requiring a CA$5 boat trip to buy costly food, much of which is ultra-processed.

The Wasagamack First Nation reserve spans 80.9 square kilometers and is home to a population of 1,403 people, residing in 285 houses (Statistics Canada, 2016). At 4.9 people per house, the average household is more than twice as crowded as the Canadian average at 2.4 people (Statistics Canada, 2016). The median income in Wasagamack is CA$11,499, which is only one-third of the average Canadian's income of CA$34,204 (Statistics Canada, 2016).

Methods for Telling the Place-Based Food Story of Wasagamack

This study started with a request in 2011 by the Wasagamack Chief and Council to Dr. Thompson to assist with a traditional land-use and occupancy study. In response, Dr. Thompson with Wasagamack and the other Island Lake communities applied successfully for funds for the *Mino Bimaadiziwin* Land-Use Project. Funding was obtained through both the Social Sciences and Humanities Research Council (SSHRC) and Wabanong Nakaygum Okimawin (WNO, "East-Side Planning") to employ two local community coordinators as well as graduate students to research traditional land use. A partnership grant further developed this work.

Two approaches were employed to explore the place-based food story of Wasagamack: documenting the story of Wasagamack in Island Lake, and mapping traditional land uses on ancestral territory. Emma and Victor Harper, with Dr. Thompson, developed the historical timeline for Island Lake, verifying drafts with many Elders and in community workshops. Without a recorded, written history available for the region, interviews provided oral histories of events, augmented by references to Island Lake and Indigenous food in the literature (Fiddler & Stevens, 2003; Hallowell, 1938; Hughes, 1979; Indian & Northern Affairs Canada, 1969;

Sinclair, 1999; Thapa, 2018; Tough, 1997; Wasagamack First Nation, 2010). Eight key informants from Wasagamack (chiefs, councilors, Elders, researchers) consented to share their interviews about land-use planning on video and disclose their names. Participatory research (mapping, videos, workshops, etc.) involved the University of Manitoba's Dr. Thompson, Keshab Thapa, Jerome Harper, and Veronica Wojtuszewska working alongside Wasagamack First Nation community coordinators.

Regarding mapping traditional land uses, the method was developed by seven Island Lake community coordinators with Dr. Thompson and Terry Tobias during a 60-hour workshop (Kamal & Thompson, 2014; Thompson, Rony, Temmer, & Wood, 2014). The methodology was designed to provide the highest standard of evidence in court for First Nations to reclaim their ancestral territory (Thompson et al., 2014; Tobias 2000; Tobias 2009). The Island Lake Traditional Land Use and Occupancy Survey Data Collection Manual (Kamal & Thompson, 2014; Thompson, 2013; Thompson et al., 2014) documents the rigorous and comprehensive protocol. The research ensures that Wasagamack First Nation Owns, Controls, gains Access and Possesses (OCAP) the data, following OCAP First Nations research ethics, in a way that built Wasagamack community capacity (Wilson, 2008). In addition, all interviewees signed the University of Manitoba ethical protocol consent form.

The Wasagamack land-use coordinators, Johnathon and Victor Harper, undertook traditional land-use map biographies with 49 active harvesters, usually in *Anishinimowin*. These coordinators asked the 67 questions in the written manual and conducted interviews according to the ethics protocol (Thompson et al., 2014). The 49 people interviewed included harvesters in each of the seven Wasagamack traplines, which cover all the major lakes in their ancestral territory, to ensure that the sample was geographically representative. The ages of the 57 interviewees (49 harvesters and 8 experts) were between 25 and 80. All but five were men, partly because of gender bias in the community, which considers trappers, fishers, and hunters to be appropriate roles for men. Generally, women engage in harvesting activities too, although over a small area, but have more significant roles than men in food storage and preparation. Harvesters recorded their successful harvests from hunting, fishing, trapping, and gathering for family sustenance on hard copies of maps at the 1:50,000 scale and signed written consent forms to share their data sites and information anonymously. The interview process took half an hour to a few hours.

The harvesting sites from each map biography were digitized into the geographical information system (GIS), ArcGIS 10. Although each harvester received a copy of his/her map biography, only 33 of the 49 harvesters underwent a verification interview with Norah Whiteway. Participants generally reported that their map biographies were accurate, without any wrong or missing data; only one map needed slight corrections. Furthermore, at many different events and workshops, feedback was obtained about summary maps, thematic maps, videos, reports, and a historical timeline of land use. Table 1 summarizes the activities resulting from this research.

Mapping the foodshed was done by combining the government trapline administrative area with the 49 community members' harvesting sites and a radius of 14.25 km (8.85 miles) around moose harvest sites to account for habitat (Novak, 1981). As moose have the largest habitat (638 km^2 or 246 mi^2) of any land animal hunted for food in the boreal forest, this habitat area should account for the habitat of all other animals (Novak, 1981).

Findings of the Place-Based Food Story of Wasagamack in Island Lake

The timeline (Figure 1) identified four historical periods: (1) pre-colonial *mino bimaadiziwin*, (2) colonial times, (3) reclamation of *mino bimaadiziwin*, and (4) post-colonial *mino bimaadiziwin*. Because the families in Wasagamack territory were governed by the Island Lake band until 1969, the first section tells the broader story of Island Lake from pre-colonial times through most of the colonial period. After 1969, the story focuses on Wasagamack First Nation but within the broader context of the Island Lake region.

Table 1. Products and Processes to Document Traditional Land Uses in Wasagamack First Nation (FN)

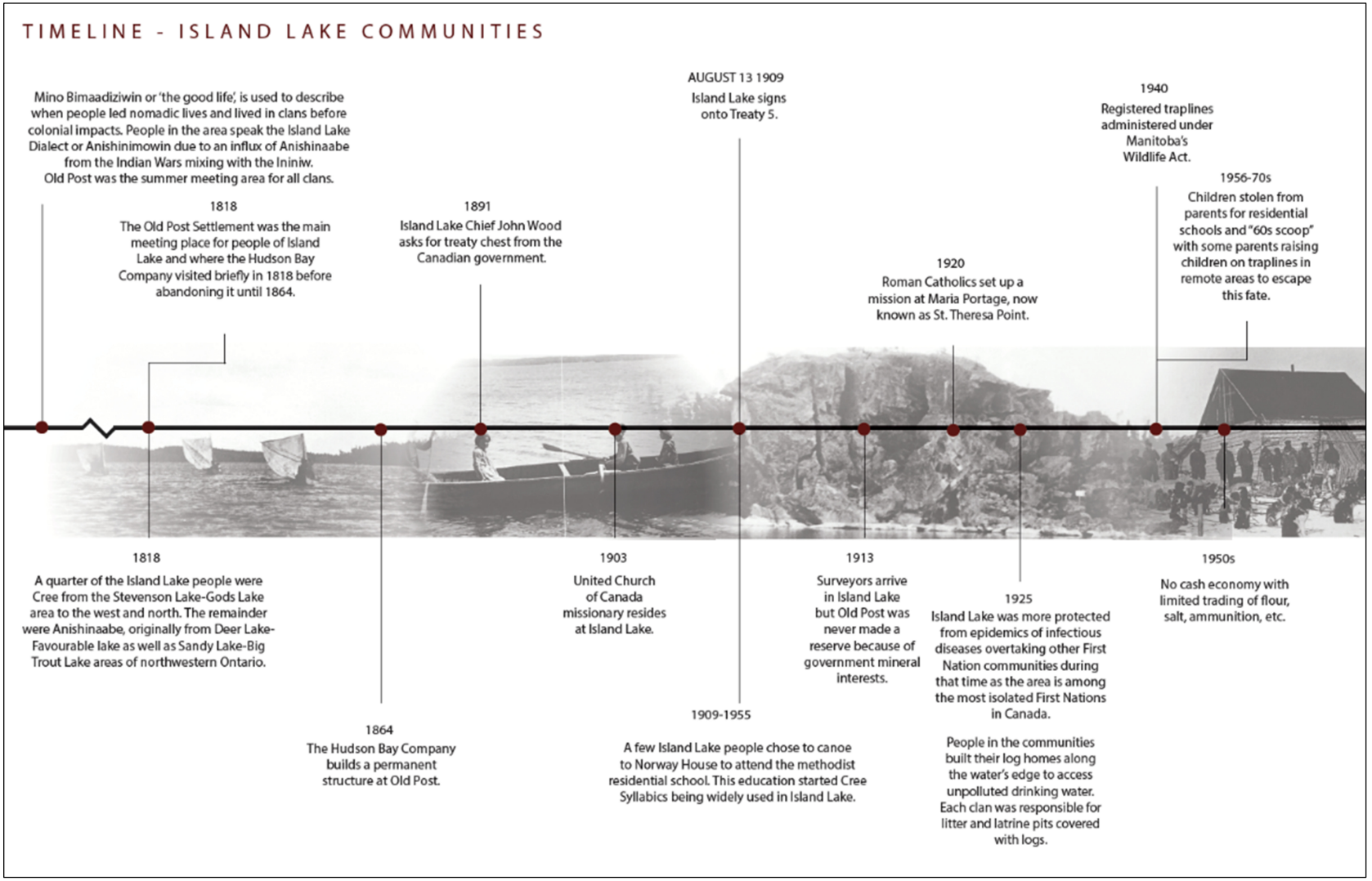
Activities	Products and Processes of Traditional Land Use Research
Capacity-building on land use	• Two coordinators from Wasagamack First Nation (FN) trained and developed a method with written interview protocol in a 60-hour workshop in 2012. • Annual land use workshops and presentations in the community from 2012 to 2017. • Community people attended FN traditional land use training programs in 2016 in Thunder Bay (four people) and 2017 in Winnipeg (nine people).
Map biographies	49 traditional land use and occupancy maps were developed that considered trapping, hunting, fishing, berry picking, medicinal plant gathering, timber harvesting, community and recreation areas, and youth training areas, as well as sites (cabins, campsites, old community and gathering sites, burial sites, spiritual sites, special sites).
Participatory video documentary	Eight people were interviewed to develop a video documentary of community voices on their vision for land use of Wasagamack FN (https://youtu.be/i4p9dpuBT4A). Many other videos of Elder workshops and interviews were taken to preserve this information, such as https://youtu.be/NODQq7ZiRhU, but not all are published.
Database of digital maps	An electronic database was archived with all traditional land-use data points and *Anishinimowin* names through community coordinators, Island Lake Tribal Council, and the University of Manitoba. The *Anishinimowin* place names were provided to the provincial topnymist for official recognition.
Reports and maps for feedback	Reports, maps, and timeline were presented for verification to Chief and Council, and at Elders gatherings and schools from 2013 to 2017. After four drafts, a final coffee table book copy is going to press in 2020 for Wasagamack participants with the findings, historical timeline, and maps.

