PRESCRIBED BURN PROGRAM BEST PRACTICES FOR SOUTHERN MICHIGAN:

FROM INDIGENOUS PARTNERSHIPS TO COMMUNICATION & BURN PLANS

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Client Organization: Southeast Michigan Land Conservancy

EXECUTIVE SUMMARY

THE NEED FOR MORE COLLABORATION AND RESEARCH ON PRESCRIBED BURNING

Prescribed burning is an important tool for managing diverse landscapes to meet site goals. For a land stewardship organization to establish or update a comprehensive burn program, they must respectfully acknowledge and incorporate the long and complex Indigenous history associated with fire, build successful partnerships and community engagement, and employ best available fire science in planning prescribed burns. Gathering and applying all of the relevant information, processes, and protocols can be a major challenge, especially for organizations with limited resources and capacity. Working together with the Southeast Michigan Land Conservancy (SMLC), we address these needs for a broader audience of southern Michigan land stewards. Specifically, we synthesized a variety of sources and perspectives to provide:

1) A deep understanding not just of fire history in Southern Michigan, but also of the culture, rights, knowledges, and histories of the Anishinaabeg in order to build respectful and informed fire reintroduction partnerships.

2) Guidance and recommendations to engage, communicate, and build trust with a variety of stakeholders, partners, and rights holders.

3) Materials and recommendations to develop an effective and informed Burn Plan, best available information on invasive species, and approaches to increase pyrodiversity.

Together, these resources can increase the capacity of any entity to improve or develop their burn program.

UNDERSTANDING ANISHINAABE CULTURES AND THEIR HISTORICAL AND CONTINUED FIRE PRACTICES

To better educate local practitioners on fire ecology and Tribal entities, we reviewed three main fields: 1) the history of fire use within Southern Michigan, 2) Tribal societal structure and dynamics, and 3) the history of Tribes during European settlement. These three areas of focus provide a framework for establishing partnerships with neighboring Indigenous Tribes that is grounded in a deep understanding of cultural fire, Tribal diversity, Traditional knowledge and Tribal sovereignty. By providing an Infographic and Fire Acknowledgement, both informed by our review, we are establishing stepping stones to repair relationships and move towards a more inclusive return of fire to the landscape.

COMMUNICATION AND ENGAGEMENT PLANNING FOR FIRE MANAGERS

To fill the gaps in communication and engagement planning for building a prescribed burn program,

we created the foundation for establishing a robust communication plan. Specifically, we provide guidance on how to increase public support for burning, pathways to build trust for successful partnerships, and strategies to engage with community, pathways to build trust for successful partnerships, and strategies to engage with community, stakeholder, and rightsholder groups to support a fire program. Throughout, we share a variety of tools for communication and engagement, including communication and notification plan checklists, a community survey case study, and an educational StoryMap, all of which will serve SMLC and other fire management agencies to increase prescribed fire acceptance, implementation, and success.

DEVELOPING AN EFFECTIVE AND INFORMED PRESCRIPTION BURN PLAN

To better inform the implementation of prescribed burns, we collaborated with fire practitioners and best available fire science to provide a synthesized Prescription Burn Plan Template and guidance in best burn practices when burning with Species of Concern on site in Southern Michigan. The template is an accessible and innovative planning tool that organizations can customize to small-scale burning and that encapsulates unique features to promote best available fire science and adaptive management. The template also incorporates up-to-date research on incorporating pyrodiversity and burning with animal Species of Concern present. While these resources may be used immediately, we also utilize our entire research throughout the report to provide a guiding framework for land stewardship organizations to move from ad hoc burning to a formalized Burn Program. Our emphasis on moving towards a formalized Burn Program is rooted in the importance of prescribed burning as a long-term, interconnected, and active management tool that is applied on the land in combination with other management strategies for successful restoration and land stewardship.

RECOMENDATIONS

*Based on our research and knowledge to-date, we especially recommend the **following next-steps as priorities** for SMLC, which **could also be adapted to any land stewardship organization** beginning to develop a prescribed burn Initiative or program:*

Phase 1: Building a Foundation

- Establish a deep understanding of Tribal diversity and intersectionality of Tribes, including Tribal dynamics and rights to respect Tribal entities and avoid further exploitation.

- Provide educational materials on Indigenous fire use and history (Infographic) to increase knowledge and understanding within the community.

- Disseminate educational materials on prescribed fire in Southeast Michigan (StoryMap) with SMLC community supporters and partners to increase public awareness and support.

- Identify key stakeholders (such as those suggested in the C&E Guidance Chart) that will support SMLC's burn initiative and complete a partnership plan for each.

- Maintain and expand partnerships with burn contractors and local organizations with resources to help conduct a prescribed burn on fire-dependent SMLC habitat.

Phase 2: Burn with Purpose Rooted in Community

- Reach out to nearby Tribes with the stated interest of forming a mutually beneficial partnership instead of simply requesting needs or project aid.

- As appropriate, participate in community events and cultural activities to better understand Indigenous values and ways of life.

- Use or adapt the Fire Acknowledgement to convey that SMLC accepts accountability in returning fire to landscape, and be prepared to accept and pursue the responsibilities necessary to amend the situation.

- Utilize the trust-building framework (Table 3.2) and tailor to include SMLC-specific actions that will demonstrate the qualities necessary to increase trust between SMLC and tribal partners.

- Provide prescribed fire updates to community members through monthly emails in-between quarterly Newsletters, including information on upcoming planned burns at preserves, opportunities for engagement, success stories, etc.

- Establish long-term relationships with burn contractor or organizational partnership to ensure prescription burning as a long-term and active management tool.

- Use the *Burn Plan Template* and *Species of Concern Chart* to establish Burn Prescriptions and plans for specific nature preserve in order to meet goals outlined in the site management plan.

Phase 3: Develop a Comprehensive Burn Program

- Finalize the terms of collaboration with each Tribal partner and take efforts to protect key sensitive information.

- Establish legal documents that protect Tribal interests (such as Memorandums of Understanding and non-disclosure agreements), and establish rules within partnership documents that allow for flexibility and total changes in agreements

- Host an annual prescribed fire-related engagement activity or event to demonstrate the benefits of burning on SMLC preserves and foster relationship-building with community members.

- Conduct follow-up monitoring and adaptive management on sites using best available fire science review.

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Land Acknowledgement

We want to acknowledge that we have the privilege of living, learning, and working on traditional Anishinaabe land. The University of Michigan originated on and continues to benefit from lands ceded to the federal government in 1817 by the Odawa, Ojibwe, Bodéwadmi, and Wyandot nations under the Treaty at the Foot of the Rapids. As our university stands on lands violently wrested from Indigenous peoples, our research has inherently benefited from their exploitation. This acknowledgement is not intended to take the place of meaningful action, and we hope that these words are but an initial step toward restitution and Indigenous justice.

Disclaimer

The views and opinions expressed in this publication do not necessarily constitute or reflect the views and opinions of the acknowledged individuals or their respective organizations. We do not represent them or their organizations, and they do not necessarily recommend, sponsor, or endorse our work or final products.

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CHAPTER 1: INTRODUCTION TO PRESCRIBED BURNING AND THE SOUTHEAST MICHIGAN LAND CONSERVANACY

INTRODUCTION

Fire is a fundamental ecological force that determines community composition, regulating the presence of local species adapted to fire. Fire-dependent ecosystems are defined as those whose composition, structure, and function change after fire is removed. Historically, fire operated as a widespread and frequent disturbance across landscapes in the Midwest, reducing the density of woody vegetation and recycling nutrients back into the soil (Cohen et al., 2021a). For thousands of years, Indigenous peoples in Michigan used fires to create mosaics of prairies, oak savannas, and wetland-fens among hardwood forests. The controlled and intentional use of fire by Indigenous peoples had a variety of objectives, such as wildlife hunting, vegetation harvesting, pest management, travel and trade, as well as warfare and extortion (Williams, 2005). The Indigenous cultures would not have persisted without the use of prescribed fires (Kimmerer & Lake, 2001), and its widespread use increased understanding of fire effects on wildlife, plants and fungi; the influences of fuel moisture, fire seasonality, frequency and severity; and fire control (Lake et al., 2017). Western academics refer to this collection of this knowledge as Traditional Ecological Knowledge (TEK). However, "TEK" is inseparable from a larger body of knowledge commonly referred to as "Traditional Knowledge" or "Indigenous Knowledge" that consists of social, cultural, philosophical, historical, and spiritual relationships to a Tribe's respective landscape.

Since the arrival of the Europeans, the suppression of fire remained prevalent up to the late 20th century, causing detrimental impacts on fire-dependent ecosystems. The lack of fire allowed plant material to accumulate within forests for centuries, greatly increasing fire severity when wildfires broke out. Furthermore, fire-sensitive species colonized fire-adapted habitats, increasing canopy cover, reducing understory plant diversity, and cooling local soils (Varner et al., 2016). This positive feedback loop of more moist conditions is known as mesophication. Mesophication coincided with the spread of non-native vegetation that was introduced by the Europeans. Non-native or exotic species that are able to outcompete native ones are considered to be invasive, and they degrade native species richness as they displace native plants (Pyšek et al., 2012). The combination of mesophication, exotic invasion, and land use change has reduced fire-dependent prairies, savannas, and barrens in Michigan to just 0.02% of their historical range (Cohen et al., 2021a). This is concerning for the many wildlife species that rely on prairie and oak-savanna habitats. The reintroduction of fire can help address the threats from mesophication and invasive species. Thus, prescribed burning represents

a powerful tool that management can apply to aid in the restoration of prairie and oak-savanna habitat and, potentially, the control of certain invasive species (Cohen et al., 2021a).

For an organization to utilize the ecological benefits of fire, there needs to be an informed and sustainable Prescribed Burn Program with effective stakeholder communication. Controlled studies of burns and effective sharing of burn outcomes among practitioners remain inadequate (Mandle et al., 2011a). As managers continue to learn more about effective practices, the need for meaningful inclusion of TEK in prescribed burn programs is further recognized. While Western Knowledge provides a detailed understanding of ecosystem parts, traditional knowledge reinforces a place-based understanding of ecosystems (Power & Chapin III, 2010). However, one must also recognize that Europeans degraded this knowledge through forced assimilation of Indigenous peoples and forced removal from their homelands. Because of this traumatic history, Indigenous communities are cautious to work with Westerners to avoid further exploitation. Consequently, potential partners must maintain open communication and knowledge with tribes as well as maintain confidentiality of and respect for the sacredness of surviving information (Tribal Adaptation Menu Team, 2019). To inform long-term sustainability and resiliency of fire-dependent ecosystems, it will be key to respectfully acknowledge and incorporate TEK as well as to collaborate with and inform the people and organizations in the areas near burn sites.

Overview of Southeast Michigan Land Conservancy

The Southeast Michigan Land Conservancy (SMLC) is a non-profit organization with the mission of "conserving natural lands and open space - including forests, wetlands, meadows, agricultural lands, and places of scenic beauty - to provide habitat for wildlife and enrich the lives of people" (SMLC, 2022). The organization was founded in 1988 with the original goal of supporting landowners to protect natural lands and open spaces. Since then, SMLC has expanded its goals to include fostering healthy ecosystems, promoting appreciation of the natural environment, and both educating and engaging the community in conservation and land stewardship. SMLC's board of directors governs the organization and its practices, and it oversees seven standing committees, one local chapter, and three dedicated staff that support SMLC in implementing its goals and objectives. Being a non-profit organization, SMLC also relies on funding provided by supporters and partners, many of which are local businesses and foundations. Consequently, building relationships

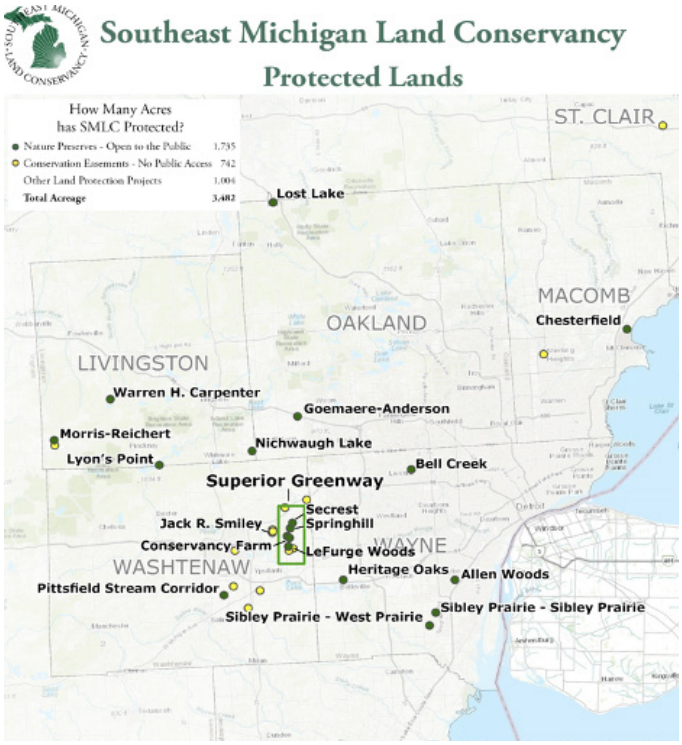

Figure 1.1 *Geographic locations of SMLC protected lands in seven counties of southeast Michigan*

and objectives. Being a non-profit organization, SMLC also relies on funding provided by supporters and partners, many of which are local businesses and foundations. Consequently, building relationships and generating trust with southeast Michigan communities and stakeholders is essential for the sustainability and success of SMLC's programs.

As of March 2022, SMLC owns and manages over 1700 acres of land within the following 7 southeast Michigan counties: Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne. SMLC's land is divided into 18 nature preserves and 15 conservation easements (Figure 1.1). Much of this land is historically fire-dependent

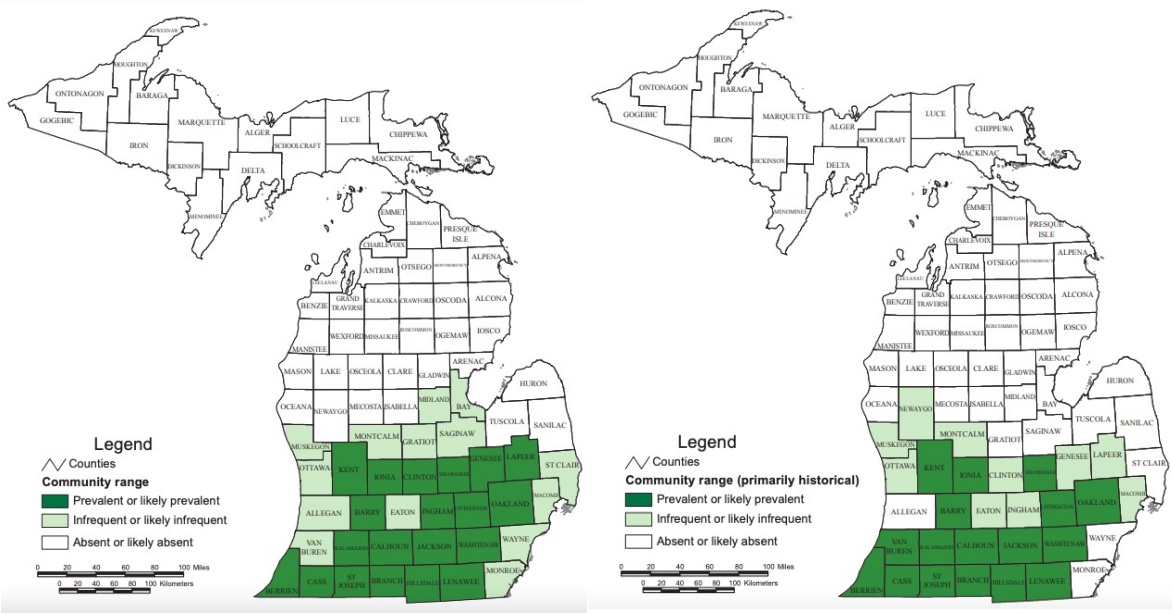

Figure 1.2 *Hypothesized historical (circa 1800) community range of dry-mesic southern forest (left) and oak openings (right) in Michigan (Albert et al., 2008).*

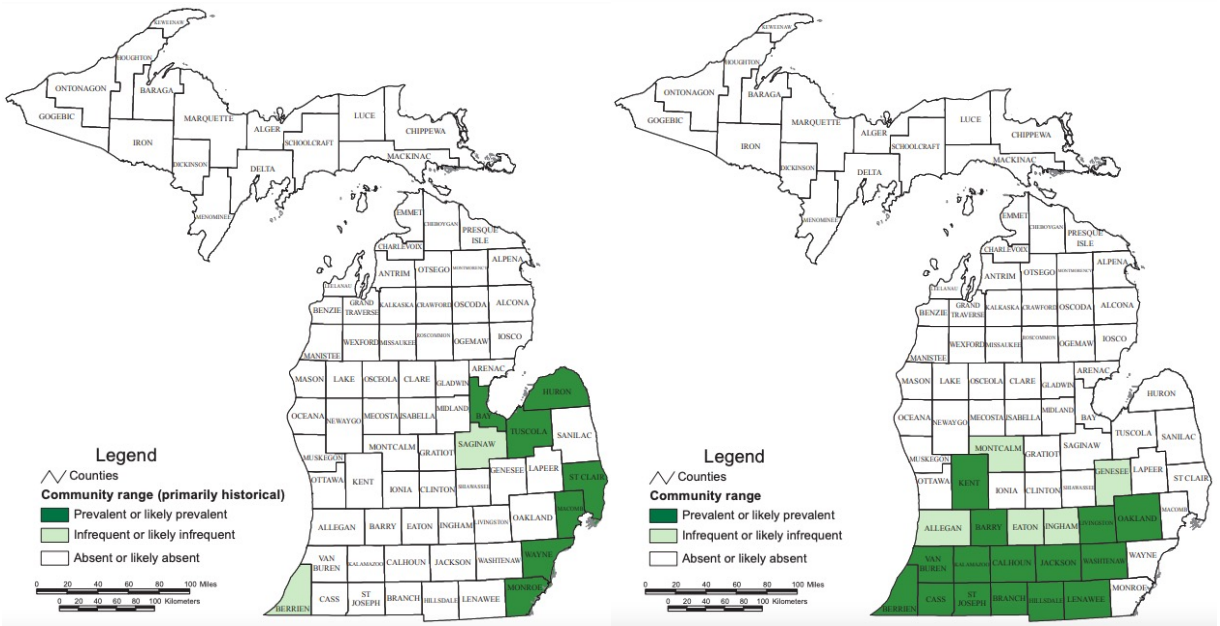

Figure 1.3 *Hypothesized historical (circa 1800) community range of lakeplain wet prairies (left) and prairie-fens (right) in Michigan (Albert et al., 2008).*

habitat including dry-mesic southern forest, oak openings, oak barrens, dry-mesic prairie, and lakeplain wet prairie (Pyke et al., 2010; Figures 1.2 and 1.3). However, remnant prairies and oak savannas are likely to become maple-dominated or invasive-dominated forests with the continued absence of disturbances to remove woody vegetation.

SMLC nature preserves are further split up into tiers of importance, with tier 1 sites being the most managed (maintained trails, public access, stewardship events), tier 2 sites being intermediately managed, and tier 3 sites being the least managed. The tier 1 sites are of highest priority for introducing prescribed fire. Tier 1 sites are the following preserves: LeFurge Woods, Conservancy Farm, Jack R. Smiley, Springhill, Secrest, Morris-Reichert, West Prairie, and Lost Lake (Figure 1.1, Table 1.1). The first five are located within the Superior Greenway (green box in Figure 1.1), which contains 2700 acres of protected land to enhance habitat connectivity. Each preserve has a management plan containing specific information on current property conditions, environmental conditions, threats, and management goals and activities. This includes outlining the objectives for the use of prescribed fire.

In general, the goal of using prescribed fire at SMLC's nature preserves is to foster new, fire-adapted ecosystems as well as maintain existing, fire-adapted ecological communities that are threatened by mesophication, invasive species, and/or forest succession. For early-successional communities, the return of fire is needed to prevent the succession of grasslands and oak-savannas into forests, to aid in the conversion of fallow agricultural fields into native grasslands and to promote the diversity of grasses and forbs. For late-successional communities, fire is needed to restore semi-open canopy conditions within historically dry forests and to promote the regeneration of both oak species and fire-adapted ground/shrub layer diversity. By increasing the range of fire-adapted communities, SMLC will increase the heterogeneity of habitat and enhance biodiversity within southeast Michigan. SMLC will also increase long-term resiliency of these sites and their value and enjoyment to Michiganders.

Despite the increasing rarity of prairies and oak savannas, prescribed fires have been limited at these sites because SMLC lacks a prescribed fire program. So far, fire has been introduced to three of the top tier sites listed in Table 1.1: LeFurge Woods, West Prairie, and Lost Lake. SMLC has initiated a partnership and MOU agreement with The Nature Conservancy (TNC) to have greater capacity to burn at one of their most ecologically important nature preserves, West Prairie. To increase their use of fire as a conservation tool, SMLC must develop a sustainable and appropriate burn initiative that uses a combination of informed knowledge and research to accommodate each site's natural conditions and management goals. In addition, extensive coordination with numerous partners and stakeholders is required for the plan to be widely understood and accepted. SMLC has limited capacity to adequately meet these needs, so it has asked the University of Michigan for assistance. Building the foundation for a prescribed fire initiative will allow SMLC to improve and restore habitat in more of their preserves for fire-adapted species, strengthen relations with their partners, and improve trust, support, and ecological understanding within the community.

Table 1.1 *SMLC Tier 1 Preserves, characterized by fire-dependent habitat, invasive plants of concern, and site conservation significance. Habitat designated as grassland/prairie includes old agricultural fields that can be restored to these habitats in the future. Information gathered from SMLC Management Plan documents.*

PRESERVE	FIRE-DEPENDENT HABITAT	INVASIVE PLANT SPECIES OF CONCERN	CONSERVATION SIGNIFICANCE
LeFurge Woods	Prairie, oak-hickory forest, successional grasslands, and wetland areas	Phragmites, buckthorn, honeysuckle, autumn olive, teasle, shrub-carr	Important natural land within the Huron and Rouge watersheds, helping to ensure the quality and quantity of water resources for the area.
Conservancy Farm	Grassland, dry-mesic southern forest	Non-native Teasel, reed canary grass, buckthorn, Japanese barberry, oriental bittersweet, purple loosestrife, honeysuckle	Diverse habitat for wildlife, especially for grassland-nesting birds, including Henslow's sparrow (state-endangered), and Short-eared Owls (state-endangered).
Jack R. Smiley	Dry-mesic southern forest, prairie, emergent marsh	Phragmites, buckthorn, honeysuckle, autumn olive, non-native teasel, hybrid cat-tails, garlic mustard	During a botanical survey, 87 native plant species were counted and appropriate habitat exists for the State-listed goldenseal.
Springhill	Prairie, dry-mesic southern forest	Autumn olive, buckthorn, reed canary grass, honeysuckle possible garlic mustard	Quality and variety of habitats and overall size may be conducive to supporting rarer species of birds, amphibians and reptiles that do not coexist well with human activity.
Secrest	Dry-mesic southern forest, grassland	Autumn olive, buckthorn, reed canary grass, stiltgrass,	Native forbs and grasses in this habitat are adapted to frequent fires. The oak-dominated areas of high-quality woods are undergoing mesophication and need fire to increase diversity.
Morris-Reichert	Dry-mesic southern forest, grassland, emergent marsh	Phragmites, buckthorn, autumn olive, honeysuckle, oriental bittersweet, hybrid cat-tail, reed-canary grass	Habitat quality and variety may be conducive to supporting rare species including more amphibians and reptiles. Blanding's turtles, a state species of Special Concern, have been sighted.
West Prairie	Lakeplain wet prairie, oak openings, mesic tallgrass prairie	Buckthorn, black alder, oriental bittersweet, phragmites, autumn olive, teasel, purple loosestrife	Presence of populations of federal, state and globally-rare animals in the Oak openings eco-region. Examples include Karner blue butterfly and spotted turtle.
Lost Lake	Dry-mesic southern forest, emergent marsh, prairie fen, southern wet meadow, grassland	Phragmites, black-swallow wort, autumn olive, buckthorn, honeysuckle, multiflora rose, Japanese barberry, purple loosestrife, reed canary grass	Contains a meandering streams, ponds, and wetlands which provide a riparian corridor that travels through the Property to adjacent properties. Restoring open habitat conditions near suitable wetland and adjacent upland habitats would create possible habitat for Massasauga rattlesnakes.