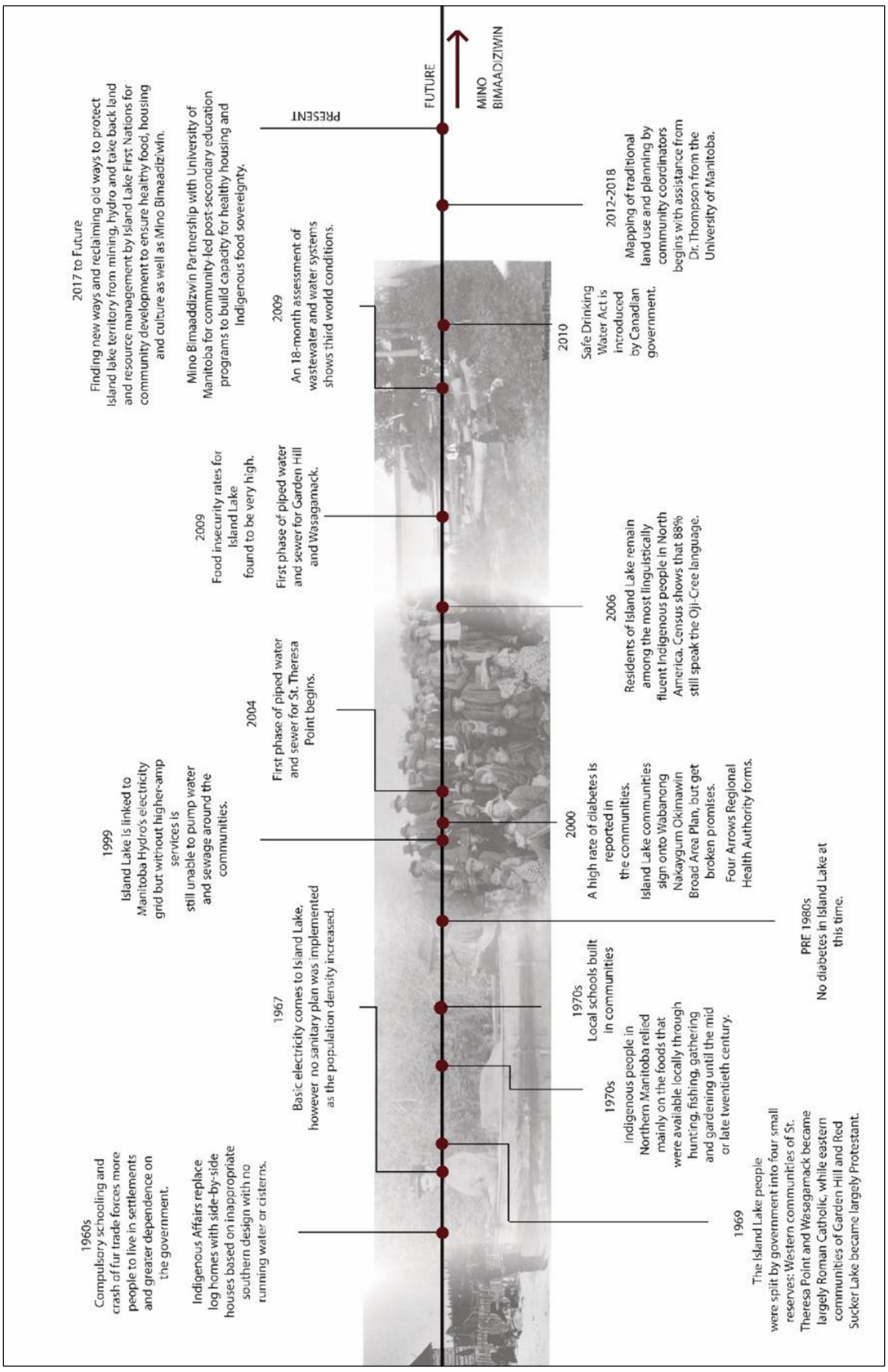
Pre-colonial *Mino Bimaadiziwin*

Mino bimaadiziwin is the term Wasagamack people use to describe the spiritual and good life that people led in pre-colonial times, which led to a general state of well-being and food security. People in Island Lake ate a local wild food diet, which had many health benefits. The merits of the wild food diet are apparent from the archeological findings of ancient Indigenous skeletons with excellent dental health and without arthritis despite having reached advanced ages (Price, Roburn, & MacKinnon, 2009). Kuhnlein et al. (2006) report significant pharmacologic and therapeutic benefits of wild foods, which are low in unhealthy fats, sodium, carbohydrates, and sugar but high in complete proteins and other nutrients (Batal et al., 2018). These foods protect against chronic diseases, such as diabetes, cancer, and cardiovascular diseases, as well as many other negative health conditions such as obesity (Thompson, Gulruhk, Alam, & Wiebe, 2012). Other physiological benefits are obtained from the aerobic and muscle-building activities involved in harvesting, gathering, and preparing wild foods. Although nature has cycles of productivity, wild foods were generally abundant in pre-colonial times, providing a good life in Island Lake.

Spiritual practices were an essential part of *Anishiniwuk* culture. Conservation practices were applied to reduce pressures on wildlife, with the *Anishiniwuk* population dispersed in small family camps across a wide area and traveling extensively to harvest (Wasagamack First Nation, 2010). Sharing wild foods, harvesting, and performing ceremonies on the land are pivotal to Indigenous culture (Cidro et al., 2015; Wilson, 2003), as part of a complex social system to balance sustaining the earth with the needs of people (Hughes, 1979). In exchange for Indigenous people stewarding, harvesting, and learning from *aki*, the earth was believed to regenerate abundance (LaDuke, 2002). In this world view, practices include making an offering before harvest for reciprocity, taking only what one needs, and then offering a feast of the first harvest. Reciprocity ensures sustainability and balance, as does speaking to the Anishiniwuk relatives who have hoofs and wings. An Elder stated, "When I was young, all the animals talked, just like in the cartoons, providing teachings." Communicating directly with animals provides useful information to protect both animals and people. Jackson Beardy, the famous woodlands artist from Island Lake, explained his painting being about birds keeping canoeists safe by warning them of impending storms before the water turns rough on the lake (Hughes, 1979).

Figure 1. Historical Timeline of Wasagamack within the Island Lake Context (written by Harper, Harper, and Thompson)




1960s
Compulsory schooling and crash of fur trade forces more people to live in settlements and greater dependence on the government.
Indigenous Affairs replace log homes with side-by-side houses based on inappropriate southern design with no running water or cisterns.
1967
Basic electricity comes to Island Lake, however no sanitary plan was implemented as the population density increased.
1969
The Island Lake people were split by government into four small reserves: Western communities of St. Theresa Point and Wasagamack became largely Roman Catholic, while eastern communities of Garden Hill and Red Sucker Lake became largely Protestant.
1970s
Indigenous people in Northern Manitoba relied mainly on the foods that were available locally through hunting, fishing, gathering and gardening until the mid or late twentieth century.
1970s
Local schools built in communities
1999
Island Lake is linked to Manitoba Hydro's electricity grid but without higher-amp services is still unable to pump water and sewage around the communities.
2000
A high rate of diabetes is reported in the communities.
Island Lake communities sign onto Wabanong Nakaygum Okimawin Broad Area Plan, but get broken promises.
Four Arrows Regional Health Authority forms.
2004
First phase of piped water and sewer for St. Theresa Point begins.
PRE 1980s
No diabetes in Island Lake at this time.
2006
Residents of Island Lake remain among the most linguistically fluent Indigenous people in North America. Census shows that 88% still speak the Oji-Cree language.
2009
Food insecurity rates for Island Lake found to be very high.
2009
First phase of piped water and sewer for Garden Hill and Wasagamack.
2009
An 18-month assessment of wastewater and water systems shows third world conditions.
2010
Safe Drinking Water Act is introduced by Canadian government.
2012-2018
Mapping of traditional land use and planning by community coordinators begins with assistance from Dr. Thompson from the University of Manitoba.
2017 to Future
Finding new ways and reclaiming old ways to protect Island lake territory from mining, hydro and take back land and resource management by Island Lake First Nations for community development to ensure healthy food, housing and culture as well as Mino Bimaadiziwin.
Mino Bimaaddizwin Partnership with University of Manitoba for community-led post-secondary education programs to build capacity for healthy housing and Indigenous food sovereignty.
PRESENT
FUTURE
MINO BIMAADIZIWIN

Nature and animals, as well as Elders, are considered the most important teachers by the *Anishiniwuk*. The land and all life are considered to be gifts from the Creator. The relationship between *Anishiniwuk* and animals is not merely predatory but is relational and complex. The Creator ensured the survival of people through negotiating a sacred pact on the part of animals and plants to sacrifice themselves for food, clothing, and housing in exchange for humans stewarding and respecting the land (Hughes, 1979), as illustrated by a story about a moose (Bruchac, 1992). The story begins in a lodge, which signifies the spirit realm, where a young bull moose agrees to be sacrificed in answer to the *Anishiniwuk* hunters' prayers for success in their hunt in order to feed and clothe their families. The story ends with the *Anishiniwuk* eating the moose and showing the body respect:

> After they [the Indigenous hunters] killed [the moose], they thanked him. . . . That night, the young bull moose woke up in his lodge among his people. Next to his bed was a present given to him by the human hunters. He showed it to all of the others. 'You see,' he said, '. . . It is right for us to allow the human beings to catch us.' And so, it is to this day. Those hunters who show respect to the moose are always the ones who are successful when they hunt. (Bruchac, 1992, p. 72)

The clan system, with each clan represented by a distinct animal, enacts a close family-like relationship between humans and animals. Emma Harper identified the main clans of the Wasagamack people as the bear and wolf clans, who intermarried with moose, eagle, sucker, pelican, crane, sturgeon, caribou and other clans. People from the same animal clan are considered to be family, even when not related by blood. Identifying so strongly with nature and wildlife results in active stewardship to protect *aki* and their relatives, the animals. These relations not only maintain the cosmological and spiritual balance in nature but the ecological balance and their food supply. These spiritual and cultural practices were challenged during the colonial period, however, with negative impacts on both ecology and food supply.

Colonial times

Colonial policies and the fur trade fostered overhunting and land-use changes. Before the Island Lake region ever saw a European, migratory birds declined in their area and Indigenous refugees arrived. *Anishinaabe* people moved to Island Lake to seek sustenance and peace when overhunting by Europeans endangered many species, including bison, lake sturgeon, trumpeter swans, whooping cranes, passenger pigeons, Canadian geese, and ducks. Before the Europeans settled the west, plains bison and wood bison numbered an estimated 30 million and 170,000, respectively. By the late 1800s, plains bison no longer existed in Canada, and wood bison numbered about 200 (Olson, 2019). Because Indigenous people depended on wildlife for food, shelter, tools, and clothing, they were impoverished by the demise of abundant wildlife, such as the bison, particularly in southern Manitoba and Ontario, but to a lesser extent the north, where there were moose and caribou to live on. However, not only wildlife was under attack; the *Anishinaabe* and other Indigenous peoples moved west and north to avoid armed conflicts with settlers. The Cree that originally inhabited Island Lake welcomed the *Anishinaabe* people from the western Great Lakes and Boundary Waters region in the late 1700s. Island Lake was a refuge, then untouched by European contact, with its remoteness delaying both colonial forces and the spread of communicable diseases (Hallowell, 1938).

With Hudson Bay Company (HBC) came the first Europeans to Island Lake for the fur trade, bringing the idea of land ownership. In 1670, a charter by the British Crown gave HBC control over Island Lake as part of Rupert's Land (Tough, 1997). Hudson Bay Company claimed exclusive rights to trade and to colonize all lands with rivers flowing into Hudson Bay. Rupert's Land was an enormous territory, including northern Québec and Labrador, northern and western Ontario, all of Manitoba, most of Saskatchewan, south and central Alberta, parts of the Northwest Territories and Nunavut, as well as small sections of the United States. This takeover was based on the doctrine of discovery and *terra nullius* (Latin, "empty land"), although in reality, the land was fully occupied at the time by Indigenous peoples. In 1818 HBC

briefly visited Island Lake but abandoned the area almost immediately, then returned in 1864 to Old Post to build a permanent fort to barter furs from local people for goods, including sugar, alcohol, blankets, rifles, and flour.

The fur trade played havoc with food security and *mino bimaadiziwin* in Island Lake (Tough, 1997). The fur traders disrupted the *Anishiniwuk* way of life by bringing European diseases, for which *Anishiniwuk* had no immunity. HBC undermined *mino bimaadiziwin* by creating dependency on alcohol and unhealthy food as well as encouraging overhunting. For example, demands for European fashion crashed beaver populations (Tough, 1997), which fell steadily from 6,000 beaver pelts traded in Island Lake in 1865 to 2,000 beaver pelts in 1870 to below 500 per year in 1890 (Tough, 1997). As beavers are a keystone species, creating conditions for wildlife abundance through ecosystem engineering with their dams, this decline changed the landscape and its productivity (Tough, 1997). Beaver numbers remained low for a century, rebounding only recently. Another assault on food security was overhunting of migratory birds by European settlers in the late 1800s in North America to the brink of extinction (National Geographic Society, 2019). HBC reported food scarcity and hunger among the *Anishiniwuk* trading at Island Lake in the early 1900s (Fiddler & Steven, 2003). Although food security in Island Lake declined, the *Anishiniwuk* continued to harvest from their vast territory of land and feed their families healthy foods.

The fur trade was already declining when HBC sold Island Lake, as part of Rupert's Land, to the Canadian government in 1870. As the HBC charter to this land was based on the falsehood of *terra nullius*, the legitimacy of this subsequent land deal is also flawed. In 1876 the Indian Act legally restricted Indigenous peoples to small plots of land that Canada called Indian Reserves (Palmater, 2014). After this massive land deal in Island Lake, Island Lake dodged the bullet for a time, remaining free of any contact with the Canadian government and settlers until the 1900s. The following passage depicts the pristine, unceded, and unsettled nature of Island Lake in 1907:

> Southeast on Island Lake. . . . It is a territory that soldiers have never before penetrated. It is a territory that has never seen a permanent western settler. This territory has not been ceded to the Canadians. (Fiddler & Stevens, 2003, p. 72)

Soldiers with dog teams traveled to Island Lake in 1907 to arrest a powerful shaman. Toppling the *Anishiniwuk* spiritual leader by the Canadian government amounted to a regime change, making way for treaty signing. In 1909 the Chief of Island Lake, representing 649 *Anishiniwuk*, signed an adhesion to Treaty 5 with Canada in their summer meeting place at Old Post fort (Mckay, 2018). A historian from Island Lake, Peter Mckay, describes the Treaty 5 process as "unfinished business," as the treaty commissioner never returned "to honor his promise nor the original spirit and intent of the full Treaty-making process" (Mckay, 2018, p. 2). In the written Treaty, the Crown obligations promised hunting, fishing, and farming implements:

> Provide 160 acres of land for a family of five or in the proportion for larger or smaller families, . . . [continue the] right to pursue hunting and fishing throughout the tract [that is unoccupied],…pay sum of five hundred dollars per annum every year in the purchase of ammunition, and twine for nets, supply farming and gardening tools [that includes two hoes, one scythe, one axe and one spade per family; one plow for every ten families; five harrows for every twenty families; and one cross-cut saw, one hand-saw, one pit-saw, the necessary files, one grindstone, and one auger for each band], and compensate for the value of any improvements on the reserves. (Indian & Northern Affairs Canada, 1969, para.13, 16 , 17, 19, 20, 23, & 24)

This treaty agreement was not met, as vividly shown by the treaty cheque from 2015 addressed to the Wasagamack First Nation on display at the Canadian Human Rights Museum (CHRM) (Figure 2), providing a pittance for an entire community's implements for acquiring food for 20 years (Thompson et al., 2014), according to

CHRM signage that states:

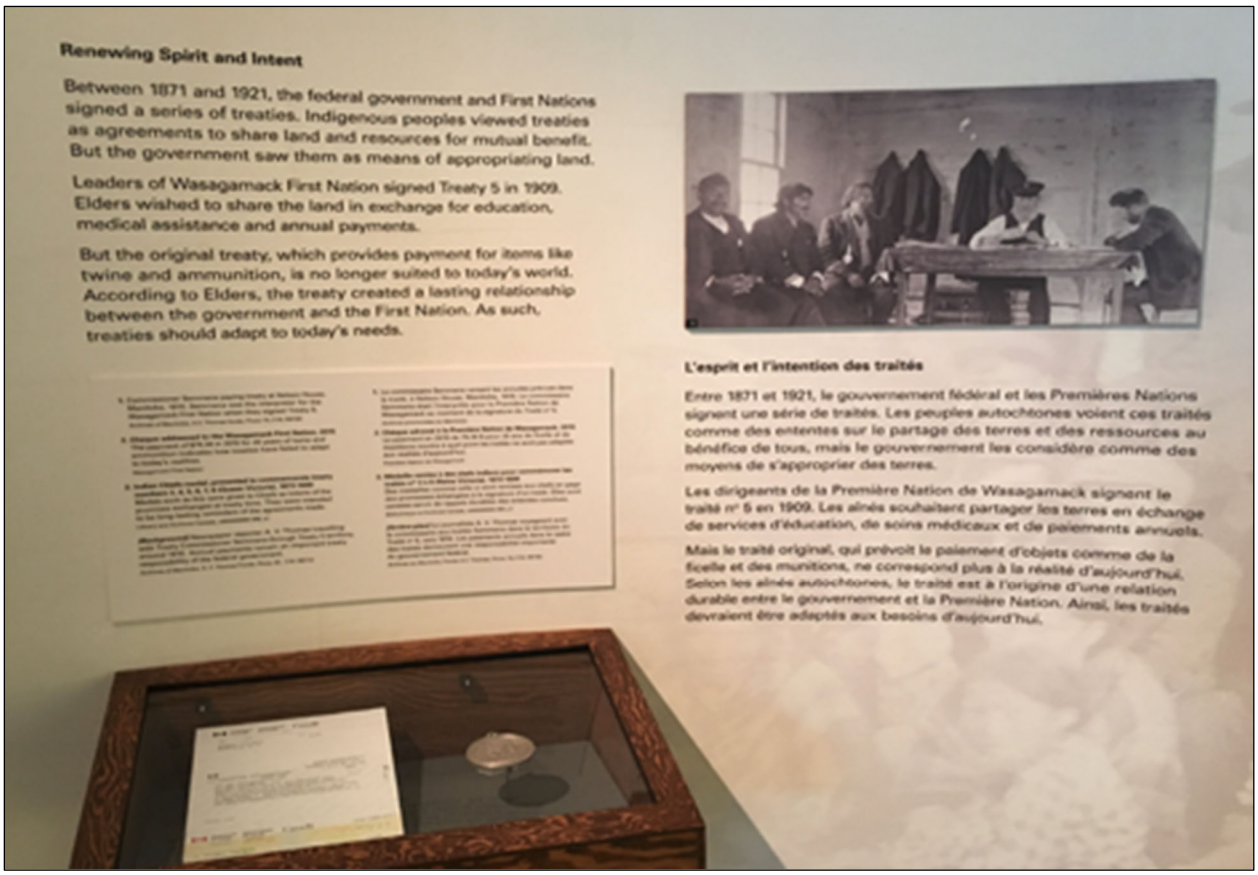
> The payment of [CA]$79.38 in 2015 for 20 years of twine and ammunition indicates how treaties have failed to adapt to today's realities. "According to the Elders, the treaty created a lasting relationship between the government and the First Nations. As such, the treaties should adapt to these needs." (Canadian Museum for Human Rights, 2018)

The meager payment of less than CA$100 is insufficient to provide food subsistence material for one family for one year when a fishing net costs more than CA$100 today. Certainly this amount would not meet the needs of 1,500 people over 20 years.

The government of Canada surveyed and described treaty lands, but missed large areas in the Island Lake region. According to the treaty map of the Treaty Relation Commission of Manitoba (TRCM), three large expanses are not covered by any treaties in Manitoba, in the Island Lake region amounting to more than 1.5 million hectares. Canada unilaterally governs according to the text of the treaties and not on the basis of oral history, interpreting the treaties as surrendering the land, which is a contestable point. However, the land not ceded by treaties belongs to the Island Lake communities (Tough, 1997). The *Anishiniwuk* only learned about this unceded land as part of this research, in 2018.