Project Goals and Objectives

We began this project alongside Southeastern Michigan Land Conservancy (SMLC) to specifically apply fire to their own properties, but as they are in the early stages of exploring how burns most beneficially fit into their own work, we tailored our material for the broader implementation across Southeast Michigan for a wide variety of practitioners. The overall goal of our project is to provide best practice recommendations for a holistic, informed, and inclusive Prescribed Fire Program that is informed by scientific literature, practitioner experience, and TEK for the Southeast Michigan Fire practitioner community alongside specific recommendations to SMLC. To achieve this goal we will:

1) Engage the broader fire practice community within Southern Michigan in sharing resources, knowledge, and understanding to synthesize a comprehensive guiding Prescription Burn Plan Template that includes best available fire science information from scientific literature.

2) Develop guidance and resources for a SMLC prescribed fire communication plan based on broader community practice.

3) Provide guidance on how to establish a partnership with Indigenous Tribes that is rooted in a deep understanding in the uses of cultural fire, tribal diversity, traditional knowledges and Tribal sovereignty.

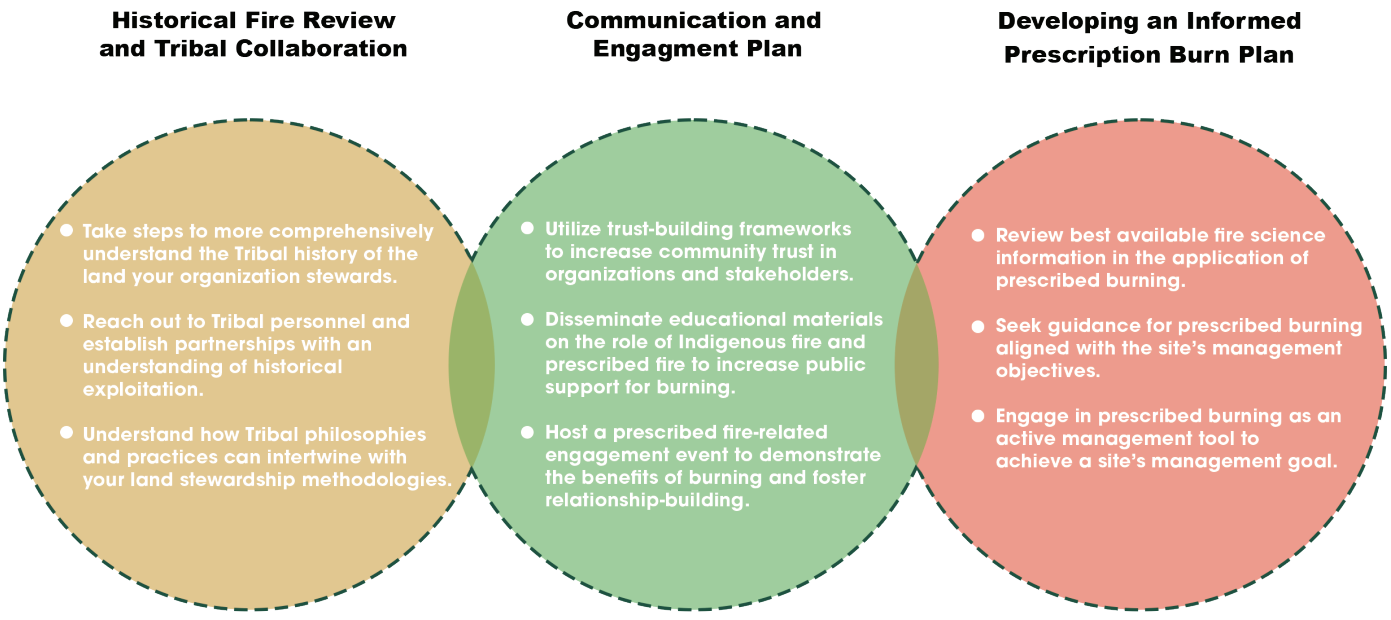

Figure 1.4 *Three project goals*

Approach and Chapter Overview

The four project objectives formed the basis of our research and the three main chapters of this report:

In **Chapter 2**, we help guide Western fire practitioners and researchers to improve their understanding of Indigenous fire practice with a focus on Anishinaabeg history, culture, and social structures, while also highlighting the environmental implications of European settlement. Readers will learn how to cooperate with Tribal partners in a respectful way that recognizes the sensitivity and complications of protecting Traditional Knowledge. This chapter guides practitioners to honor and respect Anishinaabe peoples, cultures, and knowledge as it relates to prescribed burning.

In **Chapter 3**, we provide guidance and recommendations for fire practitioners in community engagement strategies to promote public understanding and support of prescribed burning. This chapter will focus on the importance of developing a communications plan within a burn program, as well as outline with whom and how an organization can engage. We provide recommendations and valuable communication resources and products for Southeast Michigan Land Conservancy (SMLC) that can also serve as a model for other fire practitioners and agencies.

In **Chapter 4**, we provide a background of the fundamental components of a Burn Plan and present a novel and comprehensive Prescription Burn Plan Template that fire practitioners can customize in the planning of future burns on their sites. The Burn Plan Template utilizes best available fire science for land managers who want to revise or incorporate a comprehensive plan for prescribed burning into their sites' land management plans. We also provide relevant guidance on species of concern, invasive species, and approaches to increase pyrodiversity.

Project Significance

Prescribed fire is becoming a widely accepted and often used management technique to stimulate the growth of native species and increase species diversity (McGowan-Stinski et al., 2022). The publication of these documents are a model for other organizations and agencies of how Collaborative Adaptive Management can be applied to meet an important land stewardship need. It provides a network of information that will guide the work of many others practicing prescribed burning, promoting the formation of new partnerships and dissemination of best practices within prescribed burning. Our materials allow stakeholders such as board directors, local fire professionals, volunteers, preserve visitors, and neighbors to engage in meaningful dialogue to promote best fire management practices as a valuable tool for resilient conservation in the face of threats from climate change.

These resources support SMLC's efforts on all aspects of planning and implementing prescribed burns. Currently, SMLC does not have a structured burn program, resulting in the degradation of land or the need to continue conventional agriculture in areas that have the potential for restoration. As many natural fire regimes are suppressed throughout Michigan, it is vital for SMLC to utilize fire management.

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CHAPTER 2: UNDERSTANDING ANISHINAABE CULTURES AND HISTORIES TO BUILD RESPECTFUL AND INFORMED FIRE PRACTICE PARTNERSHIPS

PURPOSE AND AUDIENCE

The use of fire within the landscape has a long Indigenous history. However, neither the history nor the practices are well understood, acknowledged, or accepted by Western researchers and practitioners. Consequently, this chapter aims to guide Western stewards to improve their comprehension of Indigenous fire practice and Anishinaabeg **history, culture,** and **social structures**. Additionally, readers will also learn how to cooperate with Tribal partners in a good way, which includes understanding the sensitivity and complications of protecting Traditional Knowledge. The chapter guides people to honor, respect, and avoid exploitation or appropriation of the Anishinaabe peoples, cultures, and knowledge.

THE HISTORY OF FIRE ON SOUTHERN MICHIGAN LANDSCAPES

For Western society, the need for ecological fires is a relatively new concept that arose in response to increasing wildfire occurrence and intensity, especially in the dense forest areas. On the other hand, various Indigenous peoples on Turtle Island (modern-day North America) have long, beneficial histories with fire. Therefore, to better understand fire-related ecology, we must better comprehend the differences in how Indigenous peoples' and European settlers' respective relationships to fire influenced the landscape. To highlight these differences, we will investigate the history of fire use within modern-day Michigan and other regions of Turtle Island within what is currently called the United States.

Prior to the arrival of European settlers, Indigenous Tribes in the area now called Michigan had already been utilizing fire as both a cultural and ecosystemic management tool for millennia. Cultural burning was integral to increasing biodiversity and habitat diversity because — in areas where Indigenous people frequently applied fire — the fires halted ecological succession by reducing non-fire-dependent woody shrub coverage. The applied fires allowed many early-successional ecosystems, such as oak savannas and prairies, to persist and spread. On the other hand, from the time American settlers took control of Michigan, vegetation density has significantly built up, non-native invasive species have vastly and densely spread, and mesophication has accelerated. Additionally, settler agriculture, urbanization, and industry displaced many fire-dependent ecosystems, such as oak forests. As a result of these factors, Michigan's fire-sensitive areas significantly disappeared. In this section we detail how and why this change in the culture and landscape occurred over time. A summary of some of this content for communication purposes can be found in Appendix A (Infographic: Life From Ashes: Learning From Indigenous Fire Use to Heal Neglected Ecosystems).

Cultural Use of Fire Within Native American Tribes

Pre European Settlement 1500s - 1750s

Many Indigenous peoples have had a deep understanding of fire as an ecological process that encouraged biodiversity and expanded habitats, playing a vital role in many facets of their life and culture. Traditionally, they would conduct repeated, controlled burns throughout a cycle of one to three years (Williams, 2003). To create a mosaic of habitats and cultural resources across the landscape, Tribes would often selectively apply fire by concentrating application in some areas and excluding fire from others (Williams, 2003). Specifically, cultural burns established and promoted landscapes with diverse resources and habitats for hunting, crop production, insect collection, pest management, and improved grazing space for big game, all of which were essential for physical and cultural survival (Kimmer and Lake, 2001). Additionally, this landform mosaic reduced fuel load and limited large-scale, destructive burns, protecting culturally important and medicinal plants.

"Prairie Fire" (Dudash, C. Michael 1952)

Further elaborating on the importance of cultural burning, many Indigenous peoples would burn large swathes of land to divert deer, elk and bison into more easily accessible hunting areas, such as directing prey towards rivers, lakes or gullies. This repetitive fire use would encourage the growth of prairies and meadows, where a variety of large and small game would come to graze (Williams, 2003). In addition to hunting strategies, fire played a pivotal role in the management of crops, specifically yucca, greens, corn, squash and beans. Additionally, when the growing season had come to a close, Indigenous communities often applied fire throughout old or abandoned fields to clear brush for the future introduction of tobacco or corn (Williams, 2003). Another notable fire use of the Indigenous people included pest management of black flies, ticks, mosquitos, acorn weevils and small rodents. Fire also aided in killing mistletoe, which invaded and overtook many oak and mesquite trees (Kimmerer and Lake, 2001). Other aspects of Indigenous life relied on fire use, such as clearing areas for village sites, long-distance communication through smoke signaling, the creation of trade routes and corridors, and tactical warfare (Kimmerer and Lake, 2001).

"The Smoke Signal" (Remington, Frederick 1905)

Because of fire's crucial role in the continuance of many Indigenous societies, Indigenous peoples believe that the Creator gifted fire to empower them to keep the land healthy, clean, and habitable for a diverse selection of ecosystems. Fire is not perceived as a "management" tool — the term "management" implies that the land and fire are owned, contradicting Tribal philosophy — but rather as a partner in keeping the balance between the "good" and "bad" natural forces (Mason et al., 2012). Indigenous members perceive the use of fire as a spiritual relationship, a tool used in the care and upkeep of land (Williams, 2003). The Ojibwe, Odawa, and Bodéwadmi continue to conduct cultural burns on Walpole Island, a First Nation reserve on the northeast side of Lake St. Clair. To this day, Walpole Island is renowned for its significant species diversity with a largely uninterrupted fire practice (Williams, 2003).

The close and long-term relationship between the Indigenous peoples and fire is reflected in the impact burning had on the land. For Tribal communities, fire possessed the most potent source of energy for managing and participating in the natural ecosystem. The Indigenous people were able to craft their use of fire over hundreds of years of study and empirical experimentation. The abundant use of fire resulted in an increased yield of subsistence crops and game, established species and ecosystem richness, and created the ecosystems that came to represent the region. Contemporary ecological management practitioners have much to gain from the relationship between Tribal communities and fire use; a foresight we are able to appreciate in the present time, but an overlooked element to ecosystem health that the early European settlers disregarded.

Early European Settlement Fire Perception and Use

1750s - 1850s

When European settlers first stepped foot within Northern America, they perceived a land seemingly untouched by humans; a "pristine" land, completely wild, unaltered, and filled with ancient ecosystems stretching across the landscape (Kimmerer, 2011). Europeans viewed the Indigenous presence as harmoniously living as part of nature, being too ignorant and superstitious to change the landscape (Berkes, 2012). This perception that Indigenous peoples had minimal impact on the natural environment, or the concept of the "ecologically noble savage," was a misguided and oversimplified myth, which Europeans continued to promote for centuries to come (Raymond, 2007), and which supported a false belief that nature would be better off without human presence (Kimmerer, 2011). Europeans gave little attention to the realistic implications of Native American land stewardship practices and the application of prescribed fires, and mainly those who lived on the Frontier grew to appreciate the use of fire. With immense migration of Europeans, the perspective of objectified, secular land — in which humans were separate from and divinely dominant over nature — quickly shaped the landscape (Kimmerer, 2000), intentionally converting a landscape of heterogeneous ecosystems of forests, prairies, and oak savannas into a structured layout, with clear divisions between land uses and widespread fire suppression (Kimmer and Lake, 2001).

Although European settlers disregarded the importance of traditional fire practice, early European

"Life on the Prairie: The Trappers Defense, Fire Fight Fire" (Tait, Arthur Fitzwilliam 1862)

settler records do provide evidence of Indigenous people's use of fire. For example, written descriptions note that large masses of land were burned and cleared, with only a few charred trees scattering the landscape (Williams, 2003). They also note that forested areas were commonly cleared of brush or dense shrub layers, allowing the viewer to see through and around large tree clusters. This cultural use of fire by Indigenous Tribes starkly contrasted the colonial lifestyle. Settlers eventually utilized fire, but only for livestock and crop-related purposes. At the end of the grazing season, farmers burned the dried-up grazing fields, reducing brush and encouraging new growth (Williams, 2003). With the expansion of animal domestication, farmers needed wooden fences to create enclosures, adding to already heightened logging efforts and increasing fire suppression due to the threat of enclosures being burned. The distinct difference between the Indigenous and settler use of fire can be centered around the Europeans' obsession with maximizing productivity for economic species and establishing uniformity (Kimmer and Lake, 2001). The settlers' use of fire served little purpose in the diversification of resources, more so in the preparation of continually

cultivated cropland. Europeans focused on the idea of maximizing productivity for a singular species (Williams, 2003). Fire posed a *threat* to Europeans, serving as a destructive and hazardous force to colonization efforts, oftentimes burning towns, crop fields and killing livestock (Phillips, 1985). This perceived threat of fire was the start of a new culture of fire suppression.

Indigenous Prejudice and National Fire Suppression Agendas

1850s - Present Time

Until recently, the history of fire use by Indigenous Tribes has been downplayed, leading to a lack of recognition and an overabundance of fire suppression regimes. Prejudice arose from a place of marginalization towards Traditional knowledge and partially from the fragmented nature of evidence (Kimmer and Lake, 2001). Many sources on Indigenous burning included journals and oral tradition, not the quantitative data Western scientists demand. More recently, evidence to support Indigenous information sources has come from data collected from charcoal profiles, archeological studies, dendrochronology (the science and technique of dating events and environmental change through the analysis of annual growth rings in tree trunks), and paleo-ecological data (Trauernicht et al., 2015). Due to the ignorant neglect of Indigenous fire practices, and an apparent lack of evidence of positive ecosystem management brought about by fire, early conservationists and government officials spurred a fire-suppression initiative for the next century to come.

During the late 1800s, the commercial timber industry saw forest fires as a threat to the supply chain and sought protection of forests from fire. Ironically, however, the logging industry's wasteful harvesting methods carelessly left behind many branches and tree litter on the forest floor, and this provided much fuel for large fires, especially after a drought season had dried the litter (Schaetzl, n.d.c). After the Midwest Fires of 1871 killed thousands of people and burned millions of acres throughout the MidWest, conservationists persuaded the U.S. government to establish national forest reservations to protect the diminishing forest resources. (Forest History Society, n.d.). With the establishment of Yellowstone National Park in 1872, the U.S. Army was given responsibility as its safeguard. Early into Yellowstone's history, multiple fires were documented from both human-related causes and natural circumstance. The Army, unable to contain the forest-fires with its provided soldiers, instituted the first fire suppression mandate on federal land (Wagtendonk, 2007). This policy carried over to Sequoia and General Grant National Parks. In 1916, the Army was removed from management, and the National Park Service took oversight (Wagtendonk, 2007), continuing the fire suppression policy.

In response to the fires of 1910, which burned 3 million acres in Montana, Idaho and Washington, the U.S. Forest Service and the National Park Service began efforts to install total fire suppression (Forest History Society, n.d.). The newly instated national fire policy had the goal of rapidly suppressing all fire and preventing new fires, even though many farmers, ranchers and timbermen saw benefit in the use of fire to improve land characteristics (Forest History Society, n.d.). In 1944, the Forest Service popularized Smokey Bear and other furry creatures to encourage

the public to support forest fire prevention, doubling down on fire suppression efforts and promoting policy. However, during the 1960s, opinions on fire suppression began to evolve. George Briggs, the assistant chief ranger at Yosemite, observed a fire in 1964 which burned for three to four days at 9,380ft. This fire burned a mere 0.1 acres and with this discovery, Briggs recommended that all fires above 8,000ft not be suppressed if naturally contained by fuel breaks (Wagtendonk, 2007).

Another Enemy to Conquer. Forest fires. 9 out of 10 Can Be Prevented" (Staehle, Albert 1944)

In 1968, the National Park Service finally recognized the role of fire as an ecological process. In turn, this allowed fires to burn from natural causes in designated fire management areas (Forest History Society, n.d.). Over the next couple of decades, with variations in fire intensity and size, fire management plans were forced to adapt, incorporating fire as an ecological process in managing forest ecosystems. To this day we see fluctuations in fire policy, dependent on concerns about air quality, habitat fragmentation, fuel accumulation, and adjacent developments (Wagtendonk, 2007).

Mesophication and The Current Effects Of Fire Suppression

With nearly two centuries of fire suppression throughout the 19th and 20th centuries, the current ecosystem structures throughout the Midwest and Southern Michigan have undergone rapid transformation. Fire, along with wind and herbivory, are central elements of disturbance affecting forest composition. The historical use of fire by Indigenous Tribes resulted in low to moderate severity disturbances. These semi-frequent burns would kill small species, or even the entirety of the forest understory, leaving the substantial legacy of mature trees intact, but opening the overstory which allowed for the establishment of early successional and shade-intolerant species (Frelich, 2002). Contrastingly, fire suppression resulted in woody encroachment into prairies and increased canopy coverage and changes in tree species composition in forests, evident as a reduction in fire-dependent oak savannas, open oak forests, and prairie ecosystems throughout Southern Michigan with the introduction of American settlement around 1850 (Figure 2.1).

The consequences of fire suppression further set up a positive feedback loop of mesophication, which reinforces the loss of fire-dependent ecosystems and increases invasive species (Nowacki & Abrams, 2008). Increasing shade and moisture levels within the forest understory suppress shade-intolerant oak growth and facilitate advancement of fire intolerant species (Cohen et al., 2021). Furthermore, the fuel that would have promoted fires decreases as the dense woody layer stifles the establishment of grasses and oak leaf litter. These fuels are critical not only for promoting ground fires, but also releasing

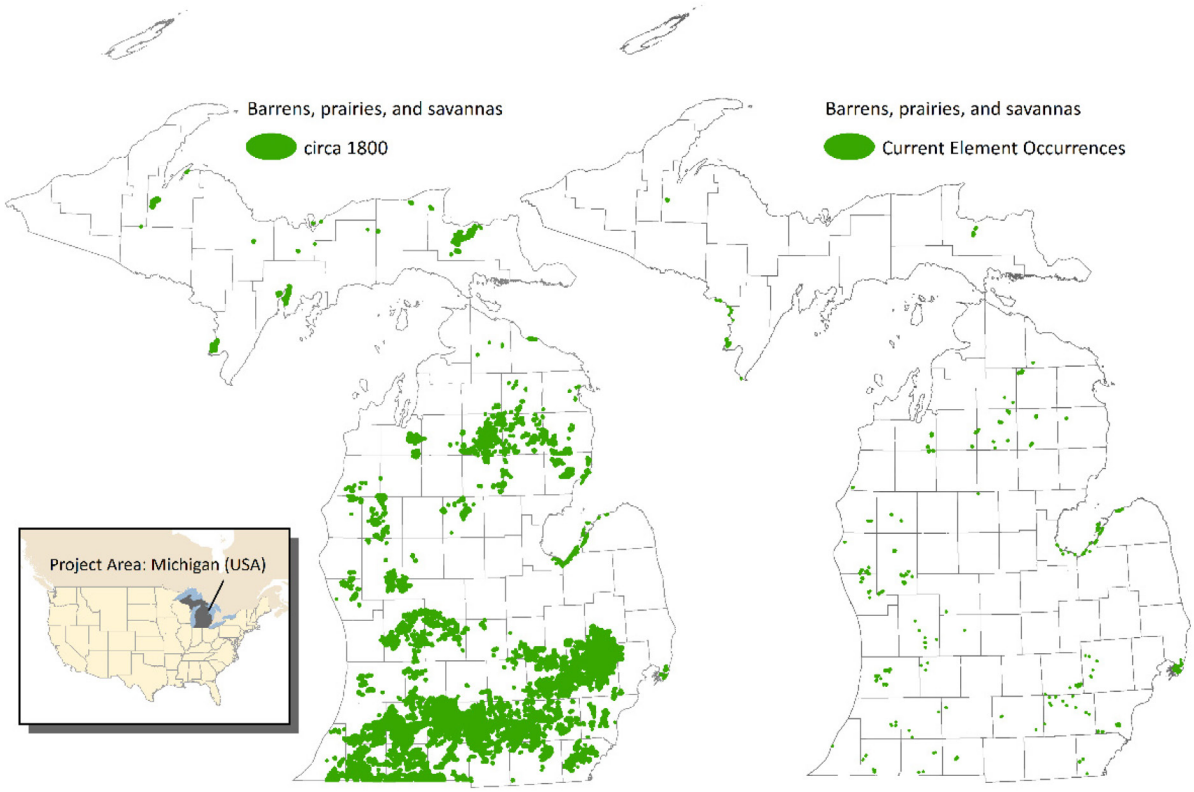


Figure 2.1. Total *prairie, savanna, and oak barren coverage in Michigan. The left represents 1800s coverage, and the right represents current conditions.* (Adapted from Cohen et al., 2021).

nutrients and that facilitate seedling establishment and germination of fire tolerant species (Cohen et al., 2021). The result of mesophication is an overall loss of native biodiversity within closed-canopy systems and across the landscape as forest type becomes more homogeneous (Lettow et al., 2014).

Returning Controlled Burning to Southern Michigan

As the impacts of fire suppression and the need for the reintroduction of fire on the landscape were recognized, Western practitioners began "prescribed" or intentional burns. New initiatives have been established to support these efforts, such as the Michigan Prescribed Fire Council (MPFC), created in 1999. Mark Sargent, of the Michigan Department of Natural Resources (DNR), was the first appointed chairperson in February of 2000, alongside Jim Bruce of the Calhoun Conservation District, the first vice-chair (Michigan Prescribed Fire Council, n.d.). The MPFC aids in providing educational resources in conducting the safe and effective use of prescribed burns, while promoting understanding for the general public. In 2021, the DNR's Forest Resources Division and Fire Management Section conducted 57 prescribed burns throughout Michigan covering 5,100 acres. Over the past twenty years the public understanding of prescribed fire has grown, and yet despite its current recognition, many are hesitant (See also Chapter 3: Communication Planning for Fire Managers). Abundant smoke, seemingly out-of-control flames and the charred remains have tainted some people's perspective on controlled

burns (McCaffrey, 2006). Organizations such as MPFC and the DNR have made a significant effort in drafting educational materials to reinforce the positive outcomes of fire to counter the long history of fire suppression culture noted above.

It is important within the history of fire in Michigan landscapes to note a key distinction between cultural burning and prescribed burns. For Native Americans, the Creator gave them the gift of fire to help maintain balance of destruction and rebirth within their landscapes, and fire became an accepted and prevalent part of Indigenous societies. Additionally, Traditional, cultural burning allowed for the increase and cultivation of cultural resources and subsistence uses (Kimmer, 2000). In contrast, when Western contemporary practitioners conduct prescribed or controlled burning practices, they prioritize the restoration and preservation of ecosystems or certain species, without a focus on pre-settlement cultural values, such as fire-dependent foods (acorns or wildlife) or other outcomes of social importance. To create a more holistic burn program, Western practitioners could consider how to use prescribed burns to fulfill social goals to promote local acceptance. In cultural burning, fire use is intertwined with a locality, and not prescribed by others.

In this section we have reviewed the history of fire use and suppression on Michigan landscapes and the consequences of this history, but that alone is not sufficient for moving forward in the reintroduction of fire practices. Current-day ecological management practitioners have much to gain from the relationship between Tribal communities and fire use. This is a foresight we are able to appreciate in the present time, but an overlooked element to ecosystem health that the early European settlers disregarded. There is a need now to seek respectful and informed partnerships that are not based on the history of exploitation or ignorance. Doing that requires not only an understanding of fire history and how cultural and prescribed burning practices differ, but also knowledge and appreciation of the following, which we will cover in the next sections:

1) **Tribal Societal Structures**
2) **Traditional Knowledges**
3) **Tribal Sovereignty and Rights**
4) **Indigenous-Colonial History**

Brady Highway, a member of the Peter Ballantyne Cree Nation in Saskatchewan, Canada, assists on a prescribed burn in 2012. | Shanon Bond/Parks Canada

STRUCTURE OF ANISHINAABE SOCIETY

Although this chapter specifically focuses on the Tribes within Mshigmé (modern-day Michigan), fire practitioners outside of the state may apply the overall themes to better understand the Indigenous Tribes within their respective regions.

When forming relationships with Tribes, one must understand whom one is addressing. Although Tribes within Michigan share similar histories, each is distinct from one another, with additional diversity within each Tribe. Collective knowledges and perspectives vary across each of the levels. Also, by virtue of the holistic nature of Traditional Knowledges, the Intersectionality of different levels will influence the knowledge, perspectives, and beliefs an individual knowledge holder espouses. Therefore, by understanding the diversity of Tribes — including the meaning of Nations, Tribes, and Clans — those who reach out can better display respect and appreciation for the Tribe as well as limit the overrepresentation of a distinct entity when gathering and interpreting Indigenous knowledges.

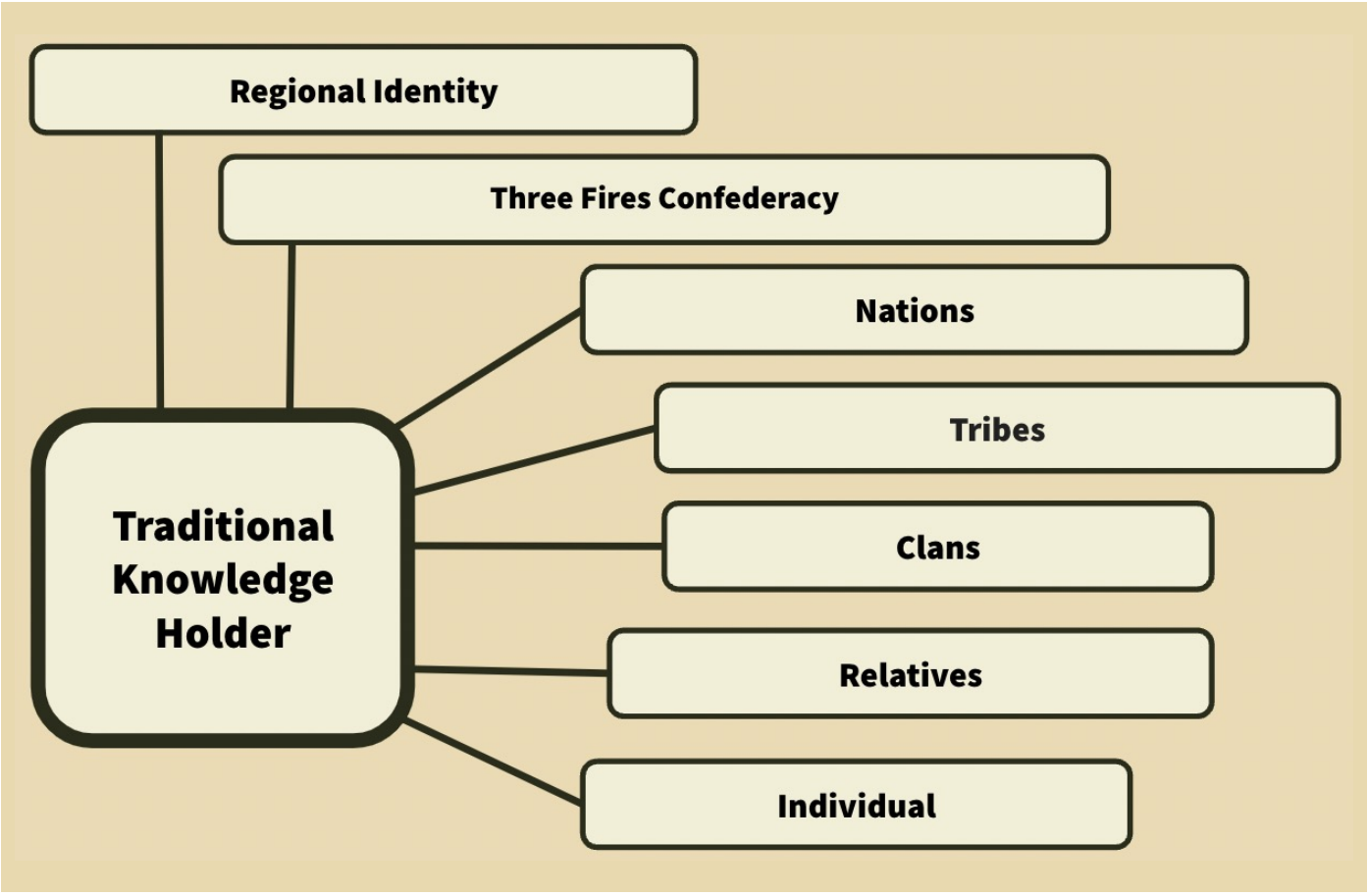


Figure 2.2. *An example of Anishinaabe intersectionality showing the relationships an individual knowledge holder can have to different identities. Each individual knowledge holder may weigh the influence of each differently as well as feel more closely aligned with one level than another | Vincent Salgado*

Regional Identity

The Anishinaabeg are an overarching identity group within Michigan and the Great Lakes. The term "Anishinaabe" refers to the collective of different nations that share a common language (called Anishinaabemowin) and culture. *For clarity, "Anishinaabe" can refer to a single entity of said ancestry or other relation, and "Anishinaabeg" refers to a plurality of Anishinaabe individuals.* The Anishinaabe community mainly includes the Ojibwe (which contains the Chippewa and Salteaux), the Odawa, the Bodéwadmi, the Algonquin, the Nipissing, and the Mississauga (Hele, 2022). It is common to mistake "Anishinaabe" as being limited to the Ojibwe; although all Ojibwe are Anishinaabe, not all Anishinaabeg are Ojibwe. Additionally, some nations, such as the Algonquin Nation, are divided on whether to classify themselves as Ansihinaabe or as a separate, distinct identity (K. Whyte, personal communication, November 11, 2022).

Each nation has its dialect of the Anishinaabemowin language, so each varies in vocabulary; different Tribes can pronounce similar words quite differently. For example, the Ojibwe refer to fire as "ishkode" (ihsh-koh-deh), yet many Bodéwadmi refer to fire as "shkodé" (schkoh-deh) or "shkwedé" (scqui-deh). Traditional Anishinaabemowin originally was an oral language, but different nations have invented varying writing systems that further distanced the dialects and word pronunciations. For example, the Bodéwadmi refer to wild rice (Genus: *Zizania)*, a significant Anishinaabe cultural food, as "mnomen" (muh-noh-min), yet the Ojibwe popularly use "manoomin" (muh-noo-min). Both language and culture vary across each nation, but the Michigan Tribes are part of relatively similar nations of the Three Fires Council (or Confederacy).

Figure 2.3. *Campfire displaying the Anishinaabeg nations + the 12 Federally Recognized Tribes that are present in Michigan: 6 Ojibwe (Center), 2 Odawa (Left), 4 Bodéwadmi (Right) | Vincent Salgado*

Nations

The Three Fires Council (Niswi-mishkodewinan in Ojibwe) is a confederation between the Ojibwe (aka Chippewa), Odawa (aka Ottawa), and Bodéwadmi (aka Potawatomi) nations that share a key geographic origin and history. All three Nations are descended from a people who migrated from the Atlantic after Seven prophets, as told in their migration story, warned them of the eventual arrival of "light-skins" who would encourage them to abandon their teachings and destroy their way of life (Benton-Banaie, 1988). The Third Prophet guided these first peoples to seek the place where "the food grows on water," and they settled in Michigan after encountering the wild rice (Manoomin). After reaching the Straits of Mackinac (Michilimackinac), the migration party split into three Tribes, each bearing different responsibilities. The Ojibwe became the Keepers of the Medicine and the Faith who preserved traditional information. The Odawa became the Keepers of the Trade who led large-scale trading and hunting as well as guarded trade networks. The Bodéwadmi became the Keepers of the Fire who protected the foundational culture and helped guide the confederation into the future (CPN Cultural Heritage Center, n.d.b). When addressing all three nations at once, it is imperative to address them in the order of "Ojibwe, Odawa, and Bodéwadmi" to honor the Three Fire Council's designation of the Ojibwe as the Eldest brother, the Odawa as the Middle brother, and the Bodéwadmi as the Youngest brother (Nottawaseppi Huron Band of the Potawatomi, 2022). Nations further divide into entities the Anishinaabeg consider independent "Tribes" or "Bands."

Indigenous Sovereignty is Recognized Not Granted

It is important to understand that Indigenous sovereignty is recognized, NOT granted, by the Federal government of the United States. Perceiving their sovereignty as being granted reinforces the mindset that the United States is the ultimate, rightful authority of this land, reducing Indigenous autonomy. The current criteria for recognition are very stringent, such as requiring petitioning Tribes to show that they have a non-interrupted history or identity, have maintained a distinct community since historical times, and have retained authority over the collective "as an autonomous entity" (Davis, 2013). Several Michigan Tribes have petitioned to be rightfully recognized, but the Federal government has either denied this right or continued to delay consideration (Wayback Machine, 2013).

In February of 2023, the Department of Interior refused to recognize the Grand River Bands of Ottawa Indians, a state recognized Tribe in Michigan, as the DOI asserted that the GRBOI "did not demonstrate that a majority of its tribe is comprised of a distinct community that has existed from historical times until the present" (Oberle, 2023). The DOI did acknowledge that several independent groups that backed the petition for the GRBOI were actual descendants of the area's historical Odawa bands, but they were not distinct because they allowed other Bands of Odawa from different regions of Michigan to join under the same name (Proposed Finding Against Federal Acknowledgment of the Grand River Bands of Ottawa Indians, 2023). The GRBOI has until the end of August 2023 to appeal and attempt to overturn the decision.

Tribes

Individual Tribes hold similar status as sovereign entities that have jurisdiction to govern themselves and their territories. For example, unlike the American Federal system, Tribes are not inherently required to serve the greater "Nation" after recognition — collaboration is voluntary — and the "Nation" does have legal ownership of the Tribes' lands. Currently, there are 12 federally recognized Tribes within Michigan, with five being in the Upper Peninsula, three in the Northwest Region, two in the Southwest

Region, and one in the West and East Central Regions (Michigan Economic Development Corporation, n.d.). There are currently no recognized Tribes in the territory ceded in the 1807 Treaty of Detroit. Each Tribe has its own Tribal government that can form its own rules, regulations, and methods for enforcement independent of the Federal government (Hickok, n.d.) — controversially, enforcing judicial punishment only applies to Tribal citizens.

Regarding Traditional Knowledge (see below), each Tribe has different sets of laws and protocols for working with non-Tribal entities and releasing information, which may even further vary across departments. Furthermore, the varying local environments across different Tribes influence a diverging development of Traditional Knowledge since different environments prioritize different practices. In addition, every Tribe has different values and local needs that should be considered in building reciprocal relationships. Conclusively, approaching each Tribe will likely result in different collaboration processes, such as having different protocols to co-construct a research study and gather, analyze, and publish information.

Clans

Clans (Dodems; Doh-dehm) are managerial subunits of closely related families that specialize in providing a societal need, such as protection, healing, or food (Goddard and North, n.d.). Clan presence spans and varies across different Tribes. The Creator created clans to help guide the Anishinaabeg and provide structural order to ensure the Anishinaabeg could fulfill their basic needs and not collapse (Goddard and North, n.d.). Originally, there were only seven main clans — Crane, Loon, Bear, Fish, Marten, Deer, and Bird (Folster, n.d.). Other narratives, however, assert that there were five original clans, excluding deer and bird (Fixico, 1994). Either way, other clans descended from these original clans or were adopted from other Nations — i.e. the wolf clan was adopted through the inter-marriage of a Dakota man and an Ojibwe woman — as the Three Fires Confederacy expanded (Folster, n.d.). Therefore, the presence of each clan varies across each Tribe.

The Creator chose each clan animal after considering how their behavior and strengths could best fulfill a role. For example, the deer clan is responsible for caring for the community's social health, and the deer lead this clan because they are predominately kind and gentle (Folster, n.d.). Some clans may have additional responsibilities gained from practicing their original purpose. For example, the bear clan, who was in charge of protecting the people, became familiar with medicinal plants as they often encountered these

What Does "Tribe" Mean and How Should it be Understood?

"Tribe" historically referred to a group of shared language, beliefs, and heritage, making it synonymous with the already mentioned version of "nation." Additionally, "Bands" were historically deemed to be smaller groups of people within the "Tribe" who lived and traveled together (Edutas 2019). However, many people began to refer to "Tribes" as "Nations" to distance themselves from the word's associated stigma of primitiveness. With this transition, "Tribe," "Band," and "Community" began to be used interchangeably to address sub-entities of an Indigenous "Nation"; this is similar to how the American "States" are sub-entities of the Federal government. However, some people do use "Tribe" to address both levels, and others use "Tribal Nation" or "First Nation" to address the sub-entity (Gadacz 2022). To limit confusion, keep in mind that these titles are not settled, and they do vary across different entities. For the remainder of this report, the sub-entity will be addressed as the more recent version of "Tribe."

plants during their patrols (Goddard and North, n.d.). Appendix B (Clan Diversity in Anishinaabe society) further details the purposes of some specific clans, their natural justification, and their affiliation to other clans. To help fulfill their purpose, people within a clan, viewing the clan animals as elders, will seek guidance by observing the behavior of their specific clan animal (Pierotti and Wildcat, 2000). Because of this special relationship between clan members and their respective animals, they consider one's clan animal to be one's next of kin (like a cousin), and individuals were required to promote and nurture their spiritual relationships with their clan animal (Simpson, 2008). Therefore, it is taboo to harm, harvest, or consume one's clan animal (Reo and Whyte, 2012). The Anishinaabeg also address the clans as individuals, reinforcing their personhood. For example, when inquiring about someone's clan, the Bodéwadmi ask, "WHO is your clan?" (Wénithë o gdodém; Weh-knee-juh oh gdoh-dehm), not "WHAT is your clan?".

Since historically all the Clans recognized they were dependent on one another to maintain all the needs of the Tribe, the Tribes deemed all clans as having equal importance. Therefore, they equally treated all clans under the law and consensus decision-making (Goddard and North, n.d.). Chiefs only had authority over their own clan, and Tribes only formed Tribal Councils, which included representatives of all clans, to consider the most serious decisions, such as declaring war (Sen et al., n.d.). Additionally, each clan served as a political collective across Tribes, as members of a clan from different Tribes and nations would occasionally meet to discuss their responsibilities, share knowledge, and rekindle their relationship with the respective clan animal (Simpson, 2008). Because of each clan's importance, when Tribes signed treaties with European powers, each Clan leader drew a pictograph of their clans rather than write their names (Figure 2.4). But, the forced displacement and epistemicide has reduced the clan system, but many Tribes are reclaiming clan systems and applying associated knowledge in a modern context (Pokagon Band of the Potawatomi, n.d).

The original clans. Original 5 include crane, loon, fish, bear, and marten. The original 7 add bird and deer.| Vincent Salgado

Some additional clans. The ones shown include catfish, sturgeon, turtle, beaver, wolf, otter, lynx, butterfly, goose, and eagle.| Vincent Salgado

Applying an Understanding of Tribal Diversity to Outreach

Researchers and practitioners who reach out to Indigenous peoples should not expect to use the same approaches given the great variation and different organizational levels. Across the same Clan in different Nations or even Tribes, regional/local differences will still influence each Clan's knowledge, practices, perspectives, or needs. Additionally, different family histories will influence knowledge and perspectives within a clan of the same Tribe. For these reasons, it is highly important to recognize that the input given from one group of people is not representative of the larger group - Clan, Tribe, or Nation - and in order to gain a more holistic and accurate understanding of the diversity of Indigenous knowledge holders and perspectives. After understanding the relations between the different levels and peoples, outreachers can better understand and appreciate Anishinaabe society, which is essential to developing relationships. The next step is to gain a better understanding of the meaning of Tribal Sovereignty and Rights, and what it means to be a rightsholder and not just a stakeholder, in order to build meaningful and respectful relationships with Tribal partners.

TRIBAL SOVEREIGNTY AND RIGHTS

This section aims to provide key principles for reaching out to Tribal academics and practitioners. Practitioners will better understand how Tribal entities relate to those of Western Institutions and recognize Indigenous peoples as "rights holders." This includes having a clear understanding of an essential framework for initiating collaborations that is commonly known as Free, Prior, Informed Consent (FPIC) and cautions to avoid when reaching out.

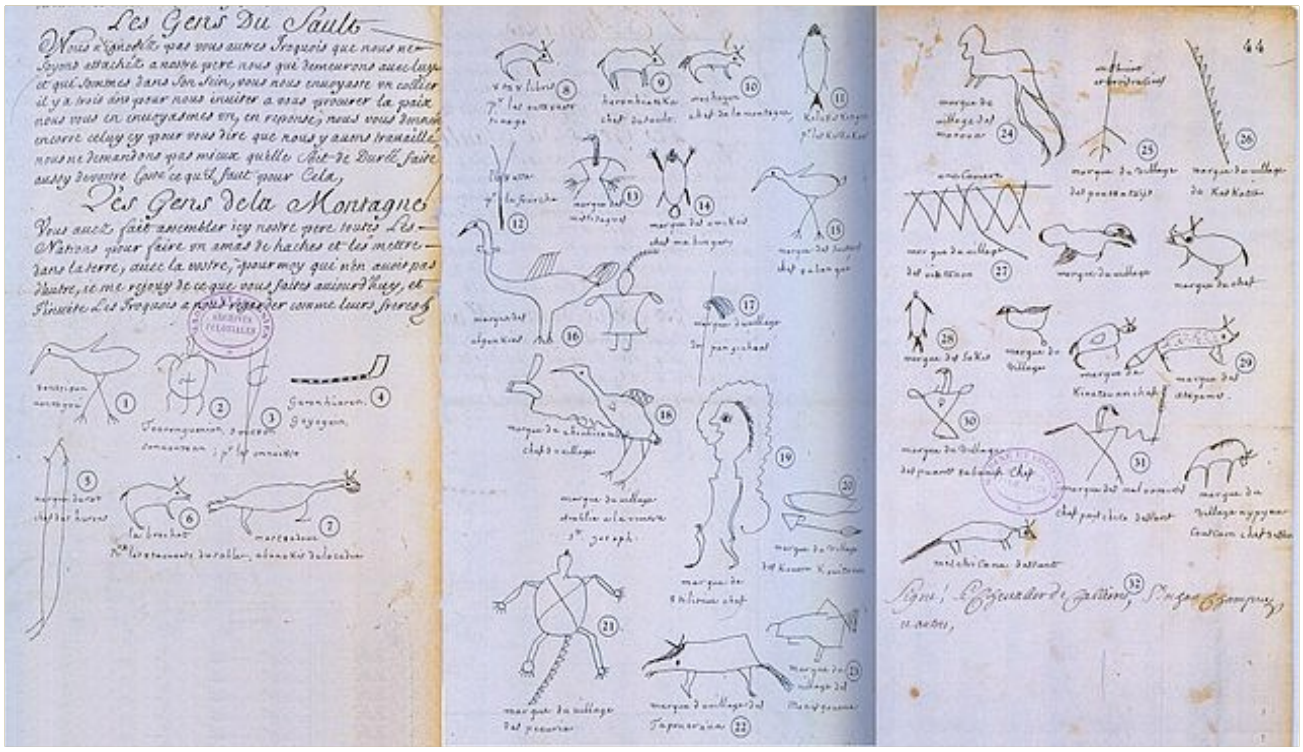


Figure 2.4. *Anishinaabe Clan signatures on the Treaty of Montréal (1701) (Jaenen and McIntosh, 2019).*

Inherent Sovereignty

Despite the American Federation continuing to exert colonial, paternalistic control over the Tribal Nations and their lands (i.e. Congressional plenary power), these "domestic dependent nations" and their respective peoples retain the inherent right to remain a fully sovereign people. Because Indigenous Nations existed prior to the arrival of the Europeans and the formation of the American Colonies and later the Republic, the existence of Indigenous Nations is independent of the existence of the United States. This right to existence is reinforced by the fact that Tribal Nations — as detailed in the history section below — engaged in diplomacy, trade, and warfare with European governments and other Tribal Nations without the approval of the United States prior to and during the American Conquest. Additionally, the international principle of self-determination solidifies Indigenous sovereignty because the Indigenous peoples retained and practiced self-governance regardless of whichever European Monarchy claimed them as part of the Empire (Whyte et al., 2017). Throughout Colonial conquest, the Indigenous nations did not consent to ceding either their autonomies or cultural heritages.

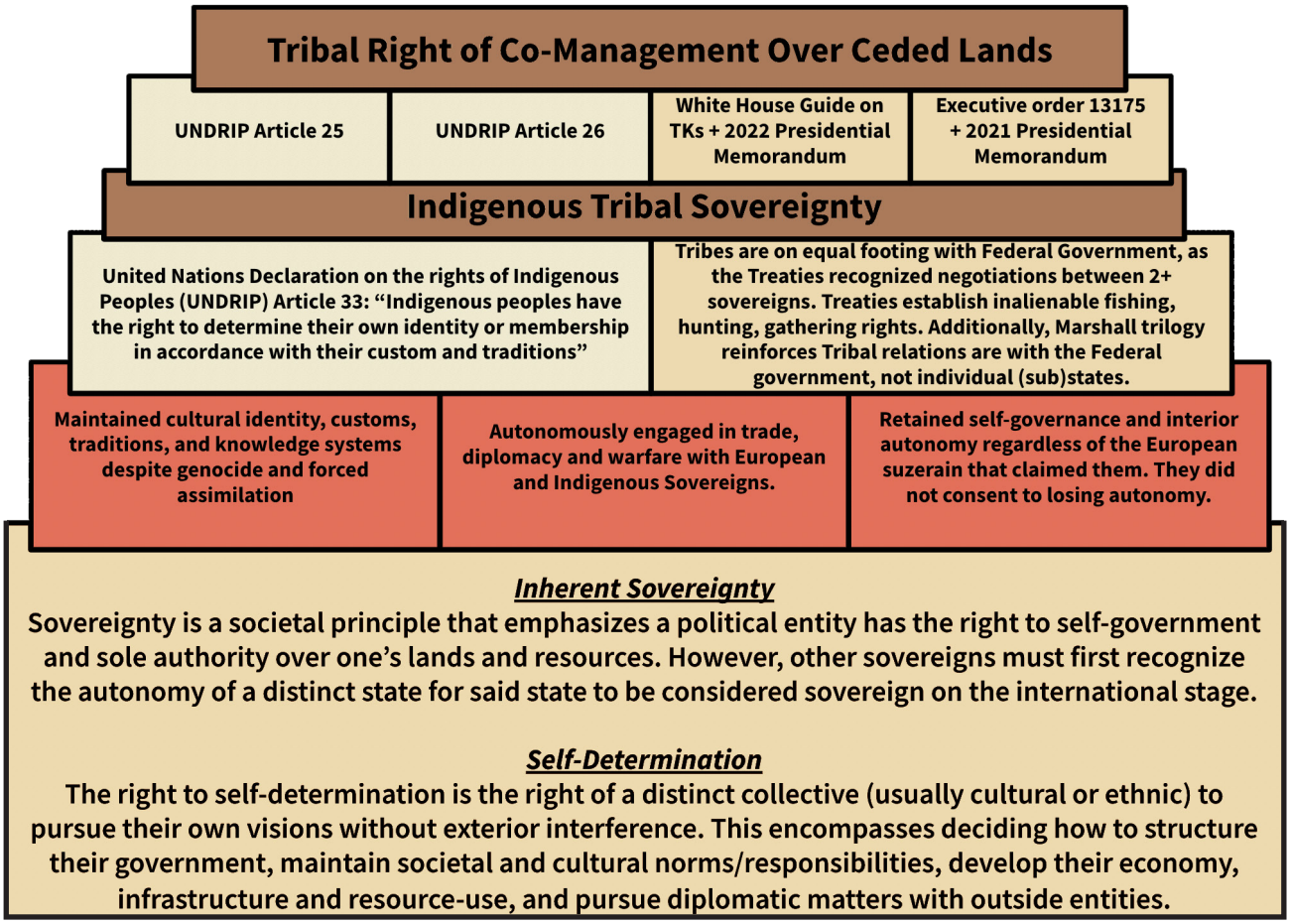


Figure 2.5. *Pyramid of Tribal-Colonial Relations in Conservation. Salmon refers to actions Tribes have taken, tan refers to actions that the sovereign United States has taken, and cream refers to actions that the United Nations has taken. | Vincent Salgado*

Similarly, Article 33 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) — a resolution that the US declared aspirational — asserts that "Indigenous peoples have the right to determine their own identity or membership in accordance with their customs and traditions…" (United Nations (General Assembly) 2007, pg 24), reinforcing the principle of self-determination. Despite facing genocide, expulsion, forced assimilation by the American government and people, many Indigenous Peoples have maintained their customs, traditions, and knowledge systems, and they have the right to assert their independence as distinct peoples. Accordingly, Tribal governments and personnel primarily serve to fulfill and promote the interests and needs of their respective peoples, and they are not obligated to consider the priorities or concerns of the larger American-settler society (Whyte, 2018).