Soon after the treaty, the Dominion of Canada directed people to move from Old Post to find a place with grassland in order to pursue agriculture, including animal husbandry. Island Lake Chief George Knott moved 11 families to the shore of Wasagamack Bay, where the community remains to the present day. However, most *Anishiniwuk* families continued to live in their family camp areas,

Figure 2. Photo at Canadian Museum of Human Rights of the Wasagamack Cheque of CA$79.38 for 20 Years of Treaty Rights for Food Implements



throughout their massive territory, until the 1960s and 1970s. Until 1969, Island Lake was represented by one chief. After 1969, Wasagamack and the other First Nation bands became an administrative unit, each with its own chief and council. The Island Lake bands increasingly fell under government rules and regulations (Tully, 1999).

The treaty promised a local school (Ontario-Manitoba Boundary Commission, 1955). Genocidal residential school policies were adopted in Canada in 1867—"to take the Indian out of the child"—but Island Lake children until the 1950s were untouched by these policies, continuing to learn Indigenous knowledge systems from the land and Elders. Until the advent of floatplanes, *Anishiniwuk* children were largely free from far-off residential schools, as families were dispersed in their remote camps. The book *Cowboys and Indians: The Shooting of J.J. Harper* describes how the RCMP came with floatplanes to take seven-year-old Victor Harper from his family camp to residential school:

> They [Victor Harper and J. J. Harper] had spent their early years in the bush, where their families fished and hunted and trapped. The two boys grew up speaking Oji-Cree, immersed in the culture and the customs of the Island Lake people . . . until a float-plane swooped across the water, like a bird of prey. A man in a red coat Victor assumes was a Mountie got out and began rounding up the school-aged children. . . . The Jack River school, a big stone building, became their prison. (Sinclair, 1999, pp. 43-44)

Victor recounted his experiences of physical, sexual, and emotional abuse. Many First Nation children suffered abuse during this systematic assimilation process undertaken through the power of the state, with church and RCMP support (Sinclair, 1999). After elementary school, Victor and J. J. attended Assiniboine Residential Secondary School, amounting to more than a decade of residential school imprisonment.

From Victor's story, Island Lake children clearly did not escape the compulsory school requirement. However, only one generation of students was taken away, compared to the removal of three or four generations in most other First Nation communities, due to the remote nature of the community. Then, after the Roman Catholic Church was built in 1954 on an Island near Wasagamack, an elementary school was opened in the church. With a local school, the *Anishiniwuk* began to settle in Wasagamack during the school year, to protect their children from abduction. Settling for school turned the seasonal pattern of *Anishiniwuk* travel for harvesting upside down, away from congregating on reserve from fall to spring and traveling to family camps from summer to fall. The school taught colonial, Christian doctrine, replacing the tutelage of children by Elders, animals, and the land. Children were not removed from their families, language, and culture to attend elementary school. However, they still were sent to residential schools for secondary school education.

While settlers did not compete for food and land in Island Lake with the *Anishiniwuk*, mining interests did. Manitobans were exploring the Island Lake area for gold, finding rich potential, at the time of the Manitoba-Ontario border survey in the 1920s. With "considerable mining development… [in] close proximity to the said boundary," (Peters & Rorke, 1925, p. 9) Manitoba disputed the Crown's decision to put "the eastern point of Island Lake" in Ontario (Peters & Rorke, 1925, p. 10), rather than in Manitoba. To facilitate economic growth from mining in Manitoba, the disputed boundary was shifted "from Island Lake to Hudson Bay…across the Laurentian Shield, a distance of about 110 miles," (Ontario-Manitoba Boundary Commission, 1955, p. 6). As a result, Monument Bay's greenstone belt—a zone of volcanic and associated sedimentary rock, often rich in gold, silver, copper, zinc, and lead ores—falls within Manitoba, which would have devastating consequences in the twenty-first century for Island Lake people.

The *Anishiniwuk* , like other Indigenous people, were oppressed by colonial policies that subjugated Indigenous peoples and communities in many ways, including not allowing Indigenous people to hire lawyers, outlawing Indigenous ceremonies until 1951, and withholding voting rights until 1960. These policies deprived First Nation people

of land and resources as well as disrupting ceremonies and culture transmission (Tully, 1999). In this research, Victor Harper shared his 60-year-old secret, that ceremonial and sacred objects were buried to prevent their destruction by colonial powers. Victor wanted to return these objects so that his community could experience healing, pointing to the map to show their hiding place:

> The federal government was abolishing all the ceremonies and rights of native people. So, the people of Kalliecahoolie Lake, Bolton Lake, and this area decided to hide a ceremony. The ceremonies are hidden here somewhere. Somewhere, we don't know where. It's a small lake, and when you go to that lake, you will hear a humming sound. The reason that it is humming is that the ancestral people fixed the rocks, so the wind goes through the rocks . . . But if we find that place, we find our culture and our way of life. Not to say, we will live the way they did. But spiritually we can live like them and lead a good life. And that is why we want to go there. (Thompson, Harper, & Klatt, 2017)

Victor believed that retrieving the artifacts of these ceremonies would reset the community on a spiritual path towards *mino bimaadiziwin* and be a source of healing for the *Anishiniwuk* culture, land, and people.

During the colonial period, not only Indigenous land and spirituality were under attack but foodways as well. Since the 1970s, the wild food diet in Wasagamack has transitioned slowly to the ultra-processed food typically sold at the Northern Store (Thompson et al., 2012). Processed foods, compared to wild foods, have lower nutritional values for calcium, folacin, iron, vitamins, and fiber, but higher fat and sugar ratios (Batal et al. 2018; Kuhnlein et al., 2006). These foods are nutrient deficient and loaded with excessive calories (Batal et al., 2018). The dietary transition of Indigenous peoples from a traditional diet to processed food has led to dental caries, lowered resistance to infection, higher rates of obesity, diabetes, chronic diseases, and higher food insecurity (Batal et al. 2018; Willows, Hanley, & Delormier, 2012).

Price blames colonial diets for the degeneration of Indigenous health: "No era in the long journey of mankind reveals in the skeletal remains such a terrible degeneration of teeth and bones, as this brief modern period records" (1939, p. 11). The excessive amounts of sugar found in processed food are blamed for the high rates of poor dental health for Indigenous children in Canada, with 85% of Indigenous children ages three to five experiencing dental decay and 80% of Indigenous children six to eleven afflicted with dental caries (Mathu-Muju, McLeod, Walker, Chartier, & Harrison, 2016).

Indigenous peoples experience higher rates of most chronic and infectious diseases, as well as lower life expectancy, compared to other Canadians (Statistics Canada 2016). The prevalence of type 2 diabetes among First Nations populations is four to five times higher than the rest of Canada (Young, 2000). However, the type 2 diabetes rate is higher still in Wasagamack and the other Island Lake communities, where children as young as eight have been diagnosed with type 2 diabetes (Young, 2000).

The Northern Store is the only store in the region, selling overpriced and unhealthy food. This market vulnerability compromises food security in Island Lake (Thompson et al., 2012). A research study found food insecurity rates in Wasagamack to be very high, with 79% of households experiencing some form of food insecurity and 35% of households having severe food insecurity (Zahariuk, 2014). These rates reveal the enormous economic inequities inflicting remote Indigenous people, with First Nation people in Island Lake having ten times the food insecurity rate of other Canadians (Sen, 1986).

Food safety requires access to safe drinking water. Regional remoteness and government underfunding of reserve infrastructure delayed piped water access in Wasagamack until after 2009 and limited pipes to a few houses, while cisterns were installed in most houses between 2009 and 2015. Wasagamack First Nation was described as a "northern community [that] follows a traditional lifestyle and has crowded housing, primitive toileting and lacks running water" (Sinha, Martin, Sargent, McConnell, & Bernstein, 2002, p. 77).

Cistern water has both quality issues, with high rates of bacterial contamination (Indian Affairs & Northern Development, 2006; Lebel & Reed, 2010), and quantity issues, as many people report running out of water regularly before the next water truck delivery (Harper, Whiteway & Thompson, 2018). At least 10% of houses continue to use buckets for water and sewage (Harper et al., 2018), which poses real health risks to hundreds of people. The World Health Organization (2004) identifies safe, treated water in homes as a critical determinant of health. Health impacts of unsafe drinking water include acute gastritis, stomach ulcers, dermatological conditions, birth defects, respiratory infections, neurological dysfunction, and death (Indian Affairs & Northern Development, 2006; Jones et al., 2012; Uemura et al., 2001; World Health Organization, 2004). In Wasagamack, 95% of the community members, as young as six weeks old (Sinha et al., 2002), screened positive for the bacterium *Helicobacter pylori (H. pylori),* a major cause of stomach cancer and some types of lymphoma of the stomach.

Canadian funding models and policies regarding food and water in First Nation communities undermine sustainable livelihood and food security (Thompson et al., 2012). Infrastructure funding is limited to a per capita formula, which particularly shortchanges remote northern communities by failing to account for the high costs to fly in materials and build on the Canadian shield in permafrost. Funding limitations and other policies result in inadequate infrastructure for water supply and sewage, as well as housing, that undermines human rights, health, and traditional food cultures. The bias of the Canadian government against wild food is apparent in their policies to subsidize corporate food through Nutrition North Canada, which competes unfairly with healthier but unsubsidized wild food (Thompson et al., 2012). Provincial public health regulations prohibit serving wild meat and ungraded fish in public venues such as schools, hospitals, and stores, so there is no capacity to market these foods to offset harvesting expenses (Thompson et al., 2012). In the face of high costs to access the family camp areas by floatplane and for equipment, the government provides no support for hunting, fishing, and gathering. The Canadian bias against wild foods and Indigenous peoples extends to the lack of funding for educating *Anishiniwuk* youth about Indigenous foodways and knowledge systems.

Reclaiming Mino Bimaadiziwin

In 1987 Wasagamack began an effort to reclaim *mino bimaadiziwin* and resurrect Indigenous knowledge systems through traditional education on the land. Twelve Elders with two public school teachers, Victor and Emma Harper, organized the *nopimink* (on-the-land) education program to share their ancient teachings. These 12 Elders grew up learning from *aki*, parents, and Elders, having never experienced the residential school or colonial day school system.