Nation-to-Nation Relations

Because of their inherent sovereignty, Tribal nations, regardless of UN recognition, are of equal footing to other Nations, not to American (sub)states. Additionally, the fact that the US Government, not individual (sub)states, signed land treaties with Indigenous Tribes cements that Indigenous Nations are on equal footing with the Federal Government. Expanding upon this, Intertribal Councils and other coalitions between different Tribal Nations (i.e. Great Lakes Indian Fish and Wildlife Commission (GLIFWC)) are of equal prestige to Intergovernmental Organizations — such as OPEC, Interpol, or NATO — and not to State agencies or Nonprofit Organizations. Executive order 13175 grounds this notion as it defines Tribal officials — who are on par to Federal officials — as "elected or duly appointed officials of Indian tribal governments or authorized intertribal organizations" (Exec. Order No.13175 2000, §1d).

In 2021, the Presidential *Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships* elaborated the Executive order 13175 by asserting it "charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with Tribal officials in the development of [these types of] Federal policies" (Biden, 2021). More specifically, when federal agencies propose a policy that has "substantial direct effect [either] on…Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes" (Exec. Order No.13175 2000, §1a), these Federal agencies are required to "consult with Tribal officials as to the need for Federal standards and any alternatives that would limit the scope of Federal standards and any alternatives that would limit the scope of Federal standards or otherwise presence the prerogatives and authority of Indian tribes" (Exec. Order No.13175 2000, §3c3). As a result, Tribal agencies and their officials are equal in prestige to the Federal agencies and personnel of the American Federal Government.

In 2022, the Presidential *Memorandum on Uniform Standards for Tribal Consultation* details next steps for consulting, first emphasizing "consultation recognizes Tribal sovereignty and the Nation-to-Nation relationships between the United States and Tribal Nations, and acknowledges that the United States maintain certain treaty and trust responsibilities to Tribal nations" (Biden, 2022). The memorandum further elaborates that the Federal-Tribal partnership must be in agreement through "mutually desired outcomes, and Tribes have the right to know how

their participation influenced final decisions (Biden, 2022). Although Federal agencies usually determine the necessity of Tribal consultation, they must respect every Tribe's request for consultation and "shall conduct that analysis as soon as possible and respond to the Tribe within a reasonable time period [to see] if there is a reasonable basis to believe that a policy may have Tribal Implications…" (Biden, 2022). Additionally, sections five, six, and seven provide general consultation protocols that can serve as a key starting point for others.

In 2022, the White House published a guide for Federal agencies to understand Traditional Knowledge and apply it into Federal decision making and research (The White House, 2022). Additionally, the guide encourages Federal agencies to promote co-management projects of lands and waters to grow mutual relationships and adequately use Traditional Knowledge (The White House, 2022). At the national level, these steps represent the American Federation's growing understanding and acceptance of Indigenous sovereignty and their rights over their ceded lands.

Through UNDRIP, the international community expands on the rights Tribal communities must impose themselves into conservation as follows:

Article 25 (United Nations (General Assembly), 2007, pg 19)*: Indigenous Peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.*

Article 26 (United Nations (General Assembly), 2007, pg 19)*: (1) Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. (2) Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.(3) States shall give legal reconciliation and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the Indigenous peoples concerned.*

Applying Concepts of Tribal Sovereignty and Rights to Interactions

What does an understanding of tribal sovereignty and rights look like in practice? These key lessons can guide interactions:

(1) Indigenous nations and people do not have an inherent obligation to serve the people of the greater colonial state. Practitioners should avoid using arguments that emphasize the "greater good" or urgency when working with Tribes. Additionally, emphasizing these types of moral arguments can be offensive as they overlook the colonial society's historical exploitation and suppression of Indigenous peoples and the resulting intergenerational trauma. For more information on intergenerational trauma, read pages 9-15 of *Strengthening Resilience: Promoting Positive School Mental Health Among Indigenous Youth* by the Mental Health Technology Transfer Center Network.

(2) Through their governments, Indigenous partners exercise self-governance that are of equal prestige to federal and subnational governments (i.e., states and provinces). As emphasized above, Indigenous agencies and Inter-tribal coalitions are of equal standing to Federal agencies and Intergovernmental organizations, respectively. Additionally, Indigenous peoples express their sovereignty through for-profit and non-profit organizations as well as enterprises. Because these organizations reflect Indigenous self-determination, one should recognize that these organizations hold the same high level of self-determination as Tribal nations, and they are of higher stature to similar Western organizations. Consequently, ALL practitioners in governmental, private, and non-governmental organizations (NGOs), should treat ALL Indigenous partners with the same respect as they would Federal personnel. These organizations, especially NGOs, should neither take the involvement of Tribal personnel lightly nor devalue the Tribe's goals for collaboration. In other words, NGOs and other practitioners should not treat Tribes as replaceable or passable if they offer to collaborate.

(3) Since conservation/preservation NGOs and personnel have an obligation to work with Tribes as equal partners as well as respect Tribal self-determination and governance, they should not feel self-righteous or charitable for including Tribal partners. Being self-righteous can unintentionally influence an individual to fetishize Indigenous knowledge and involvement, which will strain relations. On the other hand, the charitable mindset creates a mental power dynamic that devalues Indigenous involvement and knowledge to simply checking a box. Interact with Tribes and Indigenous partners with humility and respect.

Understanding Indigenous rights and sovereignty is key to understanding the importance of cooperating with Indigenous partners. However, even if an organization or individual recognizes these principles, they can still pursue and develop relationships in a problematic way. Oftentimes, Western practitioners or organizations pursue extractive practices, such as taking from the Indigenous community, then simply leaving instead of maintaining the relationship. Other times, Western practitioners or organizations exploit Traditional knowledges and cultures to benefit themselves without the consent from the Tribal entity. For example, an organization or individual may, either intentionally or unintentionally, fetishize an Indigenous culture or knowledge to improve their own image. To better respect Tribes as partners, it is also key to understand *Free, Prior, Informed Consent.*

Exchanging Knowledge and Collaboration

Free, Prior, Informed Consent

To respect Indigenous autonomy, Settler institutions must earn the free, prior, informed consent of Indigenous partners. UNDRIP repeatedly emphasizes the principle of free, prior, informed consent. Similar to Executive Order 13175, in Section 1 of Article 19, UNDRIP emphasizes that "States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their *free, prior and informed consent* before adopting and implementing legislative or administrative measures that may affect them" (United Nations (General Assembly), 2007, pg 16, emphasis added). To highly emphasize, free, prior, and informed consent is not a one-time process,

and one should apply the principle throughout all phases of the project, such as project formulation, application, monitoring, and expansion. Therefore, it is important to understand each of the four parts of this principle:

Free: Indigenous peoples have the right to not be coerced or tricked during the negotiation process (CTKW, 2014). In addition, Indigenous peoples have the right to refuse to initiate conversations and are free to turn away at any point during the negotiation process. During talks, Indigenous partners maintain the right to remain silent or offer vague responses when prompted with culturally sensitive questions (Wells, 2014), especially if they believe the questioner is not yet worthy of the requested information. Additionally, Tribes have the right to determine the rules and structure for negotiations in accordance with their social and cultural customs as they see fit. Tribes should be allowed to practice their rights without facing economic, legal, social (i.e., threats, humiliation, or shame), or other forms of retaliation (i.e., restrictions in or removal from participation in future projects).

Prior: Settler institutions should ensure that Indigenous partners are included in the earliest stages of plan development. Instead of simply being presented with a complete plan or different goals to choose from (Whyte et al., 2017), Indigenous peoples should be consulted in the formation of goal alternatives to ensure their own interests are reflected (CTKW, 2014), or at the very least honestly considered. This step also involves Indigenous partners assessing the project's potential benefits, harms and future uses in accordance with their values and ethics (Carrol et al., 2020), then advising how to promote Indigenous interests while minimizing harmful impacts. Since Indigenous peoples should be involved in all levels of decision-making and management (Mauro and Hardison, 2000), *prior* consultation also helps Indigenous partners to determine how their capabilities can best help the project as well as best prepare to meet the responsibilities of the project while fulfilling their own priorities. Poor planning increases the risk of Indigenous partners leaving the project or not meeting project deadlines due to being preoccupied with greater tasks. To increase the odds of establishing mutual trust, it is best to form and maintain friendships with Tribal communities far before the formulation of any project (Tribal Adaptation Menu Team, 2019), and appropriately participate in cultural significant activities to learn Indigenous perspectives through experience (Whyte et al., 2017).

Informed: Settler organizations are responsible for being transparent about their intentions and desires in relation to the project. This also involves the organization explaining their understanding of the project-specific costs, benefits, and risks (CTKW, 2014) as well as highlighting the organization's strengths, weaknesses, opportunities, and threats (i.e. SWOT analysis). Additionally, the settler organizations are responsible for understanding how participating in the project or the project itself could threaten the Tribes. Risks include, but are not limited to, the privacy of knowledge (i.e., the Freedom of Information Act), ownership of data (TKs lack Intellectual Property protections), cultural appropriation, reduction of or reduced access to usufructuary resources, and degradation of cultural or spiritual entities. The organization should also specify their intended uses for specific TK as well as who will have access to

the information throughout and after the project. Additionally, the Settler organization should be prepared to honestly and concisely respond to questions and requests for more information (CTKW, 2014) as well as keep Tribal partners updated about changes in information without them having to ask (Whyte et al., 2017). Organizations should grant Tribes viewing access to or share copies of relevant resources so that the Tribe can explore the organizational information as they choose. Avoid using technical jargon (Lake et al., 2017), and be specific to avoid confusion caused by vague generalizations, especially regarding responsibilities (Kalafatis et al., 2019). Ensure that both sides share common understanding of key concepts to avoid miscommunication (e.g., Western and Indigenous views on "invasive species" are very different).

Consent: Before performing any action, the Settler organization should ensure they have the explicit approval of the Tribal partner(s). The settler organization should never assume that a Tribal partner would accept a course of action. For example, if one has not obtained explicit permission for all future incidences, one should not record information in any way (i.e. notes or voice/video recording) without obtaining permission for a particular discussion (CTKW, 2014), even if the knowledge holder has approved of recording discussions in the past. Expanding on this, one should only use shared knowledge in the specific ways that were agreed upon prior to a discussion. The knowledge holder reserves the right to restrict permissions for any information as they see fit. For instance, the knowledge holder may allow information X to be used for purposes 1 and 2, but only allow information Y to be used for purpose 1. Settler organizations should allow knowledge holders to confirm shared Traditional knowledge by letting them rephrase, remove, or add information to transcripts of their discussions (Tribal Adaptation Menu Team, 2019). If the Settler organization wishes to use the shared knowledge in a new fashion, they are obligated to gain the permission of the knowledge holder and allow the individual to make more edits as necessary (Tribal Adaptation Menu Team, 2019).

After individual knowledge holders are consulted, the Tribe at large must consent to the release of information, and this may vary based on the cultural and social systems of a specific Tribe. Some Tribes may require a Tribal council, department, or appointed/elected expert to approve the release of information, while others may require community approval after community discussions. Some may do both. These larger approval processes are made to ensure that an individual does not share sensitive information that, when exposed, will then pose a threat to the rest of the Tribal community (i.e. locations of culturally important species, medicinal knowledge, traditional stories). At both levels, Indigenous partners reserve the right to retract any information at any time for any reason, even if the TK is essential to the final goal (i.e. justifying a policy) or product (i.e. key findings within a research report). Final approval will take time, and Western researchers should prepare to work through any traditional decision-making processes that are consistent with a specific Tribe's laws, customs, and practices. Additionally, to protect Indigenous partners, protections should be discussed and set that allow Tribal partners to ensure they are recognized for their work as well as remedy or shut down any misuses of their knowledges through legal action (Ahmad, 2010).

After understanding the principles of *FPIC,* Western practitioners are far more equipped to pursue cooperative agreements with Indigenous partners in a good way. Despite understanding these principles, Western practitioners are still capable of misunderstanding or mishandling the information that the Indigenous partners share with them. If a Western practitioner or academic is not informed about the fundamental aspects of Traditional knowledges, then they will have greater difficulty in understanding shared information and wisdom. Furthermore, the constant need for Traditional Knowledge holders to boil down information for a Westerner's understanding not only causes nuance to be lost in translation, but also reinforces the power dynamic of Traditional Knowledges serving Western Science. Therefore, to help build respectful partnerships with knowledge holders requires a deeper appreciation and understanding of the elements and appropriate application of Traditional Knowledges, which we cover in the next section.

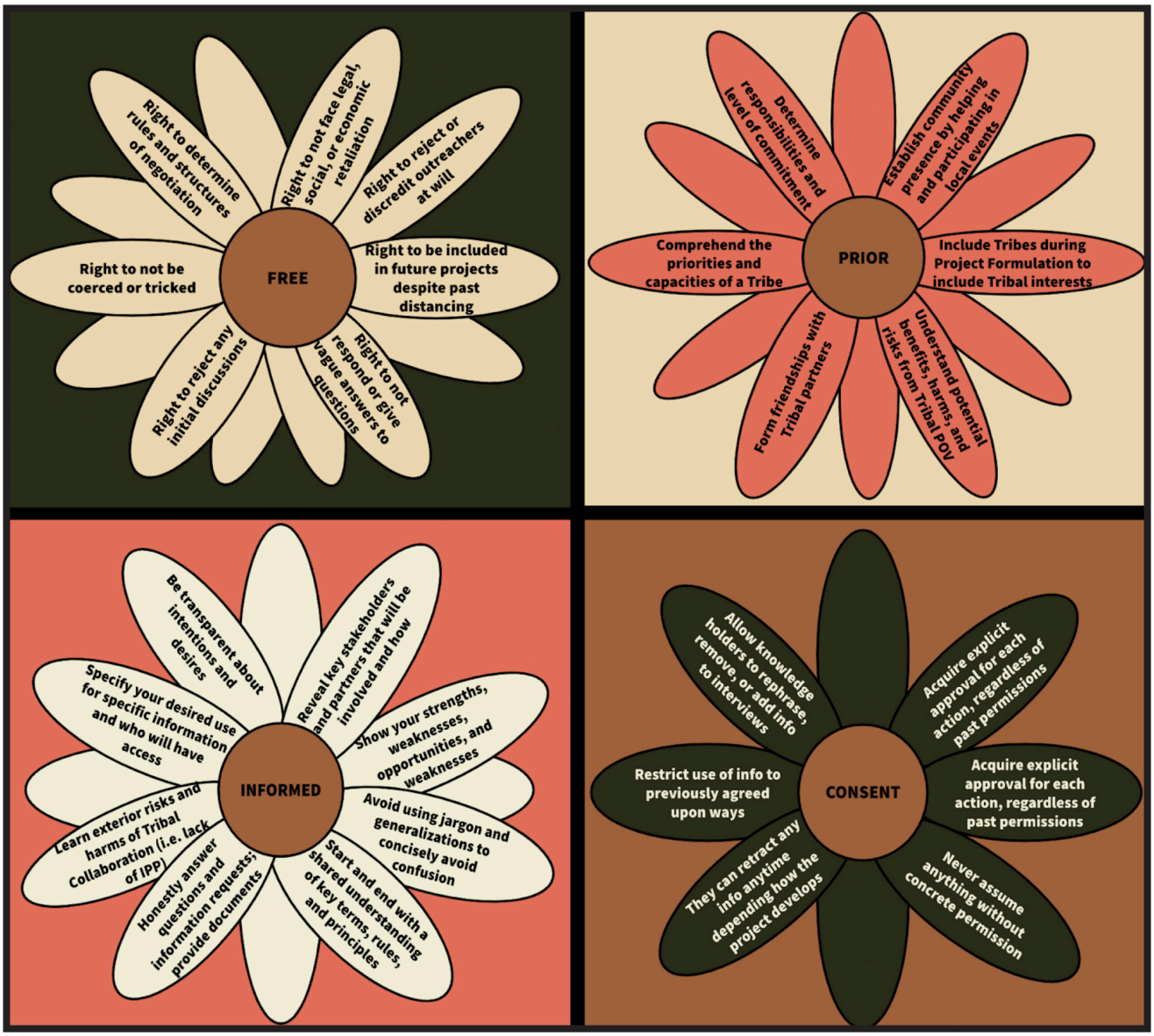


Figure 2.6. *Flow diagram of different asters summarizing FPIC principles with key lessons as petals. | Vincent Salgado*

UNDERSTANDING TRADITIONAL KNOWLEDGES

Traditional Knowledge (TK), though becoming a more commonly used term in restoration literature and practice, can often be used as a catchphrase despite a poor understanding of its meaning. In this section we provide a richer and more accurate overview of what TK actually refers to, and the risks associated with seeing TK as a separate knowledge base that can be obtained or used. We also delve into Tribal philosophy to facilitate a practitioner's personal development and mindset shift that will lead to a better comprehension of Indigenous values and preparation for forming personal relationships with Indigenous partners.

What are "Traditional Knowledges"?

A Traditional Knowledge (TK, aka Indigenous Local Knowledge, Tribal Knowledge; or Traditional Ecological Knowledge, TEK) is an assemblage of information and insights that a community has gathered as they lived in and adapted to their local place across many generations (CTKW, 2014). To survive, many Indigenous nations needed to learn the life histories and community interactions of their neighboring species (Lewis, 1985), and their knowledge specialized to their local ecosystems and biological communities (Kimmerer, 2000). Because these communities' continued existence was directly dependent on the continuance of the biological community, they became intimate and attentive to the environment (Whyte, 2013), and this serves as the foundation for ethical and spiritual relations with and responsibilities to the land and non-human life (Pierotti and Wildcat, 2000). As the land, biological community, and human civilization became interdependent on one another, the land and non-human life shaped the peoples' respective rituals, language, and philosophy (Salmón, 2000), which, in turn, shaped the gathering and sharing of knowledge across generations. Additionally, because humans are an integral, inseparable part of their ecosystems (Pierotti and Wildcat 2000), the cultural and spiritual contexts of the people are inseparable from a Traditional knowledge (Kimmerer, 2000). Indigenous communities understand these contexts through rational, sensory, emotional and spiritual lenses (Kimmerer, 2000), and their empirical observations form a more holistic view of the landscape that does not distinctly partition into different "disciplines" — such as history, sociology, ecology, biology, and anthropology (Pierotti and Wildcat, 2000). All aspects of a Traditional Knowledge are interwoven. Key aspects of TK can be remembered as DESCK:

Choice of Terminology

Use the terminology that an individual Tribal community prefers instead of TK or its equivalents. For example, "TEK" is a Westernized understanding of their knowledge systems, and the term can imply that the knowledge is either antiquated or is derived from a Western understanding of nature (Reo and Whyte, 2012). Stewards should allow Indigenous peoples to define what Indigenous knowledge means for them then appropriately use that terminology in future partnerships (Whyte, 2018).

[For consistency, TK will still be used to refer to these knowledge systems throughout this paper.]

Diversity: The use of a singular form of Traditional Knowledge (or its variants) overlooks the variety of knowledge systems held across and within Indigenous groups. Firstly, there are multiple embodiments of what is considered "Traditional Knowledge" because of the diverse landscapes that they are formed upon. However, this is not to support environmental determinism (a concept that argues that a civilization's

surrounding environment and resources solely determine development), as each Tribal collective also influences the land to support their respective cultural norms values. Additionally, the intersectionality of Tribal identities (as described above) influences the information gathered within and across levels. As a result, just as eco-diversity is influenced by cultural diversity and biodiversity (Martinez, 1997), so, too, is the diversity of Traditional Knowledges. Asserting a single Traditional knowledge is an attempt to homogenize Indigenous peoples and their knowledges. Neither are monoliths. Thus, on a national scale, the phrase Traditional Knowledge*s* (plural) is more accurate and appropriate than mistakenly referring to a nonexistent singular knowledge. Because of regional differences and varied cultural and linguistic histories, Anishinaabe knowledge, Haudenosaunee knowledge, Oceti Sakowin (Sioux) knowledge, Cree knowledge, and Muskogean knowledge, Inuit Knowledge, Hawaiian are distinct from one another, each with immense internal variation and complexity. Therefore, when focusing on a narrower scale, such as regions, it is best to be as specific as possible.

Group painting with a diversity of Indigenous cultures (Douglas, 2021).

Ecology: The aspect of TKs that Westerners refer to as "TEK" contains knowledge about special relations, population dynamics, community interactions, sustainable resource management, and disturbance regimes (Whyte, 2013). More generally, TKs can help determine environmental baselines/benchmarks, highlight environmental and cultural consequences of ecosystemic change and mitigation efforts, and gather specialized knowledge through local observations (CTKW, 2014). More specifically, fire-related Traditional Knowledges include, but are not limited to, phenology of local flora and fauna, impacts of fire on flora and fauna, seasonality of fire use, dry and wet seasons impact on fire use, moisture of fuels (both living and dead), fire intensity, fire frequency, controlling fire behavior and spread, and repercussions of not using fire (Huffman, 2013; Lake et al., 2017).

Spirituality: TKs offers insight into supernatural phenomena and spirituality when healing human-ecological relations (Whyte, 2013). According to many TKs, healing nature heals one's own spirituality (Kimmerer ,2011), and TKs espouse that conducting fires is fulfilling one's spiritual responsibility to the landscape (Kimmerer, 2002), as the Creator gifted fire to humanity to keep the land clean and healthy (Mason et al., 2012). However, one does not need to believe in unperceivable phenomena to expand their spirituality, as the simplest form of spirituality is a heightened respect and admiration for ecological entities. For example, prayer is often seen as a request to a divine power, yet TKs assert that prayer can be an active recognition of and gratitude for one's space and the natural forces that created and continue to influence one's place (Pierotti and Wildcat, 2000), including reverence for one's ancestors and future generations (CTKW, 2014). Spiritual connections

then create responsibilities for one to follow to ensure that entities of spiritual importance (both human and non-human) persist into perpetuity (CTKW, 2014). In addition, these spiritual connections motivate individuals and communities to aid in conservation efforts.

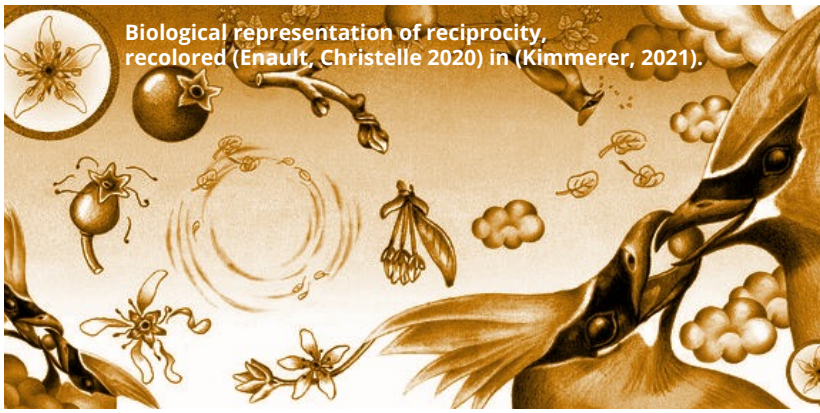
Culture: Social rituals and customs not only help individuals to internalize ecosystemic responsibilities but also promote social, cultural cohesion and values (Berkes et al., 2000). The community will espouse these responsibilities within ecological management while discouraging environmentally-degrading behaviors, such as using taboos or social outcasting (Berkes et al., 2000). In turn, this shared understanding will reinforce a social identity that will gain greater association as the identity becomes more prominent (Kalafatis et al., 2019), strengthening local support in fire. Similarly, folklore — such as cultural beliefs, mythologies, and festivities — helps preserve ecological information and ecological responsibilities as well as facilitates their spread (Berkes et al., 2000). Additionally, songs, poems, and stories relating to the environment also promote greater public understanding, trust, and acceptance of included knowledge and responsibilities (Kimmerer, 2002). The lessons from these narratives then can help reinforce appreciation and admiration for the human-environment relations, which will then provide Western Science with spirit and compassion (Kimmerer, 2002). Because of the immense importance of community, both youth and elders should be included in learning and practicing TKs. Youth bring optimism and energy to knowledge, and their participation helps ensure the preservation of cultural practices and values (Whyte et al., 2017). Elders serve as supportive role models, and they help

"Wisdom of the Universe" (Belcourt, Christi 2014).

youth better absorb cultural values and wisdom. Respecting and appreciating both youth and old are essential to development and the maintenance of knowledge.