The hands-on *nopimink* education taught people traditional foodways by immersion on the land with Elders. A log school, called the Allan Wood School, was erected in Allan Wood's family camp in Stevenson River to allow students to learn about all aspects of the Indigenous food system:

> [Students] shot and butchered a moose… during the course, students were introduced to herbal medicines, rabbit snaring, traditional values, and traditional teaching ways. . . . They set nets and preserved fish. (Harper & Harper, 2000, p. 12)

Families were invited to live on the land with these Elders, undertaking hunting, fishing, gathering, and ceremonies. The Elder Martin Wood describes Elders as academics of the traditional educational system, with their Indigenous knowledge:

> Elders tell me that this was good planning in seeking the academics of the traditional education system. . . It is hoped that while the student is in school, he will be given a chance to learn about his own education system. . . There are many teachings in this area that were left by the Elders. (Harper & Harper, 2000, p. 11)

Although the true Elders that learned from *aki* are getting old and dying, their knowledge is being

passed on, according to Charlie Harper: "The Elders of the past are in heaven, but their footsteps are still on earth" (Harper & Harper, 2000, p. 12).

Student teachers from Island Lake, through the Brandon University Native Teacher Education Program (BUNTEP), also earned a university credit course in *nopimink* towards their teaching degree. Although Elders workshops in Wasagamack continue each year, sadly, the government closed the doors on BUNTEP in 2012, eliminating funding support and certification courses for teachers or youth in Wasagamack about traditional foodways and *nopimink*.

The 12 Elders teaching nopimink were also part of a research project to locate *Anishinimowin* place names on maps to preserve Indigenous knowledge and to document history (Harper & Harper, 2000). The *Mino Bimaadiziwin* mapping project with 49 harvesters built on this community-led research work and digitized their work, passing the names to a topnymist for official recognition of *Anishinimowin* place names. Map 1 summarizes all the information collected, with titles and labels in *Anishinimowin* in order to provide some written resources for this oral language. The harvest sites concentrate around *wakaihkan* (log houses) and are adjacent to *nipi* (water). Wasagamack land use is not only in and around Island Lake but also includes the *aki* around many other lakes (Kalliecahoolie, Stevenson, Bigstone, Bennett, Makwa, Muskwa, Knight, Fairy Rock, Kitchi, Amos, Willows, etc.) and rivers (Gunisao, Stevenson, Mainland, Joint, etc.).

Map A1 (Appendix) shows that Wasagamack people regularly travel great distances to harvest food for their family, with aerial distances of 136 km (85 mi) to the west, 52 km (32 mi) to the north, 82 km (51 mi) to the east across the Ontario border, and 103 km (64 mi) to the southwest (Thapa, 2018). Rather than a linear path, canoe routes and ski trails follow meandering rivers, which increases distances. *Anishiniwuk* generally travel with their family to their family camp at least once a year, despite the time required of one week or more to paddle or portage, or the expense required of CA$300 to CA$400 dollars for one-way floatplane travel. Dog sledding, snowmobiling, and taking ice-roads provide means of travel in the winter.

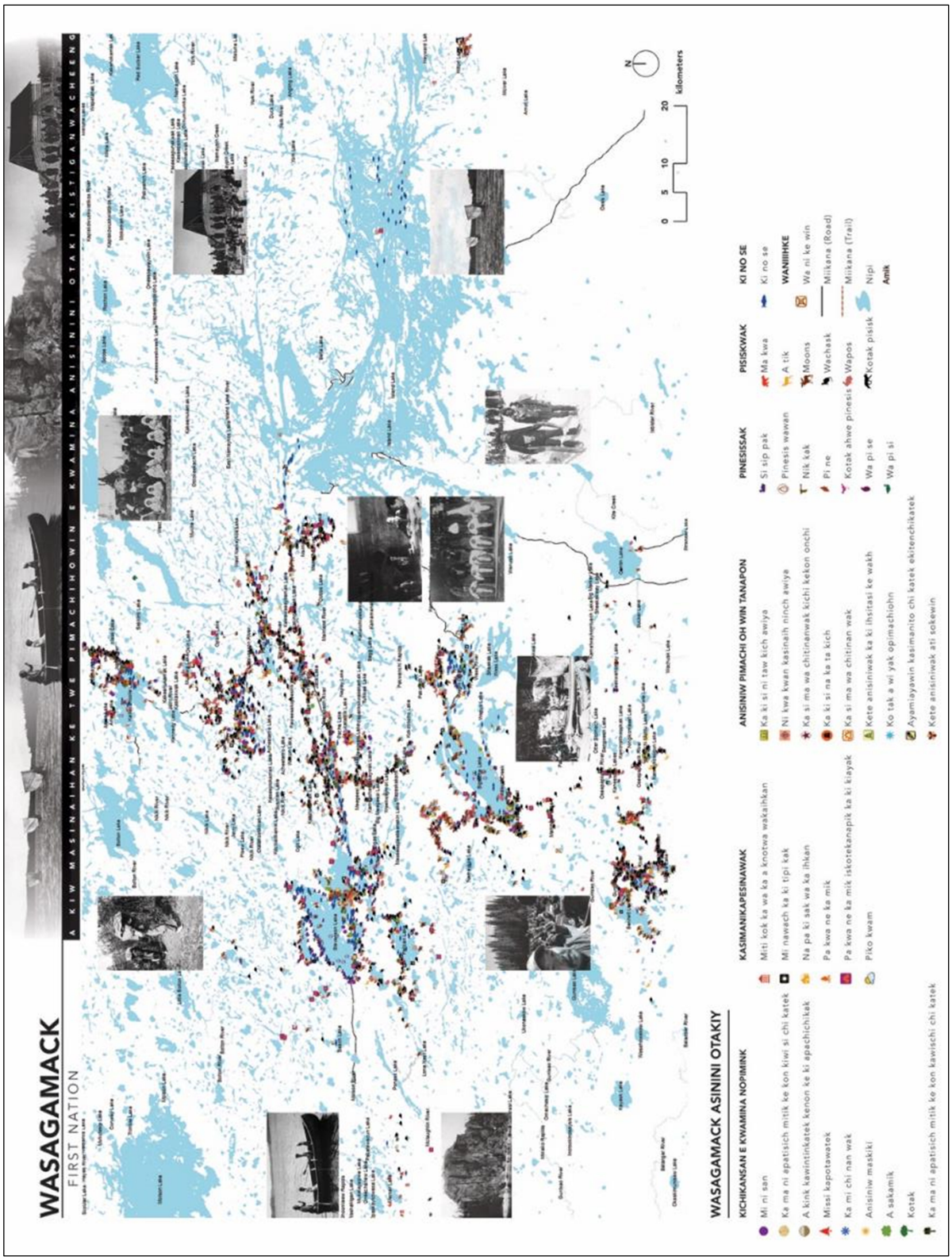
Thematic maps focused on Indigenous food systems were undertaken and are included in the Appendix: Map A2 for fishing, Maps A3 and A4 for hunting, Map A5 for gathering, and Map A6 for trapping. The people of Wasagamack mainly harvest fish, moose, beaver, muskrat, geese, ducks, grouse, rabbit, and bird eggs within their traditional territories, as well as occasionally ptarmigan, loon, swan, and other animals. People fish most intensively in the fall, which coincides with moose, duck, and geese hunting season.

Fish are the staple food in the north (Thompson et al., 2012), as illustrated by a story about a fish competing with a moose to see who supplies the most food to the *Anishiniwuk*. The moose brags: "I am so gigantic I can provide a feast for an entire community." But the fish laughs: "Moose run away when hunted. But not fish. Fish swim right into the nets, providing the Anishiniwuk easy access and more food." The moose is a sore loser in this competition, stepping on the fish's head, which is why the jackfish has a long, flat snout.

Moose, beaver, muskrat, and ducks, and geese are semi-aquatic, which helps explain why most harvest sites cluster around lakes and rivers. For example, moose wade to eat aquatic plants, swim, and cool off, and *Anishiniwuk* lasso and pull moose underwater from their boats. Moose is culturally important as well as a favorite food: killing a moose is considered a sign of passage from child to adult. Traditionally, an *Anishiniwuk* man, when wanting to marry, gave his beloved's mother a moose head to demonstrate that he was a good provider.

Bird hunting typically is done at greater distances from the reserve and cabins than for other food, as shown in Map 4A. However, Wasagamack harvesters usually collect berries, food plants, medicines, mosses, and specialty woods for smoking fish and other uses, as well as earth materials, close to their cabins. Traditional medicinal harvests are crucial to human health (Uprety, Asselin, Dhakal, & Julien, 2012), with weekay, Labrador tea, and other medicines traditionally gathered when fully developed in late summer or early fall. Hallowell (1938) recorded seeing wild rice west of the Island Lake region in much earlier times, and wild rice is harvested today from Kalliecahoolie Lake for special feasts.

Map 1. Summary Map of Traditional Land Uses of Wasagamack Anishiniwuk with Titles and Labels in Anishinimowin (*N*=49)



The province has designated family camping areas, where people traditionally hunted and trapped, to be colonial administrative boundaries called traplines. Traplines are displayed in Map 7, along with the locations the 49 harvesters reported setting their traps. Today the province manages trapline resources by requiring the head trapper and other trappers to purchase annual trapping licenses (Tough, 1997). Although trapline areas are often used to define Indigenous territory for consultation purposes, this research found the traditional land-use area in Wasagamack is much more extensive than the trapline boundaries. The foodshed is a more accurate representation of Wasagamack territory than the trapline boundaries, but the watershed is the scale needed to protect land uses.

Foodshed of Wasagamack First Nation

The Wasagamack First Nation foodshed area is estimated to be 13,378 square kilometers, fully considering Wasagamack traditional land uses, trapline boundaries, and wildlife habitat. This territory, based on ecological habitats and traditional land uses, provides a better estimate of the Wasagamack traditional territory than the traplines, which are based on the provincial government's rough estimate of family camping areas.

The foodshed operates within the Hayes watershed, which needs to be protected as watershed changes can impact the foodshed. *Anishiniwuk* discussed in meetings and interviews how a hydroelectric dam would obliterate traditional land uses and have worse negative impacts than mining on both land and water traditional uses. Many *Anishiniwuk* drink water directly from the lakes; they also tend to hunt, trap, and gather in or adjacent to water bodies. While water pollution impacts water quality downstream, dams and water control structures affect both upstream and downstream water quality and quantity, to impact wildlife and traditional pursuits. As a result, the Hayes watershed is also marked in Map A7, so as to identify the watershed as critical to conserving the foodshed, recognizing that dams that fluctuate water flow would undermine the cultural and ecological integrity of the Island Lake region.

Community-led development, traditional land uses, and intact ecosystems are considered more important than gold to *Anishiniwuk*. Wasagamack community members repeatedly stated that industrial mining development—exploration, mining claims, drilling—by outsiders is not wanted and would undermine their traditional pursuits and their Indigenous rights. In opposition, the provincial government claims jurisdictional authority over all natural resources in Wasagamack beyond the reserve, prioritizing unsustainable mining rather than sustainable traditional uses (Manitoba Government, 2011). The province passed Land Use Planning Act Regulation 81/2011, dictating that in regions considered rich in valuable mineral resources, "dominant land use should be exploration and extraction," that "the best and only use of greenstone belts is mining" and "greenstone belts . . . must be identified and protected from conflicting surface land uses that could interfere with access to the resources" (Manitoba Government, 2011, p. 40, p. 39). The passage of Regulation 81/2011 violated the duty to consult, which is required in the Canadian constitution (McGregor, 2013; McIlwraith & Cormier, 2016). This was particularly grievous, as First Nations were engaged with the province in the Wabanong Nakaygum Onimawin planning initiative at the time (Manitoba Government, 2016). Only in 2017, when Island Lake Tribal Council staff wanted the entirety of their ancestral land to be protected, did the province counter that Regulation 81/2011 made that impossible due to the many greenstone belts in Island Lake. These greenstone belts are near lakes, such as Bigstone, Knight, Wass, and Clam, as well as rivers important for food procurement.

The province of Manitoba is extensively marketing mining development in Island Lake. After gold veins at Bigstone and Knight Lakes in Wasagamack territory were recently discovered, the province began advertising at a mining conference that the area is free for claiming. Similarly, at Monument Bay in the Island Lake region, rather than evicting the mining company as requested by the Red Sucker Lake First Nation (RSL), Manitoba courts evicted the First Nation for trespassing on their own territory.

Looking for other ways to preserve Wasagamack ancestral land and foodways, counsel on how to achieve United Nations World Heritage status

was sought (UNESCO, 2018). The UNESCO status protects Pimachiowin Aki's approximately three million hectares of a boreal ecosystem, the territory of four Indigenous communities, from industrial development. Although the Wasagamack territory is similar to Pimachiowin Aki, also on the east side of Lake Winnipeg and also roadless, the Province claims that Island Lake is ineligible due to its greenstone belts (Rinne, 2017). As a last resort, the community is staking their own mining claim in order to ensure that strict cultural and environmental protocols are followed, but doing so without any government support.

Post-colonial Mino Bimaadiziwin and Indigenous food sovereignty

The community vision for overcoming colonially imposed poverty and underdevelopment and for achieving *mino bimaadiziwin* is through community development and Indigenous food sovereignty. The community researcher, Johnathon Harper, summarized the 49 map biographies and his interview research regarding the future development of Wasagamack: "The land is perfect the way it is. People do not want to see any industrial development, only community development in their territory."

Despite their poverty and lack of community infrastructure, all Wasagamack people who were interviewed did not want industrial development that desecrates their land. Wasagamack people clearly reject the dominant model of development that has wreaked havoc with ecosystems and cultures throughout the world. The *Anishiniwuk* view community-led development as the solution. Their priorities include food sovereignty, *nopimink*, community-led education, and infrastructure, including adequate housing and a community airport, to bring about reconciliation, renewal, and healing from the effects of residential schools and other colonial policies.

Towards community-led post-secondary education at Wasagamack, the *Mino Bimaadiziwin* Partnership was developed in 2017 with the University of Manitoba and other universities and colleges, as well as social enterprises (Thompson, 2017). The Partnership is furthering the community development plan for Wasagamack land use focusing on Indigenous food systems and healthy housing through post-secondary education. This community-led and projects-based college education has the potential to transform education and food policy, as well as build capacity locally in Wasagamack. This partnership includes three First Nation communities but also most public post-secondary colleges and universities in Manitoba, as well as a number of social enterprises. This partnership provides instructional capacity and research resources to explore optimal solutions to resolve development challenges through applied adult education (Thompson, 2017). By conducting participatory action research, this collaboration is leapfrogging Indigenous development and post-secondary education from colonially imposed to self-determined and community-led educational development.

As part of this effort, Wasagamack post-secondary students in the *Mino Bimaadiziwin* Partnership education program faced off in a Dragons' Den entrepreneurship competition against 63 First Nation communities and won third place with their dream of a community college in their community teaching Indigenous food systems (Harper & Harper, 2019). The prize of CA$550,000 will renovate their decommissioned school into a restaurant and country food kitchen (Thompson, 2019). Thus, post-secondary students will have a place in their community to be trained in traditional foods.

Conclusion

Two primary components of Indigenous food sovereignty, specifically ecological integrity and cultural integrity, endure in Wasagamack despite Canada's brutal colonial rule. Its remoteness and culture have given Wasagamack a unique history. Indigenous food systems and traditional land uses continue to be possible due to Island Lake and the Hayes Watershed lacking settlers, as well as dams and industrial, development. Wasagamack ancestral land has robust ecological integrity, with untouched boreal forests, clean waterways, and abundant, diverse wildlife. Traditional land-use map biographies chronicle how *Anishiniwuk* continue to harvest, steward, and conduct ceremonies over their territory. This sacred communion with the land and animals ensures that wild food is har-

vested sustainably in a way that nourishes stable traditional culture. Elders who have been unimpacted by residential schools continue to animate Indigenous knowledge systems and encourage wild food pursuits. As a result, most *Anishiniwuk* have a strong cultural foundation, continuing to harvest wild foods and speaking their Indigenous language fluently (Statistics Canada, 2016).

The foodshed was estimated from the 49 harvester map biographies, traplines, and habitat requirements. For wild food to be harvested sustainably, the foodshed must continue to have ecological integrity, protecting habitat for wildlife (Friedmann, 2014). The foodshed defines the territory more accurately than the colonial artifact of traplines and should be used for consultation rather than trapline boundaries. However, to preserve the foodshed for traditional land uses, conservation of the entire Hayes watershed is paramount.

Foodshed and watershed conservation would benefit immensely from *Anishiniwuk* leading Wasagamack land management and planning, due to their Indigenous ecological knowledge and practices (Jojola, 2013; McGregor, 2013; Tauli-Corpuz et al., 2018). As a result of their intimate and sacred relationship with the land, *Anishiniwuk* prioritize their ancestral land above all else, seeing *aki* as perfect the way the Creator made it. Their Indigenous approach to conservation can be expected to be more successful, consistent with a review of 29 case studies in Asia and Latin America by Tauli-Corpuz, Alcorn, & Molnar (2018), which found better outcomes for conserving biodiversity, forest cover, and, thus, wild food when led by Indigenous peoples rather than led by others.

Mino bimaadiziwin is the term used by Wasagamack people to describe the spiritual and good life of their ancestors on the land, prior to colonization, as well as the Wasagamack vision for the future. Wasagamack people prioritize culture, ecological integrity, and wild food over gold and other riches. In contrast, the province continues to prioritize mining over sustainable development and reconciliation. This focus is demonstrated by the province's actions to shift the Manitoba-Ontario boundary in the early 1900s, passing Regulation 81/2011 without consultation, and peddling gold veins in Island Lake to mining companies. It is to be hoped that even when pitted against powerful mining interests aligned with the government, foodshed maps, unceded land, *nopimink* education, and partnerships will provide important tools for building Indigenous food sovereignty and for regaining *mino bimaadiziwin*. In stewarding their ancestral land and biodiversity, Wasagamack is protecting Indigenous food sovereignty.