Kin-centrism: Intertwining the concepts above, many Traditional Knowledges emphasize the philosophy of *Kin-centrism* that espouses that humans are necessary for the natural world to flourish to the point where the success of both become intertwined (Martinez, 1997). TKs emphasize that all living and non-living entities are connected through webs of relationships (Wells, 2014), and all the behaviors, thoughts, intuitions, and spiritual forces of all these entities intertwine for the continuation of life (Whyte et al., 2016). Furthermore, all living entities, water, and land have responsibilities to one another to sustain life as a whole (Whyte et al., 2016). If humans do not use their neighboring species for their purpose, they will gradually disappear because they do not feel appreciated (Reo and Ogden, 2018). From a pragmatic view, the use of neighboring species motivates humans to fulfill their role as caregivers to ensure the species both remain plentiful and persist (Kimmerer,

2000). Because humans are an integral part of the web as well as the history of a place, TKs argue that nature does not exist independent of humans (Pierotti and Wildcat, 2000), which contrasts the historical dichotomy of "civilization" contrasting "pristine" nature. Humans, through changing their social and cultural norms to better suit their surroundings, become more intertwined with their landscapes and neighboring kin to ensure all persist (Whyte, 2018).


Biological representation of reciprocity, recolored (Enault, Christelle 2020) in (Kimmerer, 2021).

One should not attempt to extract individual parts of TK. Expanding on this concept, traditional ecological knowledge (TEK) refers specifically to the "relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways [such as] hunting, fishing, trapping, agriculture, and forestry" (U.S. Fish and Wildlife Service, 2011). By focusing solely on TEK, Western academics ignore the greater social and spiritual contexts from which this information originated, especially if said knowledge is manipulated to fit Western understandings. To respect TK, one must be considerate of the holistic worldview the knowledge belongs to (Kimmerer, 2002), and this requires having respect for the land, language, ethics, religion, and culture of the Indigenous community (Mauro and Hardison, 2000). If researchers attempt to separate "TEK" from the social and spiritual context in their pursuit of "objectivity", they devalue both the knowledge and the culture (Kimmerer, 2000). To best understand and respect TK, one should aim to understand the social and epistemic perspectives of the Indigenous community (Ludwig, 2016). This will then require restoring one's relationships with the land and other life (both human and non-human), including heightening one's moral character, as they delve into the learning about the Indigenous culture (Whyte, 2013).

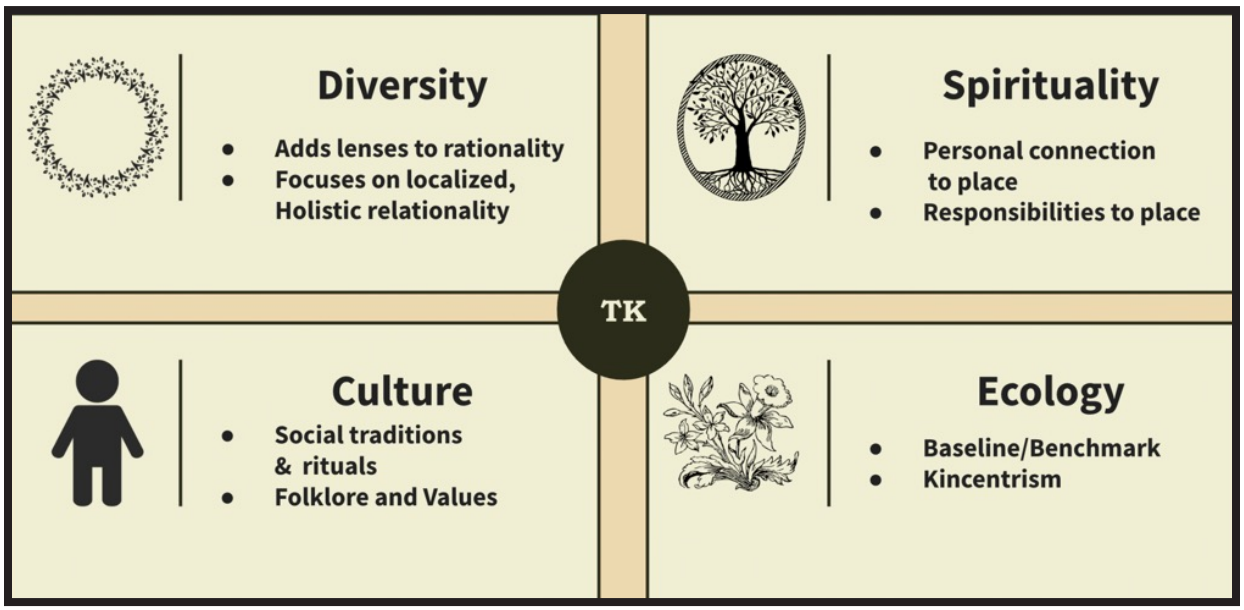


Figure 2.7. *Table summarizing key points about Traditional Knowledges | Vincent Salgado*

How can Knowledge Systems Cooperate?

Similar to species adapting to a specific ecosystem, some knowledge systems are better adapted to understand some contexts better than others, and no single knowledge system is able to succeed in all circumstances. Consequently, all knowledge systems are often incapable of adapting to a distinct ecosystem or environment and ineffective in understanding the complexity of and sustainability within said ecosystem (Kimmerer, 2002). Only understanding one knowledge system or way of thinking limits how one is able to perceive one's ambiences, so one should comprehend multiple ways of knowing to optimize one's ability to deeply comprehend and analyze one's ambience. Furthermore, a lack of epistemological diversity can lead to misunderstandings, unintended consequences, or maladaptations that cause further environmental degradation (Kimmerer, 2002).

To re-emphasize, Traditional Knowledges are deeply established in their respective geographies because they focus on building a holistic understanding of their ambiences (Ludwig, 2016). During investigations, Traditional scholars use ecology, language, ethics, and religion to understand human- ecological relations within their landscapes (Kimmerer, 2011). However, because of the immense depth of analysis, it is difficult to extrapolate the information to landscapes outside where the knowledge originated. Similarly, Traditional scholars will prioritize establishing relationships to the land (Whyte et al., 2016) through physical, spiritual, mental, emotional, and intuitive connections to the land, heritage, history, tradition, and experience (Whyte, 2013). Because of the immense complexity, it is difficult to establish the

TKs' Main Critiques of Western Stewardship

TKs often criticize Western views of ecological management. Firstly, the term "management" is controversial to TKs because the term implies one owns and controls those one manages (Mason et al., 2012). Additionally, TKs argue against the commodification of natural resources as those that have no economic value are neglected, and Elders often emphasize that they would rather allow a species to go extinct than subject them to commercial exploitation (Martinez, 1997). Additionally, the separation of humans and nature reinforces the command and control structure (Reo and Ogen, 2018). Humans externally manipulate nature as a mechanistic entity to maximize the efficiency of ecosystem functions and biodiversity (Kimmerer, 2000). The resulting utilitarian model still reflects an extraction mindset as the value of an individual is based on how they contribute to the idealized maximization, and this then allows different species to become "tradeoffs" in decision making. Because of this, TKs argue that conservation should focus on giving to rather than taking from natural areas (Kimmerer, 2011). What that entails will depend on one's specific environment and neighboring ecological relations, but all areas will require giving more respect to other lifeforms. A common yet often overlooked aspect of the Western perspective on nature is the use of the word "it" to refer to non-humans. This term robs other life of personhood as they are objectified (Kimmerer, 2011). The distinctions between referring to humans and other life not only concretizes the separation of nature and humanity, but this concept reinforces human dominance as humans are not subject to objectification. Furthermore, Current Western management often emphasizes that humans are stewards because other species are unable to care for themselves, setting up our kin as ignorant victims. People ought to have trust in the adaptive abilities of their neighboring species, as over helping a species emphasizes that one does not have confidence in that species (Whyte et al., 2016), which leads to paternalistic relationships. Furthermore, TKs emphasize that we should observe species as teachers and elders as all entities have lessons and guidance to share (Pierotti and Wildcat, 2000; Reo and Ogden, 2018). However, Western perspectives on epistemology emphasize that only humans have knowledge to share, and, when applied to conservation, this perspective reinforces the paternalistic idea that humans are there to lead nature. TKs argue that humans ought to accept that their role is not to dictate nature but rather to maintain balance across competing influences between and the multifaceted nature of each entity (Kimmerer and Lake, 2001).

same level of admiration and understanding for various landscapes. Despite the differences in these knowledge systems, the Settler Colonial society has viewed Traditional Knowledges as competitors to Western thought — evident in its attempts to erase Indigenous memory. However, as we will see, this dichotomy of Western Science being incompatible with Traditional Knowledges is false.

According to foundational ecological principles, two species striving for the same resources are deemed to be competing species. Competing species then have two options: niche differentiation or displacing the other. The latter will only perpetuate Western colonialism, so that approach is not an option. If the two systems fully diverge from one another — scholars voluntarily pick one or the other, Western Science will continue to perpetuate the same complications while Traditional Knowledges will be restricted to their respective Indigenous Tribes. Aggravatingly, much Traditional Knowledges will degrade from either the imposition of Western knowledge, climate change significantly manipulating local conditions, or a combination of both. Additionally, the West's oppressive and exploitative treatment towards Indigenous peoples obligate Settler institutions to assist Indigenous peoples in retaining and expanding their knowledge systems. As a result, Western ecology would assert that there is no course of action for two competing epistemologies to coexist. However, Traditional Knowledges offer a third option for competing species: mutualism. This brings us to the story of Coyote and Badger, a synergistic relationship that challenges the Western conception of species competition (Pierotti and Wildcat, 2000).

Overview of Western Science

During investigations, Western Science applies an analytic approach that focuses on a single entity or characteristic and its individual importance or influence within a larger setting (Ludwig 2016). Additionally, Western Science follows a generalist model in which information is extracted from multiple areas to create key themes (or show a lack thereof) that inform abstract, "objective" theory and models (Kimmerer 2000). As a result, Western science effectively highlights lessons that are shared across ecosystems, but it often has difficulty in understanding the complex relationships between different factors within a specific context or nuances across similar contexts. In relation to sustainability, Western academics often focus on applying top-down approaches that prioritize the generalized theory with little consideration for how local nuances in human-ecological connections will interact with said approaches (Whyte et al. 2016). The need for understanding local nuances then serves as an opportunity for Traditional Knowledges to teach Western practitioners. Be sure to think about how this overview compares to your understanding of Western Science (and ecology), then compare both to the ideas espoused by Traditional Knowledges.

This small excerpt alone provides several lessons for working with both Traditional Knowledges and Institutional Science. Firstly, just how Coyote should not be deemed inferior for Badger's better digging and how Badger should not be deemed inferior based on Coyote's better chasing, one should not deem either Traditional Knowledges or Institutional science to be superior to the other since both excel in different areas. Secondly, just as Coyote and Badger remain two distinct beings during their hunt, it is not appropriate to blend Traditional Knowledges with Institutional science to create a singular epistemology or vision. Instead, one should learn to analyze with two lenses as to intertwine these knowledge systems while showing respect and admiration for the individuality of each one (Kimmerer, 2022). Thirdly, just as Badger is not required to give Squirrel to Coyote (or vice versa) after a successful hunt, one

In short, like how Coyote and Badger have different, independent strengths that they bring to the hunt, Traditional Knowledges and Western Science bring different strengths to understanding ecosystemic knowledge and relations. Many Tribal communities have already been using their respective TKs in combination with Western Science to fulfill local priorities (Whyte, 2018), and each individual Tribe will determine how Western Science benefits them. In other words, it is not our place to say how Western Science benefits TKs. On the other hand, Traditional Knowledges can assist Institutional Science not only by providing empirical, ecological evidence, but also by guiding Institutional Science in developing community and promoting ecological responsibility (Whyte et al., 2016). However, even with the intertwining of Western Science with Traditional knowledges in a good way, one must understand the unavoidable factors that can complicate relationships.

Concerns Regarding Using Traditional Knowledges

The arrival of Europeans and their colonialism of and oppression against Indigenous peoples has vastly disrupted Traditional knowledges. Additionally, the contemporary imposition of Western worldviews onto Tribal systems further creates challenges for protecting Traditional Knowledges. To clarify, these following concerns are *not* justifications for refusing to work with or outright dismissing Traditional Knowledges as a whole. Instead, Western practitioners should understand them so that they may better prepare to warn Tribal partners about the risks as well as limit the exposure of sensitive Traditional Knowledges.

Coyote and Badger

"Coyotes and badgers wander around together, but when they see a squirrel, coyote gives chase. If the squirrel goes into a burrow, badger will dig up the burrow, or both will die together. If the squirrel leaves by another burrow exit, coyote often gets [the squirrel] and has a meal. Food is not shared, but both coyote and badger catch more squirrels when they hunt together than when they hunt alone." (Pierotti and Wildcat 2000, pg 1338).

Epistemicide: The United States has actively sought to erase Indigenous Knowledge through genocide, forced removal, forced assimilation, and forced schooling of Indigenous peoples (Carroll et al., 2019). Not only were many Indigenous communities forced to rely on Western science to ensure their communities survived (Carroll et al., 2019), but the lack of practicing TKs also led to the further loss of information that survived the genocide and schooling eras. Furthermore, Traditional Knowledges continue

to be lost as Western lifestyles and values continue to be imposed onto Indigenous communities (Carrol et al., 2020) and more Indigenous Elders pass on without sharing their knowledge to the next generation. Additionally, many of the surviving Indigenous languages and traditions that are essential to passing down TKs are weakened or at risk of being lost because of assimilative pressures from Western society (Ahmad, 2010). Yet, despite all these factors, many Indigenous communities optimistically believe that the knowledge is not lost forever, as the Creator will regift the knowledge when people are ready to receive said knowledge (CTKW, 2014). In the meantime, Indigenous communities have been and are actively adapting and expanding their respective knowledge systems. Western practitioners must be careful to not criticize or dismiss them for any gaps in knowledge.

Changed Landscape: Since the American conquest, much of the fire-dependent landscape has changed dramatically. In addition to many fire-dependent ecosystems being lost to human development, the lack of fires has allowed ecological succession to cover previous fire dependent areas (Dorney and Dorney, 1989), and the increased levels of vegetation have enhanced fire intensity and occurrence (Mason et al., 2012). Warming climates and drought are increasing the levels of dry fire fuel that further increases fire's intensity and destructive ability (Wells, 2014). Additionally, the vast ecological succession and the expansion of exotic vegetation has greatly altered fire regimes (Mason et al., 2012), and some exotic species can compete with fire-dependent species in post-fire conditions (Wells, 2014). Climate change is expected to further impact the needed weather for fire and how fire influences species dynamics and interspecies relations (Huffman, 2013). Both the vast expanse of urban and agricultural industrialization and the intensification of anti-fire government regulations have increased the difficulty of conducting fires, as colonial settlers are concerned about wildfires and smoke (Lake et al., 2017). Because of the changed conditions, the use of fire will inevitably lead to unintended consequences of fire use, fire escapes, and excessive greenhouse emissions (Huffman 2013), and fire-related Traditional Knowledges may become subject to public critique upon these instances. Because governments pursue a highly reactive command-and-control policy that prioritizes fire restrictions (Huffman, 2013; Huffman, 2014), one must consider the risk of governments attempting to investigate and intercept Traditional Knowledges in the guise of promoting fire safety.

IPP (or lack of): Intellectual Property Protections (IPPs) are copyrights that are used to protect intellectual works of individuals from wrongful use. IPPs ensure the original author of a work retains ownership of said work as well as is appropriately compensated for its use. Current IPPs often require that a work or invention (1) be created by a single, individualistic entity, (2) be novel (meaning not previously known to others and a sufficient, distinctive improvement from previous works or use), (3) have a practical or industrial application, and (4) be in a fixed form — such as in writing or an audio recording (Ramachar and Sinjela, 2005). Consequently, IPPs often do not protect Traditional Knowledges because they (1) are produced by the community across generations and lack a distinct inventor, (2) are collectively owned, (3) are often generations old, (4) are not novel because the information's spread across the community, (5) often do not have a specific and

practical application, and (6) are often kept through dynamic means, such as oral or dance (Ramachar and Sinjela, 2005). Traditional knowledge holders often place themselves as the "inventor" to provide some argument for IPPs, but this precaution may not be enough for much information from Traditional Knowledges. It is highly important to remember that after a publication — by either academia or government, the associated knowledge will now be harder to guard, as it is now part of the public domain, meaning it has free use. Consequently, third-parties will not be required to provide credit or compensation of any form to the individual Traditional Knowledge Holder or the Indigenous community.

FOIA: The Freedom of Information Act (FOIA) is a Federal law that allows any individual to gain access to records from any Federal agency. Even if an agency were to be discreet about the information they initially release to the public, a FOIA request may grant third-parties access to more specific, sensitive information. The third-party can then use the information however they chose with no consideration about how the hidden contexts of the gathered information or how their use of the information harms Indigenous interests. Similarly, if a Tribe were to apply for federal funding, said Tribe would be required to publicize any Traditional Knowledge that will inform their project (CTKW, 2014). To complicate the matter, each state government has a system of FOIA for their state agencies. As a result, government personnel should be aware that their use of Traditional Knowledges has a good chance of releasing said information to the public domain and warn Tribal partners accordingly.

Traditional Knowledges are epistemologies that prioritize a detailed and complex understanding of one's place. Despite the differences between Traditional Knowledges and Western Science, one should not view them as competing forces. Instead one should view how the two can complement one another. However, viewing with two lenses is a difficult goal to achieve as it will take much time of learning and direct experience to craft this other lens. For the time being, one should look to Traditional Knowledges as a teacher and contemplate how Western Science can grow. *Think about how Western Science can do this in a good way that respects Indigenous sovereignty and integrity while avoiding putting Traditional Knowledges at risk.* To further improve relations with Tribal partners, Western practitioners should also understand the complex historical relations between Indigenous and Colonial powers.

THE HISTORY OF TRIBES DURING EUROPEAN SETTLEMENT IN SOUTHEAST MICHIGAN AND SURROUNDING TERRITORIES

The Need For A Historical Review

To better form relationships with Anishinaabe groups that will inform current prescribed fire practices, it is essential for ecological practitioners to recognize the history of exploitation and trust violations that stays in Anishinaabeg collective memory. Colonization is not just a historical problem; it is an ongoing process. A better knowledge of Indigenous history during European settlement combats the early American demonization of warring, "merciless Indian savages" (U.S. National Archives and Records Administration, 1776), the romanticization of the "Noble Savage" — the 18th century European belief that Indigenous peoples represented the ideal, innocent human, free from the corruption of "civilization" (Martinez, 1997) — and the misconception of a unidimensional Indigenous people with only a single history.

This historical overview of the Indigenous people within Southern Michigan highlights the Europeans' role in the subversion of a variety of Indigenous societies and the degradation of the Indigenous garden by vastly removing the Tribes who practiced fire on these landscapes. By accepting the history and rejecting stereotypes, Western fire practitioners and researchers can, with humility, better establish relationships with Tribes to shape a more equitable and inclusive future of land practices.

Timeline of Notable Events

Gens de Feu Dynasty (Early 1600s)

1609: Champlain helps the Wyandot in a fight w/ the Mohawk, cementing French-Haudenosaunee divide.

1616: Champlain learns of war between Odawa and the "Gens de Feu " Tribes occurring in Michigan.

Haudenosaunee Dynasty (1640-1701)

1640: Haudenosaunee begin Westward conquest to expand fur trade, displacing Tribes for decades.

1701: Beaver War ends in a stalemate, Tribes return.

French Dynasty (1701 - 1763)

1701: Detroit is established as a trading post.

1712: Fox Massacre occurs after failed uprising.

1754: Disputes over Ohio River Valley spark French and Indian War. George Washington's party was the last straw.

1760: British gain control of Detroit. French soon withdraw.

British Dynasty (1760 - 1783)

1763: French surrenders North American territory to the British; Pontiac's allies resist; Britain officializes borders.

1766: Pontiac's War officially ends.

1776: American Revolution begins.

1783: Americans win and gain control of the Midwestern Territories after series of faulty Treaty negotiations

Yankee Dynasty (1783 - Early 1800s)

1789: French Revolution Begins, monarchy soon overthrown.

1790: Americans declare war on Little Turtle's Northwest Confederacy who are aided by the British.

1795: Northwest Confederacy surrenders, but non-ceded lands become a Tribal Reservation.

1799: Bonaparte becomes leader of France.

1803: Napoleonic Wars begin; Louisiana territory is sold to the United States, intensifying expansion.

1805: Thomas Jefferson makes Michigan a U.S. territory.

1806: Tecumseh and his brother begin forming the Seventeen Fires Confederacy in the Midwest.

1807: Treaty of Detroit is signed.

1811: Americans begin to fight the Seventeen Fires within the Reservation territory.

1812: Americans declare war on British. British allies with the Seventeen Fires to seize American forts.

1813: Tecumseh is killed at Battle of Thames; Seventeen Fires Confederacy disbands.

1815: War of 1812 ends in a stalemate.

1819: Treaty of Saginaw is signed.

Early European Arrival

Gens de Feu Dynasty (Late 1500s - Early 1600s)

The exact history of Michigan prior to the 1600s is relatively unknown because the Europeans and disease killed many Indigenous historical scholars who memorized and orally shared historical narratives. Also, from the mid-19th century to the mid 20th century, the loss of Indigenous history was accelerated because the United States forcefully assimilated Indigenous youth at American boarding schools where they forbade the practice of Indigenous culture, language, and religion (Little, 2017). Because of this oppression, the available sources of early history are mainly European manuscripts, which are often negligent or biased against the Indigenous peoples and their points of view.

"Indian Encampment on Lake Huron" (Kane, Paul undated)

For at least a century prior to the arrival of Europeans, various Tribes of the Algonquian language family, who migrated from the Atlantic coast, lived throughout Michigan and the Great Lakes (Schaetzl, n.d.a). It is uncertain who lived in Michigan prior to the arrival of the Algonquian Tribes. Additionally, the specific ranges of individual Algonquian Tribes within Michigan during this period are unknown, though it is estimated that approximately 100,000 Indigenous peoples lived within the Great Lakes region, 15,000 of these living in modern-day Michigan (The Michigan Legislature, 2001). The vast majority of large settlements were along river valleys or the shoreline of the Great Lakes since the bodies of water were used for transportation and trade. Inland Michigan was mainly uninhabited, as many considered it only as a region to venture through to reach the opposite coast. Settlements were not permanent since communities often moved to where resources were more abundant. Around the settlements, communities would clear sections of forest for growing crops, including corn, squash, berries, nuts and beans (Library of Congress, n.d.b).

The Fox, Sauk, and Kickapoo Nations were the earliest known Nations to inhabit the Eastern Region of Michigan while the Bodéwadmi inhabited the Northern half of the lower peninsula (Figure 2.8). Each migrated from the East, but it is unsure when each first arrived. The Ojibwe and the Odawa — who were not dominant in the Lower peninsula at this time — referred to the Fox and Sauk people as Ozaagii or "those at the outlet," and the French grouped the Fox and Sauk with the Mascouten and Bodéwadmi as the "Gens de Feu'' or Fire people (Weiser-Alexander, 2018.). The Wyandot name for the Bodéwadmi, "Asistagueronon," also used to refer to the Fox and Sauk (Native American Nations, n.d.).

In 1616, the French explorer Samuel de Champlain, the "founder" of Quebec, learned that the Odawa and Neutral Nations were at war with the Mascouten Nation and the Asistagueronon (Native American Nations, n.d; Bélanger, 2004). Since the Bodéwadmi

were and are in a Confederacy with the Odawa, it is most likely that the “Asistagueronon" fighting the Odawa referred to the Fox and Sauk Nations. In addition to the expansion of the Anishinaabe, the Wyandot Nation, being assisted by French supplies, also fought against Fox and Sauk as they expanded into Southeast Michigan (Yost, 2021; New World Encyclopedia Contributors, 2022a). Decades later, the Haudenosaunee (Iroquois) Confederacy expanded into Michigan, and the Fox, Sauk, and Kickapoo Dynasty ended as the coalition retreated towards Wisconsin.

The Haudenosaunee Dynasty: The First Fur Conquest

French Meddling and Iroquois Expansion (1640-1701)

Beaver pelts were a key fur since the European elite desired high-quality fur hats (American History Central 2022), and the competition for fur would spiral into global conflict. Different Tribes became embroiled as allies or enemies of competing European interests, often to dominate traditional enemies.

The French, in pursuit of gaining greater control over the fur trade, formed alliances with many of the Tribal Nations around the Great Lakes. In 1609, Champlain assisted the Wyandot in a battle with the Mohawk, even firing his own musket, and they killed three

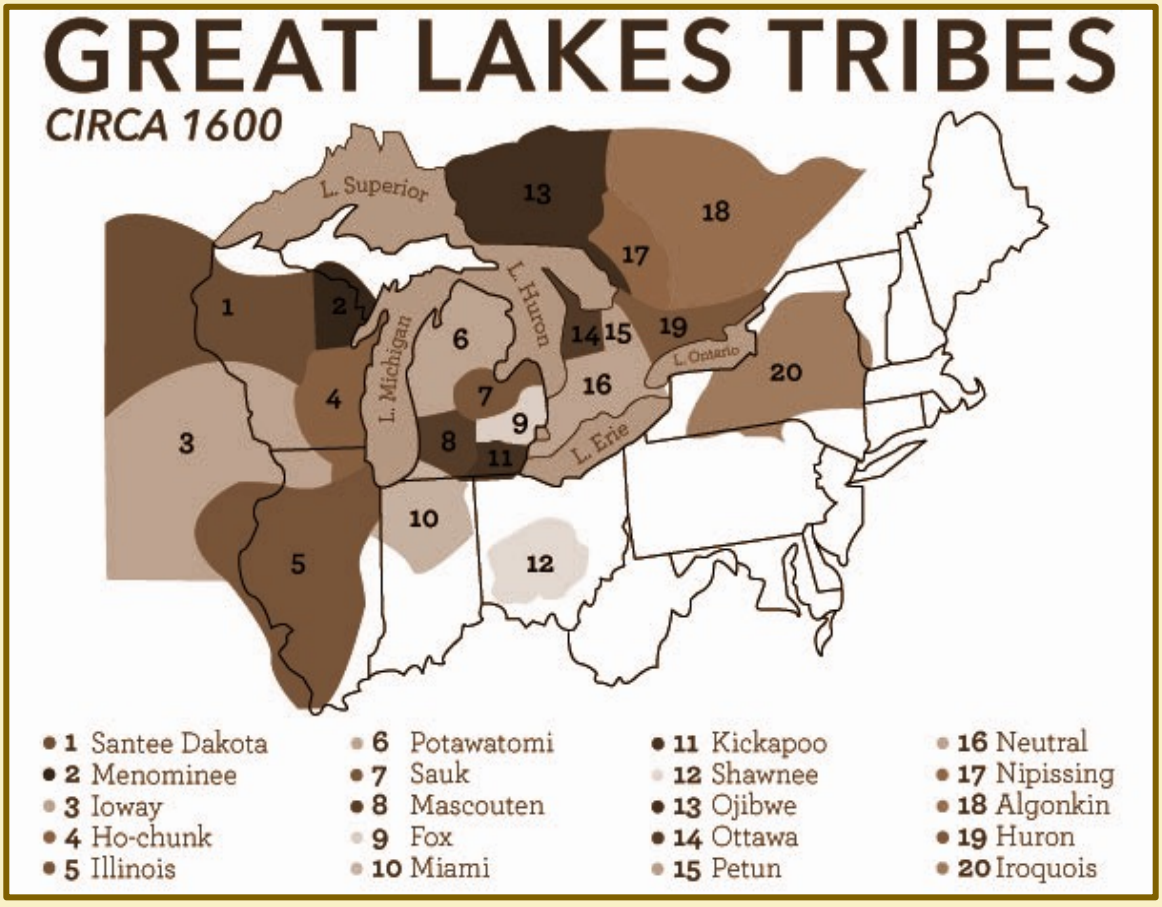


Figure 2.8. *Indigenous Nations and their respective territories around the Great Lakes in the early 17th century — prior to the Beaver Wars (Milwaukee Public Museum, n.d.a).*

Chiefs (The Michigan Legislature, 2001; American History Central, 2022). After the French sided with their traditional enemies, the Haudenosaunee Confederacy (HC) — who included the Mohawks — became the French's most powerful enemy within the region. Around this time, the HC began trading fur with the Dutch. As the Dutch became dependent on and demanded more HC furs, the HC became dependent on Dutch supplies, including firearms (Parrott and Marshall, 2019). After depleting the beaver populations near modern-day, upstate New York, the HC, using Dutch firearms, conquested westward to gain new hunting grounds and satisfy Dutch demand, displacing French-allied Tribal Nations within the Ontario and Ohio territories throughout the following decades (Ohio History Central, n.d.a; Figure 2.9).

In 1642, the conflicts between the Odawa and the Asistagueronon persisted, highlighted by a conflict in which the Odawa and Neutral Nations destroyed a Mascouten village in South-Central Michigan (Sultzman, 1999). As the war went on, the French fur demand remained high, so the HC then attacked Tribes, including the Ojibwe and the Odawa, that were supplying furs to the French allies (Tanabe, 2018). This led to the HC advancing into Michigan and, later, Wisconsin in an attempt to stop them.

Despite wanting to supply their Indigenous allies with firearms, the French, because of Jesuit persuasion, restricted aid to only those who converted to Christianity (Parrott and Marshall, 2019). By 1651, the HC defeated and disbanded the Wyandot; the Ojibwe and Odawa now led the fight to take the lost land and satisfy French demand (Nations at War, 2020b; United States Wars, 2012). By the mid-1650s, the Bodéwadmi, Mascouten, Sauk, Fox, Kickapoo, and others began settling Wisconsin, totalling over 20,000 refugees (Milwaukee Public Museum, n.d.b; Waséyabek

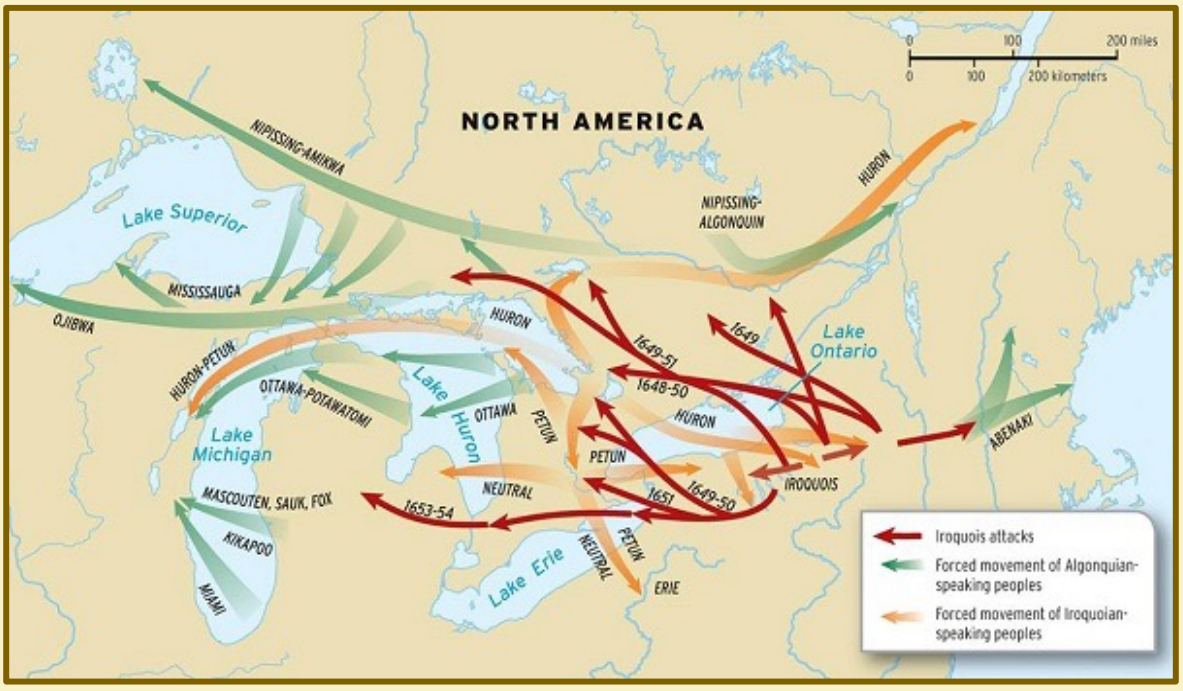


Figure 2.9. *Haudenosaunee advancement and associated displacement of other Tribes during the middle of the 17th century (Schaller et al., 2014).*

Development Company, LLC, n.d.). Some of the Wisconsin Tribes fought off incoming refugees, and tensions intensified as the refugees soon competed and fought with one another to supply local furs to the French (Sultzman, 1997). The limited resources in the area led to starvation and further fighting for hunting grounds (Tanabe, 2018). Years later, the Ojibwe, who had depleted resources because of the vast HC aggression, expanded westward into Northern Wisconsin, displacing the already established Dakota and Fox Tribes (Bell, 2011). This heightened tension between the Fox and Three Fires Confederacy would resurge in future conflicts. The warfare and disrupted trade made many consider Southern Michigan uninhabitable for decades (Sewick, 2016).

In 1664, the English, after acquiring New York from the Dutch, intensified their trade with the HC (American History Central, 2022), fueling the war

"Héroique défense de Dollard et de ses compagnons, 1660"
(Guenin, Eugene 1900)

effort with funds and firearms to control the French Fur Trade for themselves. One year later, the French sent a professional military division, the Carignan-Saliéres, to lead the front (American History Central, 2022). In 1666, the French division directly attacked the HC, and, after capturing an important Chief as well as burning down a village and surrounding crop fields, the Haudenosaunee established a temporary truce (United States Wars, 2012). During this truce, many illegal French fur traders entered the Western markets to capitalize on the abundant furs, yet many sold the illegal fur to the British instead (Milwaukee Public Museum, n.d.d). Later, in 1683, the governor of New France rekindled the war to regain the lost fur trade (RAOGK, 2015). As the French-Anishinaabe forces pushed the HC back, the Ojibwe and Odawa acquired territory along the Western shores of Lake Huron, and the Bodéwadmi — coming from the Southern edges of Lake Michigan — claimed land along the Western shores of Lake Erie for themselves. Although the Sauk and Fox participated in this advancement, they also continued conflict with the Ojibwe and Dakota in Wisconsin (Sultzman, 1999). As the French regained the lost fur trade, the illegal activity heavily inflated the supply of beaver pelts and decreased their price value (Milwaukee Public Museum, n.d.d). In 1696, the French Crown banned trading furs west of Montréal to stabilize the high price of the furs and — according to the Jesuits — stop the fur trade from further corrupting the Indigenous people (Milwaukee Public Museum, n.d.d; Sultzman, 1999). This policy failed and died two decades later.

After nearly two more decades of warfare, the HC, New France, and dozens of other Tribal Nations signed the 1701 Great Peace of Montréal. The Governor of Montréal, Louis Hector de Callière,

brought together 39 different Indigenous nations to discuss and negotiate their relations to one another and with France (Pointe-À-Callière, n.d.). After a week of discussion, many Tribal representatives were hesitant to finalize a Treaty, but Wyandot Grand Chief Kondiaronk convinced them to settle for peace during the final hours of his life, as he soon passed from sickness (Pointe-À-Callière, n.d.). The French were satisfied since the HC agreed they would allow the Great Lakes refugees to return to their lands and that their Nation would serve as a neutral, buffer state between the French and the English (United States Wars, 2012; Jaenen and McIntosh, 2019). In return, the French allowed the Haudenosaunee to freely trade within French territory, and the French reduced the cost of goods for Haudenosaunee consumers (Jaenen and McIntosh, 2019). Although they were allowed to return to their homelands, many of the foreign Tribes refused to surrender the lands they occupied as refugees, eventually proceeding to expand into Illinois (Sultzman, 1999).

Concurrently, to avoid further territorial conflict and resolve disputes over the buffer region between areas under Anishinaabeg control and those under

"Frontenac dancing the war dance, 1690" (Jeffreys, Charles William 1914)

"Le gouverneur Louis-Hector de Callière au moment de la signature du Traité de la Grande Paix de Montréal" (Back, Francis undated).

Haudenosaunee control, the two regional powers agreed to the Treaty of One Dish with One Spoon — referred to as Gdoo-naaganinaa in Ojibwe (Glover, 2020). After Kondiaronk passed, Haudenosaunee chief Aouenano shared the wampum belt that represented the Treat of One Dish with One Spoon and elaborated "we pray to have the same spirit, the same feelings that he [Kondiaronk] had, henceforth to be of one body, the same kettle" (Lytwyn, 1997). Based on the shared principle that land was to be shared rather than being perpetually, dominated by a single group (Glover, 2020), this Treaty emphasized that both powers agreed to share the hunting grounds as well as hold equal responsibility to take care and ensure their sustenance and cultural resources persisted (Simpson, 2008). The customs of long term decision making and only taking what one needed combined with their immense knowledge about ecosystem, community, and population dynamics helped them

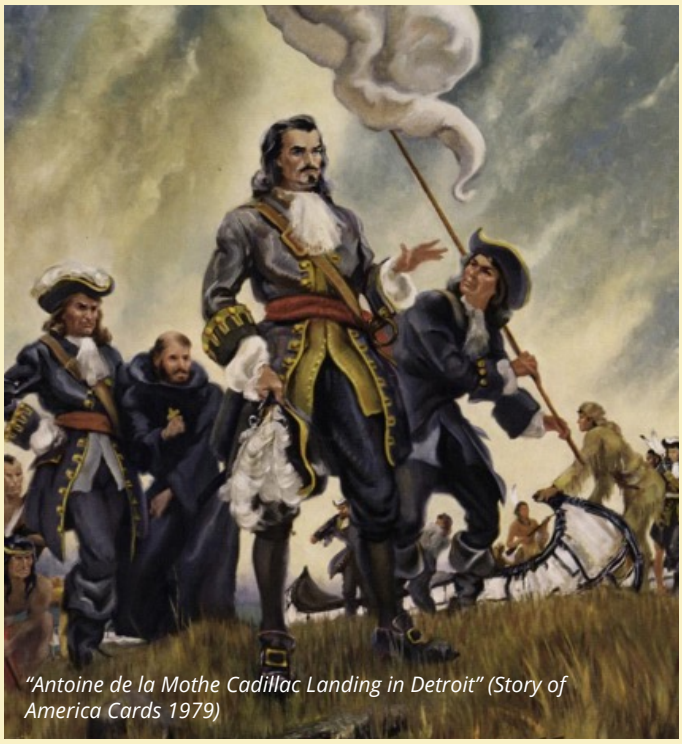
share the land without concerns of losing autonomy (Simpson, 2008). The Treaty of Montréal recognized and reinforced these agreements as it emphasized "whenever you shall meet each other [agree] to act as brothers and to agree as regards huntings, that no disturbance may occur, and this peace may not be troubled" (Lytwyn, 1997).

Despite agreeing to share the land with the Anishinaabeg and other Tribal nations as well as allowing the French to settle future-Detroit, the Haudenosaunee made a separate treaty with the English who promised to stop the expansion of French trade within the region (Belshaw, 2020). Furthermore, the English recognized and agreed to protect the Haudenosaunee's hunting and fishing rights within the region, providing a backup plan if the peace did not last with the French and their Indigenous allies (Lytwyn, 1997). Unsurprisingly, France did not recognize this treaty, and the lack of trust would foreshadow future colonial conflict. Until then,the French would continue to militaristically and economically assert their control of the Midwest for the next half-century as they expanded towards Louisiana.

The French Dynasty: Fort Pontchartrain Du Detroit

Historical Tension Spills Over and the French Final Stand (Early Half of the 1700s)

To increase stability in the region and better regulate the fur trade, the French created a center of trade with the hopes of it becoming a sort-of utopia for French settlers and Indigenous allies. However, the development of the multicultural society would resurface traditional feuds amongst Indigenous groups. Inter-cultural hatred would drive genocide and the spiral the



"Antoine de la Mothe Cadillac Landing in Detroit" (Story of America Cards 1979)

French and British into another war, resulting in the French abandoning the region and their Indigenous allies.

In preparation for English conflict, the French constructed forts throughout the Great Lakes region with the intention of offsetting and refuting any English advancements. Yet, shortly after the Great Peace of Montréal, the Ojibwe, Odawa, and other Indigenous nations soon began trading furs with the English, and Quebec requested the French Crown to allow trading in Michigan to preserve their allegiance (Sultzman, 1999).

"Mme. Cadillac arrives at Detroit: October 1701" (Thom, Robert A. 1964)

In 1701, Antoine de la Mothe Cadillac, a French commandant, received permission to establish a fortified settlement (Fort Pontchartrain du Detroit) that would serve as the region's center for water trade routes and as a safety hub for Indigenous peoples (Sewick, 2016; Figure 2.10.). Around 1702, bands of the Wyandot and Odawa moved near Fort Pontchartrain, the Miami Tribe arrived about a year after, and, shortly after, the Ojibwe and Mississauga arrived but settled at the head of Lake Saint Clair (Sewik, 2016). Despite Cadillac's best intentions, the newly settled Tribes would soon face tensions with one another. In 1706, the Odawa and Miami Tribes fought with one another, and both relocated elsewhere — the other side of the river and Ohio, respectively — within the following two years (Sewick, 2016). In 1707, Cadillac developed ribbon farms along the Detroit River to encourage French families to settle the area (Detroit Historical Society, n.d.).

In 1710, Cadillac, against the wishes of their allies, invited the Fox, Kickapoo, and Mascouten Tribes to return to Eastern Michigan. They returned to their original homeland in 1710, only to soon begin disputes with the already established Tribes (Sewik, 2016). Within a year or so, the French believed that the Fox were conspiring to gain permission from the Haudenosaunee to trade with the British (Sultzman, 1999). In the Spring of 1712, the Odawa and Bodéwadmi attacked the Mascouten in Southwest Michigan who then retreated to Fox in Detroit (Sultzman 1999). Inspired by hopes of gaining a favorable alliance with the British and control of their homelands, the Fox, Kickapoo, and Mascouten alliance fought the French in May of 1712 (The Michigan Legislature, 2001; Lambrou, 2021). Reinforcements made up of Wyandot, Ojibwe, Odawa, and Bodéwadmi warriors forced the Fox to flee. The French proceeded to chase them to the head of Lake St. Claire, where the French massacred over one-thousand Fox, Kickapoo, and Mascouten men, women, and children (Lambrou, 2021; Bemidji State University, n.d.). Survivors of the massacre retreated to Wisconsin. The Fox, Kickapoo, and Mascouten never again settled in Eastern Michigan. Although the Fox were now in Wisconsin and, later, Illinois, the

Figure 2.10. *Carte de la Louisiane et du cours du Mississipi (Map of Louisiana and the course of Mississippi (zoomed in). (L'isle 1718)*

Three Fires Confederacy — along with others who also hated the Fox people — aided the French in their genocidal campaign against the Fox throughout the next couple of decades, and they nearly eradicated Fox people (Sultzman, 1999; CPN Cultural Heritage Center, n.d.a).

After the Fox were removed from Michigan, Michigan remained relatively peaceful for the remainder of the first half of the eighteenth century. However, decades later, French and British conflict soon began to intensify around present-day Ohio. Between this time, the death of King Charles II — who had no children to take his place — sparked a dispute between the Austrian crown and the French crown to inherit the Spanish monarchy and its colonies (including Spanish Italy and Spanish Netherlands), which led to the War of Spanish Succession (Ogilvy, 2017). The coalition of Holland, England, and the Holy Roman Empire fought against the coalition of France, Spain, Portugal, and others, leading to Québec fighting both New England and Newfoundland along the Saint Lawrence River (Ogilvy, 2017).

In 1713, the Treaty of Utrecht ended the war, and the French conceded to recognize British control over the Hudson Bay Basin and Newfoundland (Sutherland, 2006; Figure 2.11.). Article 15 of the Treaty recognizes that the Haudenosaunee suzerain rights by emphasizing "the subjects of France inhabiting Canada, and others, shall hereafter give no hindrance or molestation to the five nations or cantons of [Haudenosaunee] Indians, subject to the dominion of Great Britain" (Chalmers, 1790). Additionally, Article 15 promotes a system of free trade since "on both sides [both subjects of France and subjects of England] shall enjoy full liberty of going and coming on account of

"Sauk and Fox Indians" (Bodmer, Karl 1833)

trade. As also the natives of those countries shall, with the same liberty, resort, as they please, to the British and French colonies, for promoting trade on one side and the other, without any molestation or hindrance, either on the part of the British subjects or of the French" (Chalmers, 1790). With the Haudenosaunee as a recognized part of the British Empire, the shared lands created a gray area of Imperial jurisdiction, especially since European powers believed that fixed boundaries were needed to separate sovereigns (Glover, 2020).

Figure 2.11. *North American British and French colonies in the 1700s (Schaetzl, n.d.c).*

For decades, both Empires claimed the Ohio River Valley as their own (The Editors of Encyclopaedia, 2022c), but they did not clash in the region since it was relatively uninhabited by colonial settlers. However, throughout the first half of the 1700s, British traders, with the permission of the Haudenosaunee, began to expand past the Appalachian Mountains into the Ohio Valley (The Editors of Encyclopaedia, 2022c).

In 1747, the Ohio company was formed to allow British trade to expand into the region (Griffith IV, n.d.). To assert their dominance, the French, in 1749, sent troops into the Ohio valley to threaten those affiliated with the Ohio company and pressure the local Indigenous Tribes to side with the French crown (Griffith IV, n.d.); The Editors of Encyclopaedia, 2022b), which are key violations of the Treaty of Utrecht. Both refused in order to continue to trade with the British. A year later, the French and their Indigenous allies slaughtered or captured every English-speaking individual within the region (The Editors of Encyclopaedia, 2022b). In 1754, to prevent British advancement, the French then constructed Fort Duquesne — later renamed Fort Pitt by the British (Griffith IV, n.d.; Schaetzl, n.d.b). Concurrently, both sides accumulated forces in the region.

The British gained the support of the Haudenosaunee, under the command of Tanaghrisson, and the French gained the support of otherwise-reluctant Tribes who refused to succumb to either British or Haudenosaunee expansion (Office of the Historian, n.d.a). In the same year, Lieutenant Colonel George Washington and Tanaghrisson led a militia of Virginians and Haudenosaunee to Fort Duquesne, but they managed to intercept and capture French Canadian Officer Joseph Coulon de Jumonville, killing almost a dozen Frenchmen whom the Haudenosauenee scalped during the skirmish (Griffith IV, n.d; Lengel 2005). Although a wounded Jumonville pleaded that they were on a diplomatic mission, Tanagrhisson exclaimed "Though are not dead, my father," then, out of personal hatred of the French, struck Jumonville's head with a hatchet and washed his hands with Jumonville's brainmatter (Lengel 2005; National Park Service 2020; Office of the Historian, n.d.a). Tanaghrisson later explained that he hated the French because they "had killed, boiled and eaten his father" when he was young (National Park Service 2020). This ambush would later be considered the first skirmish of the French and Indian war. To prepare for the eventual French retaliation, Washington and his troops constructed Fort Necessity, but Tanagrhisson and other Haudenoshounee leaders left early because Washington demanded to assert orders without listening to any of their advice (Griffith IV, n.d.; National Park Service 2020). Months later, the French and Indigenous allies captured Washington and burned the fort (The Editors of Encyclopaedia, 2022b), and they forced Washington to admit that he assassinated Jumonville (Griffith IV, n.d). Virginia then requested reinforcements from the British (The Editors of Encyclopaedia, 2022b). Learning of the coming British troops, the American colonies provided additional troops to aid Virginia (Office of the Historian, n.d.a). Because of the fur trade, conflict between nations, colonies, and Indigenous allies spread across the continent and the world.

"Allegory for the American Empire" (Giancola, Donato 2004)

The British Dynasty: Michigan's Final Crown

Indigenous Retaliation and Shifting Borders (3rd Quarter of the 1700s)

British exploitment of the region's Indigenous peoples would encourage them to resist the British Crown. This conflict's consequences would then inspire the American colonies to rebel against the British. This war divided long-lasting Indigenous alliances as some — with promises of British protection — sought to safeguard their lands from American expansion and others wished to overcome British Tyranny.

After years of fighting, on November 19, 1760, Detroit had been officially sworn over to the British (The Michigan Legislature, 2001), ending the French Dynasty. Over the next three years, tension between the local Indigenous Nations and the British would accumulate. The French and British relationships with the Indigenous Nations drastically differed. French interactions with Indigenous partners revolved around fair trade dealings and consistent gift giving, and this highlighted the French's acknowledgement and respect for the Tribes rightful control of territory and sovereignty (The Michigan Legislature, 2001). The French often learned the languages and cultures of the Indigenous peoples and intermarried with them (Low, 2015). Additionally, several Indigenous communities, including some Bodéwadmi, adopted the Catholic faith — which the Church of England opposed — and pledged their loyalty to the French crown (Pokagon, 1897). The British — believing Indigenous people had no other choice but to trade with them — limited gift giving of firearms, gunpowder, tobacco, and clothing, subjecting local Tribes as they pursued the fur trade (The Michigan Legislature, 2001).