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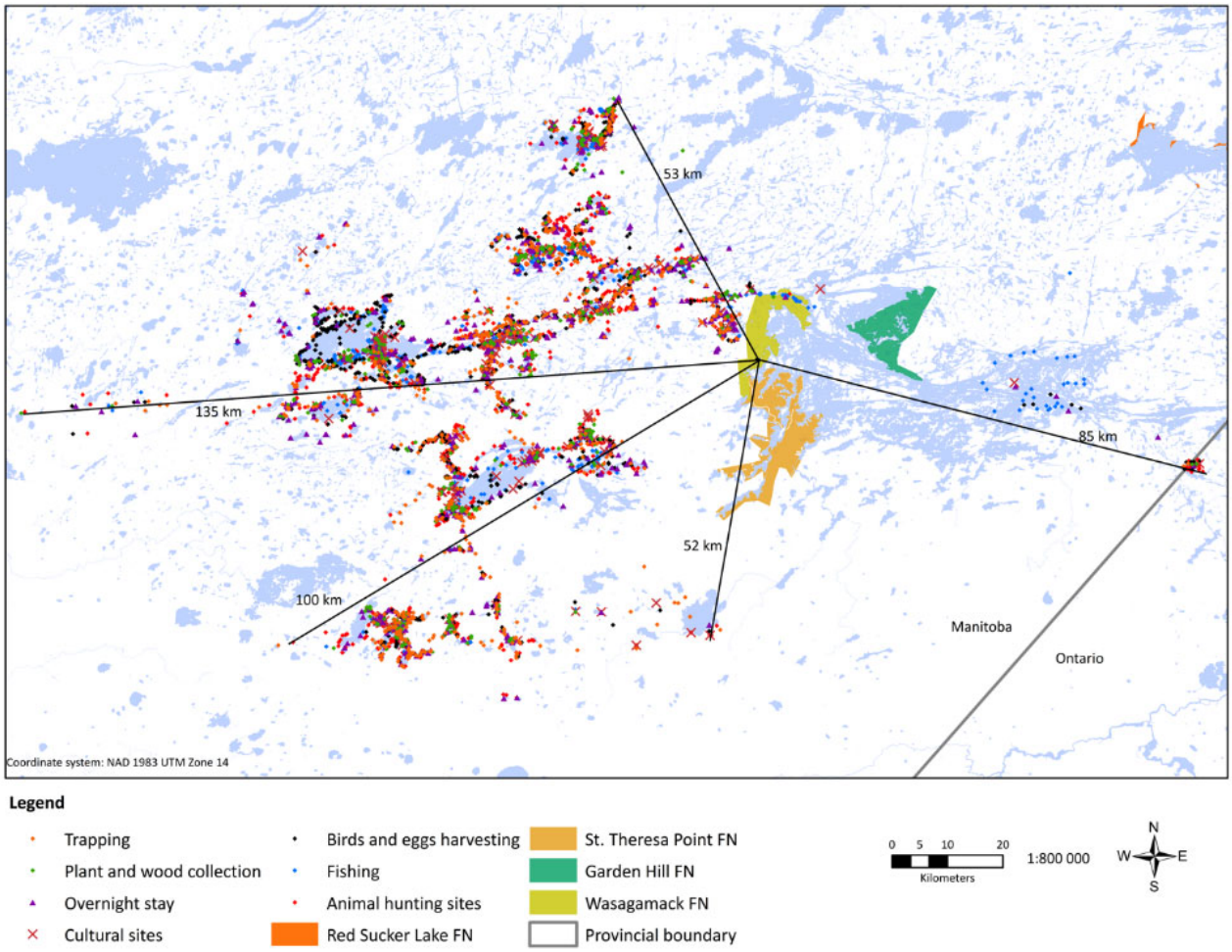
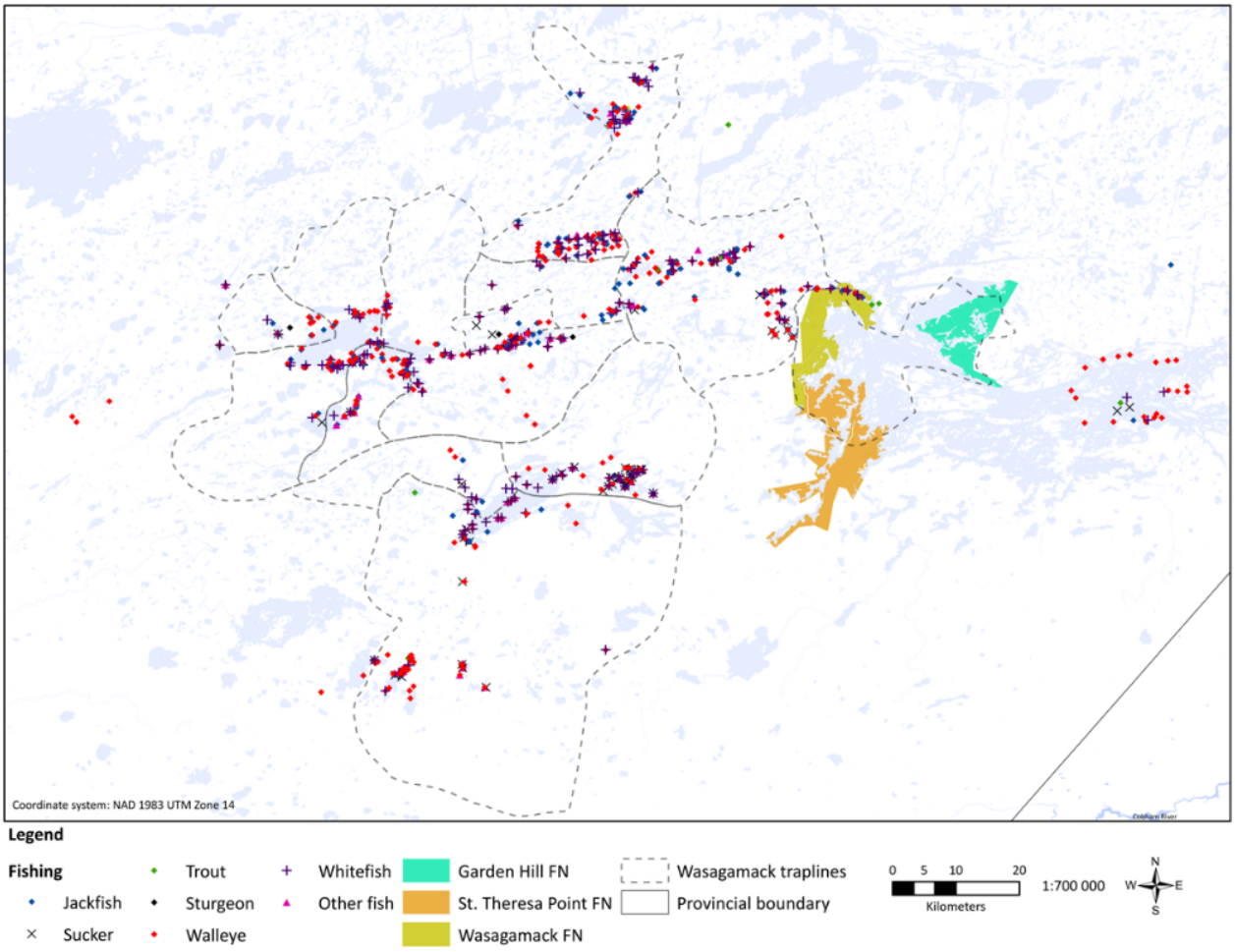
Appendix

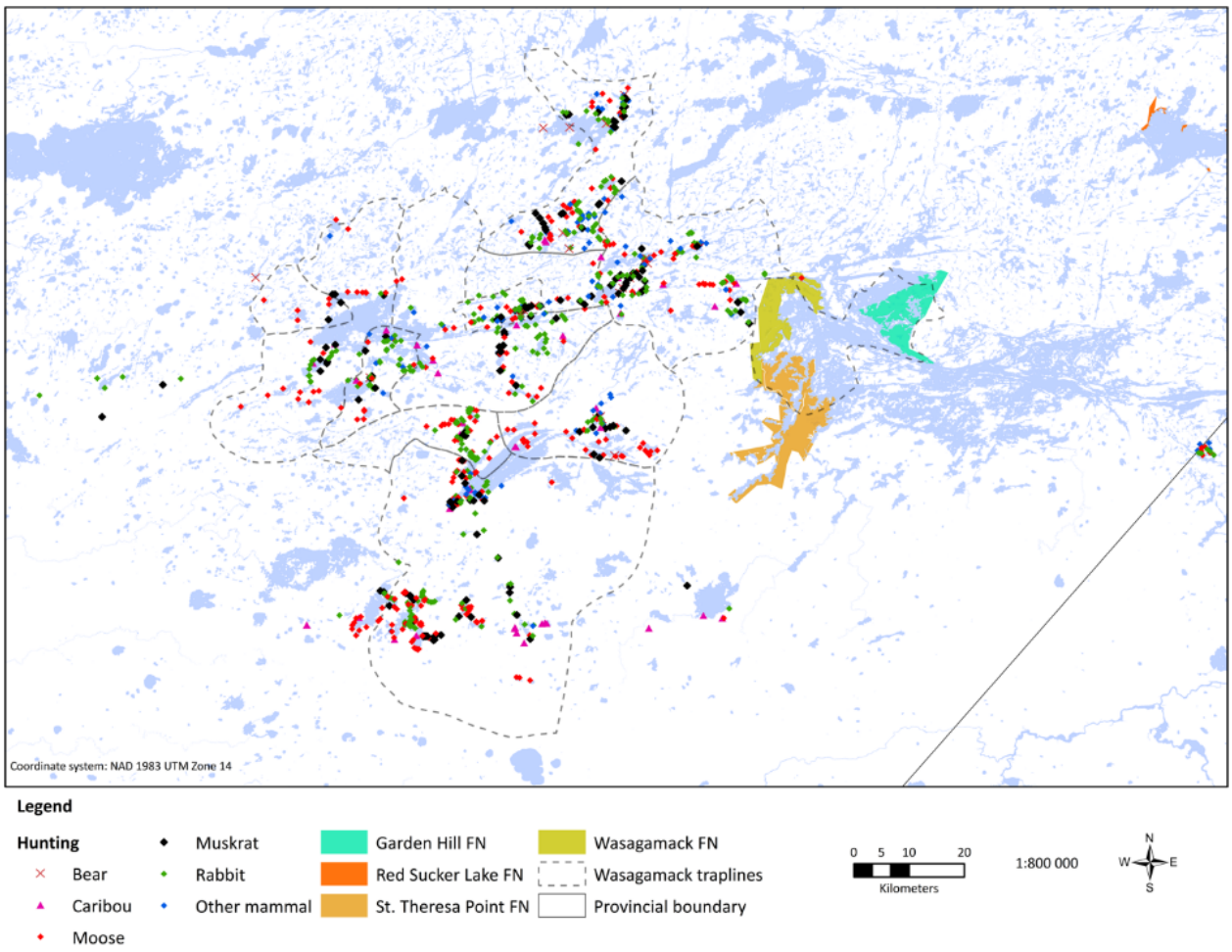
Map A1. Aerial Distances from Wasagamack First Nation for Traditional Land Uses (*N*=49)