Figure 2.12. *The British acquired the Midwest from France (Schaetzl, n.d.c).*

On February 10, 1763, Great Britain signed the Treaty of Paris. The Treaty declared Britain now had rights to all North American land east of the Mississippi River, and they also gained territories in India and the East Indies (The Editors of Encyclopaedia, 2022e). The American colonists were satisfied with the Treaty of Paris since they could now expand westward without fearing French retaliation, but the British, now in immense debt, no longer desired to maintain costly military influence within Western frontier (The Editors of Encyclopaedia, 2022e). The Indigenous Tribes in the former French territory, became wary of the future American Expansion, so they, under the Leadership of Odawa Chief Pontiac, prepared to unite to resist British rule (Ohio History Central, n.d.c). Each Tribe would then be responsible for taking over the nearest forts, then attacking British settlements (History.com Editors, 2021a; Figure 2.12.). In May 1763, Pontiac besieged Fort Detroit but was forced to withdraw by October, making Fort Detroit one of the few forts not to fall to the Indigenous forces (The Editors of the Encyclopaedia, 2022d; Figure 2.12.).

"Siege of Fort Detroit" (Remington, Frederick; year unknown)

In an attempt to prevent further escalation of war between Indigenous Tribes and American settlers, the British crown, on October 7, 1763, passed the Royal Proclamation of 1763 that restricted the territories of the American Colonies to the Appalachian Mountains and illegalized settlement to the west of this boundary (The Editors of Encyclopaedia, 2022e; Figure 2.12.). Although this Royal Proclamation formally incorporated the Western territories into the British Empire, it also recognized that the Indigenous peoples continued to hold title of the land (Indigenous Foundations, 2009). Despite their best efforts, the Declaration did not suffice Pontiac's forces. It also worsened British relations with the colonies as the latter claimed these territories as prizes of the French and Indian War and continued to settle them.

By the fall of 1764, Pontiac's rebellion began to fall apart as Wyandot, Odawa, Shawnee, and others surrendered in the Ohio and Pennsylvania theater (The Editors of the Encyclopaedia, 2022d). Skirmishes continued for two more years, but after failing to convince Tribes further West to join his cause, Pontiac signed a peace treaty with the British, ending Pontiac's war in 1766 (History.com Editors, 2021a). This is not to be considered a defeat, however, since the resistance persuaded the British to protect Indigenous rights. On October 17, 1768, the Treaty of Hard Labor drew the boundary, starting at Fort Stanwix, flowing Southwest down the Ohio River, then cutting modern-day West Virginia along the Kanawha River, and, finally, down to Florida (National Park Service, 2022; Figure 2.13.). However, on November 5, 1768, the Haudenosaunee — asserting that their strength gave them representation over the Three Fires Council, Shawnee, Wyandot, Cherokee, and other Nations — convinced the British to move the boundary line along the Ohio River and stop at Tennessee River (National Park Service, 2022; Figure 2.13.). The British would soon make adjustments to appease Indigenous Nations in the South, yet American settlers continued to illegally migrate West. Tribal nations that did not consent to the Treaties resisted American migration. The Colonists will soon revolt to, in part, claim the land the Crown promised them.

To help recover from the economic burden of the French and Indian War, Britain passed several taxes onto the American Colonies, which would serve as

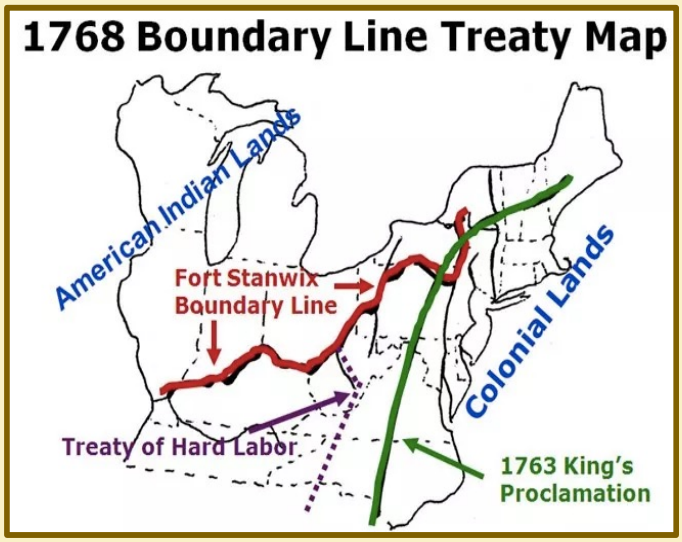


Figure 2.13. *Shifting boundaries of the American colonies (National Park Service 2022).*

"Change of Seasons" (White, Bryan year unknown)

the final straw for the American Colonists. Previously, the British had previously given Pontiac's forces about 60,000 pounds worth of supplies at the end of the war (McDonnell, 2016). The Stamps Act — which started American protests and "No taxation without representation" — sought to raise about 60,000 pounds of taxes (McDonnell, 2016; NCC Staff, 2022). Although this act would later be repealed, the momentum for liberation had been set. The idea of an upcoming revolution by the Colonies worried the Indigenous Nations of the West because, if the British were defeated, there would be no one to aid the Tribes in repelling the inevitable waves of settlers. For this reason, Haudenosaunee, Shawnee, Cherokee, Ojibwe, and other forces would fight along the British during the American Revolution (Nations at War, 2020a; Ohio History Central, n.d.b).

To encourage Tribal invasions in Western theater of Ohio and Kentucky, the Quebec Lieutenant Governor, Henry Hamilton, paid for scalps that were brought to Detroit (The Michigan Legislature, 2001). Despite the British's best efforts, many Tribal forces split, as some decided to fight alongside the Americans. For example, the Seneca and Oneida Tribes of the Haudenosaunee Confederacy joined the Americans early in the Revolution, creating a non-negotiable split with those allied to the British, and thus, formally ending the Haudenosaunee Confederacy (Brooks, 2017). Additionally, in 1778, a Virginian officer reached Illinois and convinced two local Bodéwadmi Chiefs, Siggenauk and Naakewoin, to fight alongside the Americans (Milwaukee Public Museum, n.d.c). These Chiefs proceeded to encourage other Tribes to jointly attack the British in Southwest Michigan (Milwaukee Public Museum, n.d.c). In the same year, the French formally allied with the Americans to secure future trade opportunities, as well recover the land and prestige they had previously lost (George, 2018). However, French involvement would almost bankrupt the nation, heavily motivating the 1789 French Revolution (The Editors of the Encyclopaedia, 2022c).

After years of fighting against the Colonies and their French and Spanish allies, General Cornwallis surrendered at the Battle of Yorktown on October 19, 1781 and the British parliament passed a bill to make peace with the Americans (American Battlefield Trust, n.d.). However, battles were still occurring on the Western front, past Appalachia. On August 19, 1782, Ojibwe, Odawa, Shawnee, Wyandot, and other Tribal forces, alongside the British, defeated the Kentucky militia. This was considered to be the final

"Indian Attack on the Village of Saint Louis 1780" (Berninghaus, Oscar Edward 1920); Photo: Wilson, Richard Guy

British victory of the Revolution (Library of Congress, n.d.a). With the end of the Revolutionary War, the British were willing to grant generous demands to the Americans in hopes of gaining them as a trading partner (History.com Editors, 2019). In the 1783 Treaty of Paris, the United States was given all land East of the Mississippi River, with only a few disputes in the South, and the States agreed to resolve its British debts and fairly treat loyalists (National Geographic Society, 2002). After emphasizing that the Americans failed to pay back pre-war debts and compensate loyalists for losses during the Revolution, the British refused to leave Michigan to control the fur trade and continued to supply their Indigenous allies to attack settlers in the Ohio alley (The Michigan Legislature, 2001). Despite not having the forces to protect its citizens in the region, the American government continued to sell land titles to settlers to both gain funds and use the settlers as cannon fodder to assert their control of the region (CPN Public Information Office, 2019).

The Yankee Dynasty: Trail Of Broken Promises

Post-Revolutionary War and the War of 1812
(late 1700s through early 1800s)

After acquiring the territories west of the Appalachian Mountains, the United States' inability to form a legitimate treaty that satisfied all Tribes led to a continuation of settler-Tribal disputes. These conflicts would cascade into an Indigenous-led, British-supported conflict against advancing Americans in the region. Later on, European conflict would encourage the Americans to attack the British-Tribal alliance, emboldening American expansion and smothering the Indigenous resistance.

Despite the British presence, waves of American settlers continued to settle in the Midwest. With the 1784 Treaty of Fort Stanwix, Americans forced the Haudenosaunee to transfer all lands in New York, Pennsylvania, and the Midwest — the Haudenosaunee did not control the latter two — to the United States despite the latter two's respective Tribal Nations not being present (Beaver Area Heritage Foundation, n.d.). The Tribal Nations of the Ohio Valley protested against this treaty since they claimed that the Haudenosaunee could not give away land they did not control, but American settlement accelerated as they were emboldened by the faulty Treaty, further increasing conflict between Indigenous peoples and settlers (Hurt and Richter, n.d).

In an attempt to resolve these disputes, the United States and Tribes from the Wyandot, Ojibwe, Odawa, and Delaware Nations signed the 1785 Treaty of Fort McIntosh which gave Southern and Eastern Ohio to the United States, but it made Northwestern Ohio an Indian Reservation (Ohio History Central, n.d.f.; Figure 2.14.). The treaty also gave the United States reserved access to Detroit and territory up to six miles from the strait, and the people of the reservation acquired the right to punish illegal American settlers (Beaver Area Heritage Foundation, n.d.). Just as before, other Tribal Nations who were not invited to discuss the Treaty of Fort McIntosh claimed that the invited Tribes had no right to secede land without their consent (Ohio History Central, n.d.f). Despite the United States assuring to limit migration, many American colonists continued to settle into the reservation areas (Ohio History Central, n.d.f). Additionally, Tribes who did not acknowledge the Treaty of Fort McIntosh continued to attack Americans who settled south of the Treaty line (Ohio History Central, n.d.d).

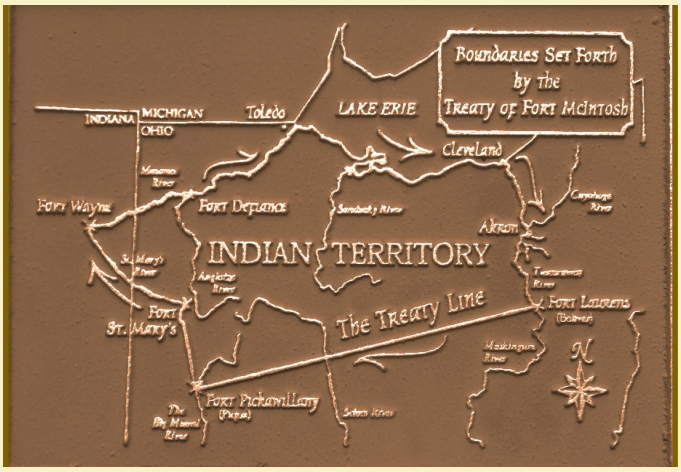


Figure 2.14. *Plaque (recolored) detailing the Ohio Indian Reservation (to the Northwest) along with key sites (Remarkable Ohio 2005, altered).*

Because of the increasing level of American settlements, the Northwest Confederacy (NWC), under the leadership of Miami Chief Little Turtle, united the Miami, Shawnee, Bodéwadmi, Shawnee, Haudenosaunee and other Tribal Nations to protect their territories (CPN Public Information Office 2019). In another attempt to resolve conflict in the region, the US threatened the Wyandot, Ojibwe, Odawa, Bodéwadmi, Delaware, and Sauk Nations to sign the 1789 Treaty of Fort Harmar that reinforced the boundary line that the Treaty of McIntosh instated (Ohio History Central, n.d.d). However, many Tribal Nations that were not invited asserted that the invited Tribes did not represent them and continued to defend their territories south of the Treaty line from American settlement (Ohio History Central, n.d.d). In 1790, George Washington, in hopes of dissolving the Northwestern Confederacy, sent untrained recruits to conquer the capital of the Miami nation near present-day Fort Wayne (northwest of the Treaty Line), yet Northwest Confederacy forces easily defeated them (CPN Public Information Office, 2019). Both sides perceived the other of violating the Treaties, leading to warfare once again.

During the following battles, the British helped supply the firepower of the Northwest Confederacy. In 1792, because their militias suffered immense casualty rates at the Battle of the Wabash River, Congress scaled up, reorganized, and trained a US legion under the leadership of Anthony "Mad" Wayne (Hudson, 2022). Under his command, the legion advanced into Ohio territory. The legion's victories worried Little Turtle, who considered making peace with the US, but other leaders of the Northwest Confederacy did not agree (Hudson, 2022). On August 20, 1794, the Battle of Fallen Timbers —near modern-day Toledo — had arrived (CPN Public Information Office, 2019). The American Legion of about 3,300 troops collided with 1,400 troops from the Shawnee, Miami, Wyandot, Haudenosaunee, Ojibwe, Odawa, Bodéwadmi, and Lenape Nations as well as a few British troops (Hudson, 2022; CPN Public Information Office, 2019). In less than an hour, the Northwestern Confederacy forces, after being outmaneuvered, retreated to the British Fort Miamis; the British refused to let them in, forcing them to scatter (Hudson, 2022). Following this defeat, the United States, Britain and various Tribes signed Jay's Treaty of 1794 and the 1795 Treaty of Greenville.

Figure 2.15. *The Northwest Confederacy ambushes General Arthur St. Clair. (Winkler, 2011).*

Figure 2.16. *American soldiers charging towards Northwest Confederacy forces. (Winkler, 2013).*

With Jay's Treaty, the British agreed to leave the Midwest and recognize the ownership of the United States, as stated in the 1783 Treaty of Paris (Office of the Historian, n.d.b). The 1795 Treaty of Fort Greenville — signed by the Ojibwe, Odawa, Bodéwadmi, Miami, Wyandot, Kickapoo and other Tribal Nations — formally seceded Southern and Eastern Ohio as well as Detroit and Fort Mackinac to the United States, granted the Indigenous Nations the power to punish illegal settlers who passed the Greenville Treaty Line, and required the US government to protect the Tribal lands from American settlers and Europeans — all of which reinforced agreements from previous Treaties (Clarke Historical Library, n.d.; Figure 2.17). Adding to the list of rights and responsibilities, the Treaty of Greenville required that Indigenous lands could only be sold to the US government and that Indigenous Tribes were under the sole protection of the United States and no other power (Clarke Historical Library, n.d.), meaning Tribal nations were not allowed to work with any foreign power. Furthermore, that Indigenous nations were to notify the United States about any arising Indigenous hostility as well as prevent their members from joining any resistance (Clarke Historical Library, n.d.).

Despite the demands of the Treaty of Greenville, it also solidified that the Indigenous peoples had the right to hunt in the ceded territory without interference from the United States as long as they were peaceful (Clarke Historical Library, n.d.). Even though the Treaty was an attempt for peace, the massive levels of immigration forced the relocation of Indigenous peoples from the ceded territories, and this resulted in additional clashes and village massacres at the hands of the Americans (Hemenway, 2015). In 1805, Thomas Jefferson approved of Michigan becoming a separate territory with Detroit as its capital (The Michigan Legislature, 2001), revealing the Americans' intentions of breaking the Treaty of Greenville. Yet, Indigenous forces will soon do so as well.

Figure 2.17. *Signatures and Clan symbols on the 1795 Treaty of Greenville (Clarke Historical Library, n.d.).*

During the Napoleonic wars (1803-1815), the British aided other European monarchies in resisting Napoleon Bonapartes' imperial expansion in Europe (New World Encyclopedia Contributors, 2022c). Prior to the Napoleonic Wars, France underwent mass rebellion that led to the formation of a Republic that Napoleon would later seize to form the French Empire (see "The Overthrowing of the French Crown" on the following page). Throughout the war, various coalitions of monarchy nations — Great Britain being the only constant member —pursued to defeat Bonaparte and reinstate the French monarchy (New World Encyclopedia Contributors, 2022c). Shortly after Napoleon's rise, France, in 1802, gained control of the Louisiana Territory from Spain, threatening American westward expansion (Office of the Historian, n.d.c). However, in 1803, Napoleon — after a failed attempt to quell the Haitian Revolution — sold the Louisiana Territory to the United States to focus his efforts on fighting the British in Europe rather than maintaining French colonies in the Americas (Office of the Historian, n.d.c). French Louisiana's Indigenous populations did not have a say in the sale, and the land acquisition further emboldened American Manifest Destiny as American colonists expanded to settle and reinforce ownership of these purchased lands. Now, American sentiment not only deemed the Indigenous nations in the modern "Midwest" and "South" as illegal occupiers, but also as active barriers to accessing the territories of the "Great Plains."

In 1806 and 1807, France and Great Britain, respectively, outlawed any neutral trade with the other side, enforcing trade blockades and seizures of trading ships (Office of the Historian, n.d.d). The British would soon begin to force American sailors to serve the British navy (History.com Editors, 2021b). Additionally, the British continued to supply Indigenous raids on the American frontier (American Battlefield Trust, 2017). After two failed embargo a\ ttempts from 1807 to 1809, the United States passed a bill to trade with whichever side first stopped blockading American goods and restrict trade to the other, an offer that Bonaparte accepted (History.com Editors, 2021b). This then convinced Great Britain to reject the Americans' claims of neutrality. Soon after, the United States soon began to favor war as a possible attempt to gain the British and Spanish colonies as rewards through conquest (Office of the Historian, n.d.d), just as they had done in the French and Indian War. The United States knew that it could not defeat Great Britain's navy, so it decided to conduct a land-war with the vastly outnumbered Canadian colony and, in 1812, declared war against the British Empire (USS Constitution Museum, n.d.). Napoleon's forces soon suffered from their failed invasion of Russia, allowing the British to focus more effort to blockade the Atlantic coast (Christie, 2015).

Figure 2.18. *US Territory gains from the Treaty of Greenville (Straits of Mackinac not shown) (Tindall and Shi 2013).*

Prior to the declaration of war, the Shawnee, led by Tecumseh and Tenskwatawa (the Prophet), began to form the inter-tribal Seventeen Fires Confederacy to resist American expansion into the Northwest Territory (Heidler and Heidler, 2022). In 1806, Tenskwatawa's messaging about spiritual, sacred reformation through the rejection of Colonial culture — along with his accurate prediction of a solar eclipse and Tecumseh's charisma — would encourage many Tribes to join them in modern-day Indiana to begin recovering their culture and lands for a better future (History.com Editors, 2022a; Deloria, 2020). Despite failing to convince many Southern Tribes to join his cause, Tecumseh convinced Midwest Tribes to resolve traditional tensions and unified the Shawnee, Delaware, Ojibwe, Odawa, Bodéwadmi, Wyandot, Sauk, Kickapoo, and other Tribes (Deloria, 2020). Governor Hull of Michigan soon heard rumors of another Indigenous resistance force and began to prepare militia forces at Detroit (Boles, n.d.).

As both sides prepared for another conflict, the United States was further expanding into the 1795 Reservation territory through negotiations. For example, in 1805, the Ojibwe, Odawa, Bodéwadmi, Wyandot, Shawnee, and other Tribes signed the Treaty of Fort Industry, and they transferred control of the Western Connecticut Reserve — moving the Reservation border about an additional sixty miles west from Pennsylvania (near doubling the distance) — in exchange for a financial compensation and the retention of hunting and fishing rights (Ohio History Central, n.d.e); (Wooster Digital History Project, n.d.). In 1807, the Ojibwe, Odawa, Bodéwadmi, and Wyandot nations ceded lands that would make up Southeast

The Overthrowing of the French Crown

As the Americans and the Northwest Confederacy clashed, an American-inspired revolution spread across France. In 1787, the French crown attempted to tax French aristocrats to pay off its debts (enhanced by the American Revolution), leading to nationwide reforms to improve aristocratic and commoner representation in government (The Editors of the Encyclopaedia, 2022c). Fearing that the Crown and the aristocracy would work together to circumvent commoner power, Parisians, in 1789, began an insurrection by seizing the Bastille fortress and its armory (History.com Editors, 2022b). This began the French revolution and inspired peasant revolts throughout the nation to overthrow the feudal system (History.com Editors, 2022b). After becoming a constitutional monarchy in 1791, France, in 1792, sought to spread French revolutionary values and prevent foreign interference by declaring war on Austria and Prussia (History.com Editors, 2022b). Months later, the Monarchical armies, in the Brunswick Manifesto, threatened to harm the Parisians if they harmed the French Royal Family (New World Encyclopedia Contributors 2022b). Soon after, French revolutionaries arrested the French King for conspiracy with France's enemies and established the Republic of France — both bolstering French nationalism and increased army recruitment (The Editors of the Encyclopaedia, 2022c). On January 17, 1793, the Republic condemned the French King to death for treason against the French people, putting him to death by guillotine days later (New World Encyclopedia Contributors, 2022b).

The execution then encouraged Great Britain, Spain, and other European monarchies to side with Austria and Prussia, leading to France losing much of its Northeastern territory (The Editors of the Encyclopaedia, 2022c; New World Encyclopaedia Contributors, 2022c). Later in June, the French Reign of Terror would begin leading to the executions of over 17,000 people who were convicted of being enemies of the French revolution (New World Encyclopedia Contributors, 2022b). In retaliation against the regime, an opposing government faction, in 1795, created a bicameral legislature with an executive directory (History.com Editors, 2022b). Royalists and counter revolutionaries soon began their own uprisings to counter the new government, but the French army, led by General Napoleon Bonaparte, quelled this attempt as well as silenced radical revolutionaries (The Editors of the Encyclopaedia, 2022c; History.com Editors, 2022b). In 1797, the French defeated Prussia and Austria, and took control of Austrian Netherlands and established puppet-states in Northern Italy, leaving Great Britain to be the leading challenger to French expansion (New World Encyclopaedia Contributors, 2022c). On November 9, 1799, Bonaparte led a military coup and appointed himself as the executive leader of France — later as the French Emperor in 1804— (New World Encyclopedia Contributors, 2022b), and the imperial state focused its efforts on dominating Europe.

Michigan and Northwest Ohio in exchange for financial payment, retaining fishing and hunting rights (Clarke Historical Library, n.d.; Figure 2.19). However, the Treaty explicitly re-emphasized that these nations were under the sole protection of the United States and of no other power as well as that these continued protections remained as long as the Indigenous Nations "will prove by their conduct that they are worthy of so great a blessing" (Clarke Historical Library, n.d.). Soon after, in 1808, the Treaty of Brownstown, the Ojibwe, Odawa, Bodéwadmi, Wyandot, and Shawnee transferred a relatively narrow track of land that connected the ceded territories of the Treaty of Detroit with those of the Treaty of Fort Industry; this then allowed the Americans to build a main road to facilitate the settlement and development of Detroit. The Americans' continued advancement troubled the Indigenous alliance as they worried that the United States would continue to attempt to Tribes to sign coercive treaties and give up their land until the Americans fully displaced them.

In 1811, to prevent the further recruitment of Indigenous people into the Confederacy, Governor William H. Harrison of the Indiana territory led American forces to the Tribal encampment in hopes of negotiating (Andrews, 2018). By this time, modern-day Indiana was split with the Americans owning much of the Hills and Lowlands and the Confederacy mainly controlling the plains. The morning after Harrison's arrival and heated discussion, Tenskwatawa led an ambush against the American forces, but the Americans successfully repelled them, allowing Harrison to burn their encampment (Andrews, 2018). This loss at Tippecanoe encouraged Tecumseh to seek an alliance with the British in hopes

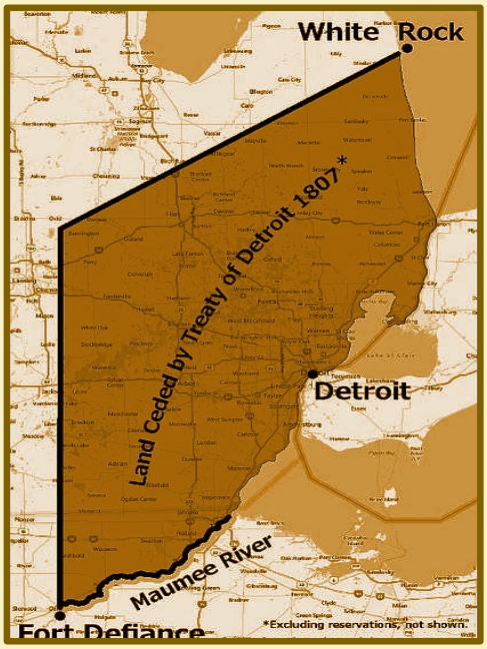


Figure 2.19. *Ceded territories of Treaty of Detroit expand both modern-day Michigan and Ohio; Reservations and ceded territory from Treaty of Greenville are not shown (Sewick 2016, altered).*

they would recognize a sovereign, Indigenous state in future negotiations (History.com Editors, 2021b). Consequently, the signatory Tribes of the Treaty of Detroit and Treaty of Greenville violated their respective Treaties as they sought protection from the British to conspire against the United States. This convinced Americans that they could only resolve the "Indian problem" if they first removed the British from Canada (Heidler and Heidler, 2022).