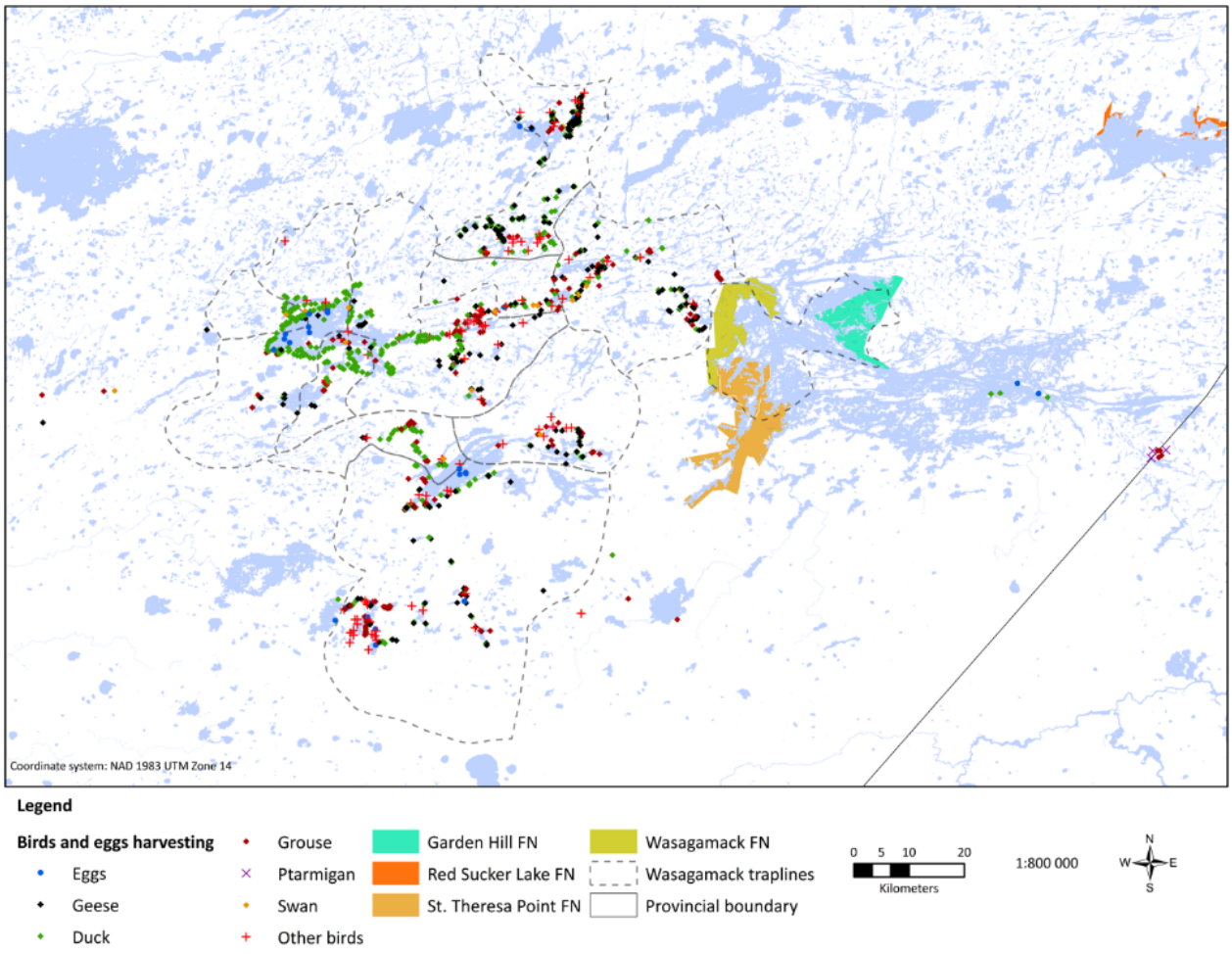
Map A2. Fish Harvest Sites of 49 Wasagamack First Nation Harvesters (*N*=49)



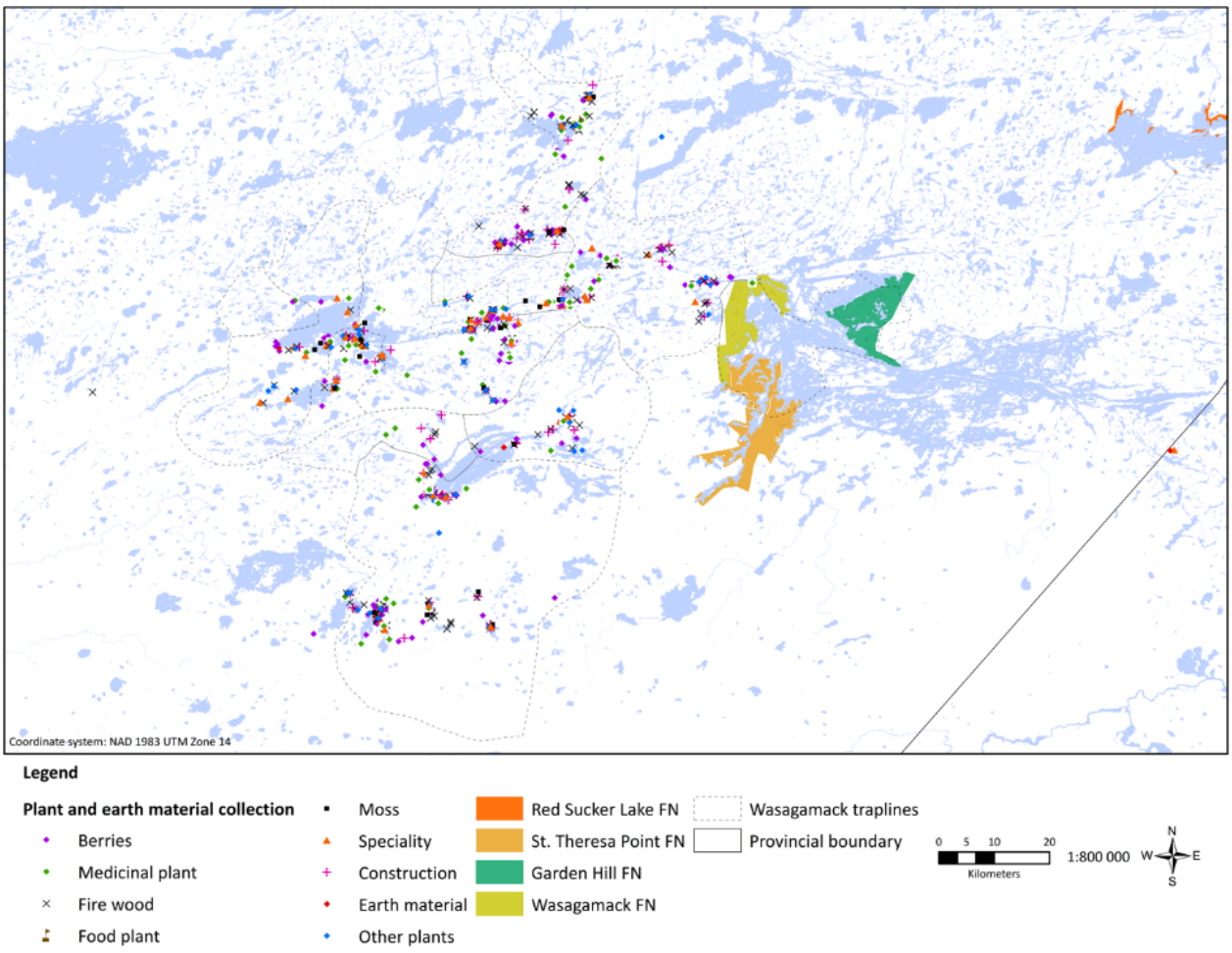
Map A3. Animal Hunt Harvest Sites of Wasagamack Harvesters (*N*=49)



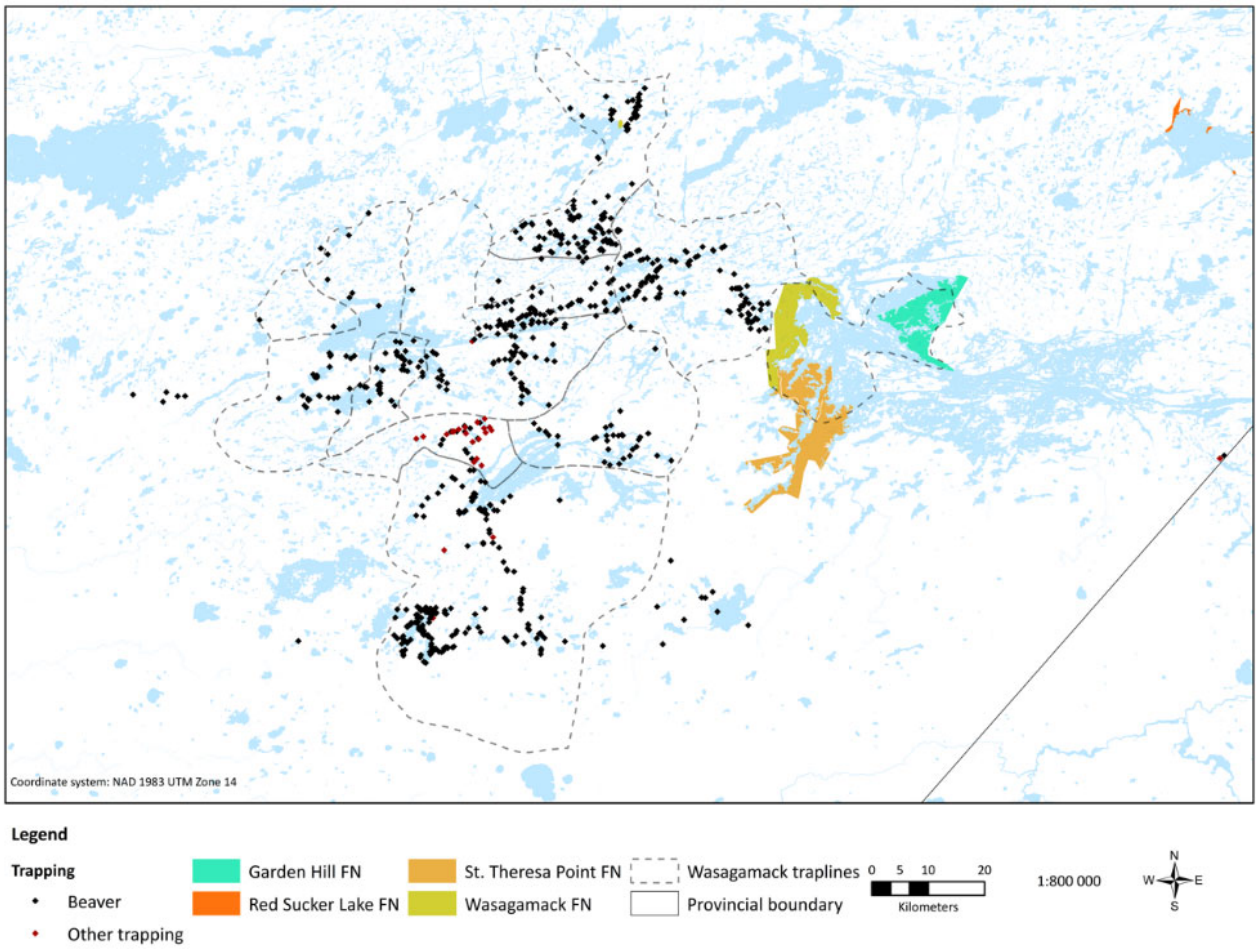
Map A4. Bird and Egg Harvest Sites of Wasagamack Harvesters (*N*=49)



Map A5. Gathering Sites for Plants, Medicines, and Other Materials by Wasagamack Harvesters (*N*=49)



Map A6. Trapping Sites for Wasagamack Harvesters (*N*=49)



Map A7. Foodshed of Wasagamack First Nation Based on Harvesting Sites and Trap Lines for Community-Led Development