"Battle of Tippecanoe" (Kurz and Allison 1889)

A series of conflicts lead to the end of the last large-scale indigenous alliance in the region. In July of 1812, the British-Tribal alliance captured Fort Mackinac through a surprise attack (The Michigan Legislature, 2001). A month later, they would do so once again as the alliance sieged Detroit, forcing Governor Hull to surrender, making Detroit the only American city to ever be surrendered to a foreign power (The Michigan Legislature, 2001). The British-Tribal alliance then focused efforts on raiding American settlers across modern-day Indiana and Illinois and assisted in the invasion of Ohio (American Battlefield Trust, 2017; History.com Editors, 2022a).

Figure 2.20. *Great Lakes battles in the War of 1812 (Christie, 2015).*

In January of 1813, the first American attempt to retake Detroit failed at Frenchtown, and some Indigenous warriors killed American prisoners, which became a rallying cry for Americans until the last battles of the war (American Battlefield Trust, 2017; Figure 2.20.). After the Americans failed to advance to Montréal, they focused their efforts on the Western Theater, leading to an American naval victory near Put-in-Bay in September (Heidler and Heidler, 2022; Figure 2.20.). The British-Tribal alliance abandoned Detroit and retreated towards Ontario with Americans in pursuit (The Editors of the Encyclopaedia, 2022a).

However, Tecumseh was reluctant since he was skeptical of the British loyalty and vigor, and he believed their retreat would leave Tribes west of Detroit vulnerable to the Americans (Christie, 2015). In October, the Inter-Tribal Confederacy would make its final stand at Moraviantown. Tecsumeh died in battle, and the Inter-Tribal Confederacy disbanded and most ceased allegiance with the British (The Editors of the Encyclopaedia, 2022a). No other large-scale Indigenous alliance within the MidWest region would rise again to resist for their sovereignty.

After securing the Northwest territory, the Americans focused their efforts on the Eastern front, leading to the final disempowering of the region's Indigenous Tribes as fully sovereign. The timing was crucial because, within a few months, the defeat and eleven-month exile of Bonaparte allowed the British to increase the level of troops on the American front (USS Constitution Museum, n.d.). After several more skirmishes and the burning of the Whitehouse, the two powers arrived at a stalemate. To ease the negotiation process, the British abandoned demands to establish an Indigenous buffer state between British Canada and the United States, once again betraying the Indigenous Tribes (Heidler and Heidler, 2022). The British finally accepted American sovereignty, and the Americans ceased their desire to acquire Canada. However, the Americans gained a new sense of patriotism that further motivated American Manifest Destiny into the Western territories (History.com Editors, 2021b). No longer having access to British aid, the Indigenous Tribes in the Midwest could no longer repel the massive waves of American immigration (American Battlefield Trust, 2017). Additionally, the war created many divisions within Tribes in the South. The Creek were split

"Death of Tecumseh" (Costaggini, Filipo 1877); Photo: Architect of the Capitol, recolored

as some factions, inspired by Tecumseh, attacked American forts while other factions actively fought them, and the Choctaw soon divided with many joining the American army to put down those who joined the revolting Creek (Schilling 2022, O'Brien 2017). In August 1813, rebel Creek factions took over Fort Mims in Southwest Alabama and massacred both white settlers and Creek sympathizers, so Major General Andrew Jackson led a militia of American, Cherokee, and Creek soldiers to decimate Creek villages sympathetic to the rebellion (Schilling 2022, O'Brien 2017). Their victory in the War of 1812 made Americans realize that they no longer had to negotiate with Tribes because the United States simply outgunned them, and this encouraged future American leaders to pursue oppressive and expulsionary policies against Tribes.

"Trail of Tears" (Lindneux, Robert 1942)

CONCLUSIONS AND NEXT STEPS

In this chapter we have provided key information and guidance on historical indigenous and settler fire practices, Anishinaabeg social structures, sovereignty, rights, cultures, knowledges, and history, all with the aim of increasing understanding and appreciation that can lead toward cooperating with Tribal partners in a good way, avoiding misunderstanding, exploitation, or appropriation. We conclude with several key deliverables informed by the content of this chapter: key lessons and paths to partnerships, a completed Fire Acknowledgement statement, an infographic that can be used for communication of the historical use of fire and key takeaways for Tribal collaboration (Appendix A), and an Annotated Bibliography for Tribal Outreach Guide (Appendix C) for further study. We also provide alternate forms of this chapter's content that can be shared to inform others specifically on traditional knowledges (Appendix D) and indigenous history (Appendix E).

Key Lessons

Traditional vs. Prescribed Burning: Traditional, cultural burning allowed for the increase and cultivation of cultural resources and subsistence uses. Fire is provided as a gift from the creator to help maintain balance within Indigenous landscapes. In contrast, when Western contemporary practitioners conduct prescribed or controlled burning practices, they prioritize the restoration and preservation of ecosystems with little focus on historical cultural values of burning.

Tribal Diversity: By understanding the diversity and intersectionality of Tribes — such as the Nations, Tribes, and Clans — those who reach out can better display respect and appreciation for the Tribe as well as limit the overrepresentation of a distinct entity when gathering and interpreting Indigenous knowledges. Traditional knowledges are not a monolith, even within the same societal level.

Sovereignty: Historical, moral, and legal arguments support the autonomy of Indigenous peoples and communities as well as reinforce their right to seek partnerships in the conservation of their ceded lands. When working with Tribes, Western practitioners should pursue *free, prior, informed consent* to respect Tribal entities and avoid further exploitation.

Holistic Epistemologies: Traditional Knowledges are informed by ecological, spiritual, and cultural lenses that cannot be separated from one another. Additionally, all three intertwine with one another to promote a kin-centric philosophy that emphasizes that civilization and landscape of a place must become intertwined to ensure both persist in the long run.

History: The relationships between Indigenous societies, Colonial powers, and the land are multifaceted, and one should avoid promoting a homogeneous history for either party. Additionally, one should remember that there are no dichotomies of “good vs. evil” or “savage vs. civilized,” and that there are no absolutes in history. Just as the oppressor can often become a victim and the victim can also be an oppressor. Overcoming these short-sighted, simplifications of history is essential to decolonizing narratives and overcoming stereotypes about Indigenous peoples.

Following Paths

Get to Know your Neighbors: Reach out to nearby Tribes and establish a connection. Do not start off by stating you need help with a project. Instead, state that you are interested in forming a partnership then meet with them on several occasions about non-project related events. As appropriate, participate in community events and cultural activities to better understand their way of life and their values. Overtime, you will gain their trust and establish a key friendship between them and the organization as well as yourself.

Comprehend Cultural Narratives: Indigenous peoples often hold their folklore close to their identity, and these folklore reflect key values and perspectives of the respective Indigenous community. For further reading, "The Mishomis Book" — by Edward Benton-Banai (Ojibwe) — artistically presents Ojibwe stories, such as the Creation story, the Great Flood, the formation of the Clan system, the prophecies of the Seven Fires, and other key narratives.

Living Indigenous Values: Many Anishinaabeg and Indigenous peoples of other Tribal nations subscribe to the Seven Grandfather teachings which espouse the values of Love, Respect, Bravery, Honesty, Humility, Wisdom, and Truth (source; source). These teachings provide a solid foundation for understanding how to work with others in a good way. However, the Grandfather teachings argue that one must improve in all seven values, as they are all interdependent. Additionally, the Grandfather teachings argue that one must learn to practice these values in their daily journeys. You either live them or you do not, there is no in between. For further reading, learn more about the Grandfather teachings and other teachings for personal development from "Think Indigenous: Native American Spirituality for a Modern World" by Doug Good Feather.

Acknowledgements: The purpose of an acknowledgement is to come to terms with one's mistakes and actively voice their intent to address them. An admission of wrongdoing is paired with the acceptance that one lacks control of the situation and needs guidance, allowing oneself to be vulnerable. One must then be prepared to accept and pursue the responsibilities necessary to amend the situation at hand. One should finally display gratitude for the gifts they have, hope to grow beyond one's mistakes, and trust in others to help fulfill the vision. Without these elements, an acknowledgement can come across as shallow, self-serving or non-inspiring, even if made with the best of intentions. For example, entities often emphasize previous wrongdoings (such as " I recognize Americans took this land from X Tribe(s) in unfair exchange...") without offering any desire or pathways to remedy said wrongdoings. Land Acknowledgements are increasingly being used as an official form of acknowledgement appearing on entity websites or outreach materials. Similarly, a Fire Acknowledgement, though not at present widely used, can be an important way to acknowledge the history of a *practice* currently being used by Western practitioners, but with a need for recognition of indigenous history and connection. Based on our research, we have drafted the following Fire Acknowledgement as a starting point:

SHKODÉ (FIRE) ACKNOWLEDGEMENT

We acknowledge the Anishinaabeg and other Indigenous peoples are the original stewards of *shkodé* (shkoh-deh), having used *shkodé* for thousands of years. With *shkodé*, they shaped the landscape by selectively applying fire to different habitats, promoting the cycle of destruction and rebirth. *Shkodé* helped many of Indigenous peoples to hunt game, control pests, develop and maintain trails, and promote the presence and harvest of desirable vegetation, such as medicinal plants and cultural foods.

After the Settlers expelled most of the Anishinaabeg from the region, the presence of intentional *shkodé* in the landscape plummeted and was further stopped through fire suppression policies. The severe absence of *shkodé* and the failure of our ancestral compatriots to recognize the importance of *shkodé* and ki's original stewards, allowed vegetation to build up over the decades; this is largely responsible for increased wildfire occurrence and intensity, and the loss of many fire-dependent ecosystems, including prairies and oak-savannas.

We accept that our historical fear of *shkodé* and our detachment from ki has made us forget how to use *shkodé* as medicine, and although we are relearning, we remain ignorant. We are now grateful for the gift of pyro-medicine, and we desire to build a better friendship with *shkodé* to better understand the influence ki has on different ecosystems and biotic communities. However, we admit we require guidance and wisdom to restore *shkodé* in a good way.

We acknowledge that we are responsible for collaborating with Tribes, the original healers to whom we are neighbors, to advance the return of *shkodé* to our landscapes to help restore the fire-dependent ecosystems that we admire and enjoy. In this endeavor, we hope to establish and maintain mutually beneficial relationships with Tribes, built on kinship and trust, to envision a collective, equitable, and inclusive return of *shkodé* to our shared landscape, all while ensuring we respect and appreciate their rights, knowledges, and cultures. Together, *shkodé* will return.

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CHAPTER 3: COMMUNICATION AND ENGAGEMENT PLANNING FOR FIRE MANAGERS

PURPOSE AND AUDIENCE

The development of prescribed burn programs by Michigan land managers is increasing as fire is used more widely as a tool for achieving ecological restoration and fuel management on the landscape. However, fire differs from other tools due to its complex behavior and historical use and management by humans. This requires fire practitioners (those trained in applying prescribed fire) and fire managers (those operationalizing a prescribed fire program) to have a deep understanding of how to use fire for stewardship goals and collaborate with diverse stakeholders, community groups, and Indigenous Tribes to carry out its application safely and justly. For non-profit organizations that depend on the support of community members, it is also essential for prescribed burn programs to establish community engagement strategies to promote public understanding and acceptance of the usefulness of fire. Failure to establish good communication practices within a burn program can result in backlash, misinformation, and program ineffectiveness. This chapter will focus on the importance of developing a communications plan within a burn program, as well as outline with whom and how an organization can engage. Throughout, we provide recommendations and valuable communication resources and products for the Southeast Michigan Land Conservancy (SMLC; see Chapter 1: Introduction to Prescribed Burning...) that can also serve as a model for other fire practitioners and agencies.

WHAT EFFECTS PUBLIC PERCEPTIONS OF PRESCRIBED FIRE?

While prescribed fire is not a new practice, the public's perception of fire varies due to a complex history of fire use, suppression, and education. As discussed in Chapter 2, the dispossession of Indigenous lands and prejudice towards indigenous knowledge and cultural practices by European colonizers since their arrival to North America directly resulted in a shift towards less fire use, increased fuel buildup, and more frequent and catastrophic wildfires. Fires that get out of control can be dangerous and costly, having the potential to cause loss of lives and infrastructure, and these high profile events have fueled public fear and skepticism around prescribed burning (Ryan et al., 2013). The government has also promoted negative perceptions of fire through public policy and educational initiatives to suppress fire, most notably the "Smokey Bear" campaign (Ryan et al., 2013). Since Western science has historically delegitimized traditional ecological knowledge, much of society has not learned that fire is a natural part of the landscape and has been used by native peoples for millennia to promote biodiversity. Many people thus lack the understanding that prescribed burning restores fire-dependent ecosystems and reduces the risks for wildfire. It seems that today we have a public that is cautious, concerned, and not confident in seeing fire returned to the landscape; yet their understanding and support are critical for improving widespread prescribed burn implementation through their collective influence on funding, policy, advocacy, and application. So, how do we shift and reshape public perceptions to increase fire acceptance?

Central Factors

Four central factors have been found to influence public approval of prescribed fire: smoke, control, trust, and knowledge (S. M. McCaffrey, 2006). *Smoke* is undoubtedly an air quality and health concern for many, especially those with respiratory issues. Therefore, adequate smoke management plans and communication before scheduled burns are necessary to ensure minimal smoke exposure and address individual smoke concerns. Smoke that is produced from medium-severity controlled burns is much less severe than smoke produced by wildfires (Figure 3.1). Educating the public on this difference can be a helpful tactic for reducing people's concerns of smoke (McCaffrey & Olsen, 2012). *Control*, the belief that those applying fire to the landscape have the expertise to manage its spread safely, is another critical factor that influences public approval of prescribed burning. While the majority of prescribed burns are safe, the few that spread beyond intended boundaries receive far more media attention than those that are successful (McCaffrey, 2006; Ryan et al., 2013). *Trust* in the agency that is administering fire also greatly affects public attitudes; in Michigan, only 27% of people polled reported having trust in the government to make proper decisions for the use of fire, and only 10% strongly approved of prescribed burning, suggesting that trust is somewhat linked with public approval (Winter et al., 2001). Finally, *knowledge* surrounding the benefits of fire and familiarity with the practice of burning are crucial determinants for shaping public perception. Out of 7 states surveyed, Michigan respondents residing in the wildland urban interface held some of the most negative views towards prescribed burn outcomes on public lands. This was primarily attributed to their insufficient

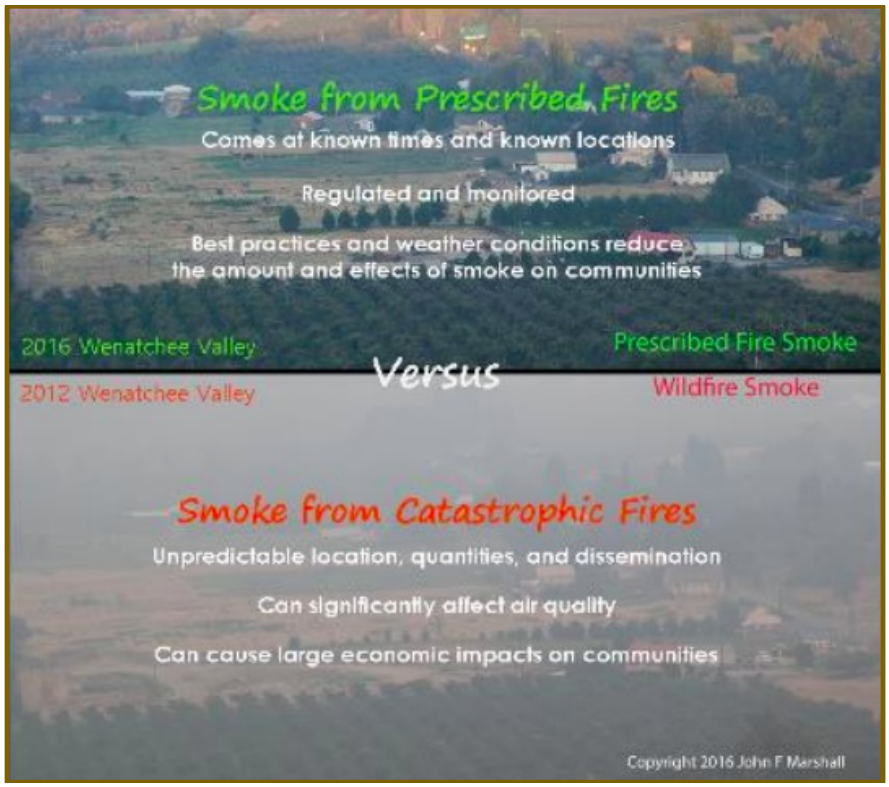

Figure 3.1 *Communication about smoke sourced from prescribed fires vs. wildfires, provided by Chumstick Wildfire Stewardship Coalition.*

understanding of fire practices, as well as a lack of confidence in the agency (the US Forest Service) using fire (Toman et al., 2014).

Applications For Communication Planning

Fire managers can promote practices that strategically address the key factors of smoke, control, trust, and knowledge to improve public perceptions of fire and increase support for prescribed burning. Educational efforts that increase stakeholder and community engagement and relationship-building need to be at the heart of these endeavors. When people have knowledge and understanding of fire ecology, they tend to be highly supportive of agencies using fire as a management tool (S. McCaffrey & Olsen, 2012). One case study in Florida found that providing basic educational information to the public increased support for prescribed fire by over 20%, from 64% acceptance to 87% acceptance (Loomis et al., 2001). Therefore, increasing access to educational information and resources for those with less understanding could improve knowledge levels and support for prescribed fire. Additionally, increasing the public's confidence in fire managers' ability to carry out controlled burns safely can be achieved through public engagement, including citizens in the process, and publicizing successful controlled burns using a variety of media platforms. Having interactive spaces available to hear from the public and identify their concerns or expertise around prescribed burning can help guide planning and communication strategies to address concerns, improve understanding, and build trust. By promoting transparency and open communication around the process of burning, fire practitioners can

improve the narrative to build public understanding, confidence, and support in returning fire to our lands. In the remainder of this document, we outline a systematic approach to ensure that actions like these are considered in the development of a Fire Communication Plan – one that not only influences public perceptions of fire, but engages multiple stakeholders, rights holders, and partners in an informed and effective way.

A FIRE COMMUNICATION PLAN LEADS WITH TRUST

A **Communication Plan** provides a protocol for fire managers to effectively communicate and engage with the broader community about their fire practices and can be adapted to the needs of fire managers and the community. It guides how to communicate about burning, detailing when to communicate with whom, in what format, and what the message should be. It's important for messaging to use consistent terminology, and be specific and appropriate for the target audience (Kunkle et al., 2015). Communication must be two-way and occur often to allow feedback on improving communication strategies and for the development and maintenance of relationships, thereby building the foundation for trust in those practicing fire management.

The importance of a communication plan is, first and foremost, to establish trust between those who use fire and those who perceive its effects. Trust-building is essential to develop effective fire programs and increase public support (McCaffrey, 2006; Olsen et al., 2014; Toman et al., 2014; Wildfire Planning International, 2017). Building trust can lead to various beneficial outcomes, such as increased credibility for fire managers, more open communication and information sharing, and improved problem-solving through collaboration based on shared values. The preconditions necessary to build trust are interdependence, uncertainty, risk, and expectations (Olsen et al., 2014; Sharp et al., 2013) (Table 3.1). Trust-building fills gaps; specifically it addresses risk and uncertainty by meeting expectations in relationships and cooperating with all parties involved.

Table 3.1. *Preconditions of Trust, adapted from Olsen et al. (2014).*

PRECONDITIONS	EXPLANATION
Interdependence	In most fire management situations, the interests of one party cannot be fulfilled without depending on actions of another. Fire and fuels cross ownership boundaries, requiring cooperation among agencies and property owners throughout the fire management cycle — whether it's to mitigate risk, respond to a wildfire, or recover after a fire.
Uncertainty	Both the physical and social conditions influencing fire management are complex and continue to change; this uncertainty is a source of risk. We can never be fully sure that others will fulfill obligations such as building capacity for wildfire protection or adequately communicating during a fire event.
Risk	People are vulnerable to the actions of others. For example, homeowners can feel at risk from conditions or practices on adjacent property. This situation often requires a leap of faith that others will act responsibly. In this sense, the presence of risk creates the opportunity for trust.
Expectations	Individuals anticipate that others will fulfill their obligations in a relationship. Essentially, this is faith in both the ability and follow-through of others. This could be an expectation that agency personnel will meet with the community to discuss options or that neighbors will do their share to mitigate fire conditions.

How To Build Trust In An Organization

To build the essential element of trust in a fire program first requires recognition of the underlying *qualities* of trustworthiness and then translation of these qualities into *actions* in order to support positive outcomes (see examples in Table 3.2). There are three main qualities that are important for fostering trust in the field of natural resource management: ability, goodwill, and integrity (Olsen et al., 2014; Pidgeon et al., 2010; Sharp et al., 2013). Exhibiting these qualities across organizational and field managers, including building relationships and providing spaces for open interactions; voicing concerns; and balancing opinions, values, and roles, will ultimately lead to greater trust. There are many possible actions to support the trust-building process (Table 3.2).

Applying principles of ability, goodwill, and integrity in action may look different for management agencies and field practitioners. In our context, management agencies include any organization (government or non-profit) that is responsible for stewarding lands, while practitioners serve the role within agencies to implement projects on the ground and communicate with stakeholders. Even for small land conservancies such as SMLC, both agency and practitioner roles exist. The agency culture created by its policies and actions should demonstrate competency and community values shared by its employees and other stakeholders. Field practitioners have many informal interactions with community members and stakeholders; it is their job to give attention to local concerns while carrying out practices of the agency to contribute to relationship building. Agencies that empower their field personnel to carry out their responsibilities will support greater engagement with stakeholders and positive public-facing interactions that demonstrate the organization's ability, integrity, and goodwill.

Table 3.2. *Action Framework for Trust Building among Management Agencies, Field Practitioners, and Stakeholder/Community Members, adapted from Olsen et al. (2014).*

QUALITY	WHAT IS IT?	CONTRIBUTORY ACTION	DESIRED OUTCOME
Ability	Knowledge, skill, and competence demonstrated by an organization	Agency: coordinate projects and resources across stakeholder boundaries	Provide Leadership
		Practitioner: determine best tools and mediums of communication for different target audiences	Effective Communication
Goodwill	Acting in the best interest of others	Agency: have systems to provide specific, relevant, and timely information during a prescribed burn	Sincere Engagement with Stakeholders
		Practitioner: legitimize different kinds of knowledge around burning (e.g. scientific, local experience, Indigenous, etc.)	Building Community Capacity
Integrity	Acting in accord with values that all members of the community share	Agency: develop collaborative processes for meaningful stakeholder and public input and discussion	Transparent and Open Decision-Making
		Practitioner: acknowledge when value differences exist and use common values as a starting point for reaching solutions	Shared Responsibility

STRATEGIES FOR STAKEHOLDER COLLABORATION AND COMMUNITY ENGAGEMENT

In addition to guiding trust-building between fire managers and stakeholder groups, a communication plan is critically important for outlining stakeholder collaboration and community engagement strategies. These strategies will be most effective when centered around building structured relationships founded on the key values identified above: trust, transparency, accountability, respect, and knowledge-sharing. Such cooperative efforts can strengthen a burn program by increasing fire's effectiveness on the ground, meeting diverse burn objectives, and creating a unified message to the public. Each of these will contribute to supporting the long-term success of a burn program.

Who Are the Stakeholders?

The first step to approaching structured partnership-building for a prescribed burn program is to define the key stakeholders. For most agencies, this will include a variety of entities, including the local public sector; a burn contractor (if contracting out); and other land managers or organizations that use fire on the landscape. The public sector includes the local fire department, and nearby schools or hospitals, who must be notified during the event of a prescribed burn. In southern Michigan, local or county fire department officials will also provide the permits required for burning. Identifying potential organizational partners, such as other conservancies and land trusts, that long-term share visions for increasing fire implementation in our shared landscapes will provide critical support (via funding or personnel) for capacity-limited organizations attempting to build a prescribed fire program.

For any organizations reliant on public approval, including SMLC, community supporters and preserve neighbors are also vital stakeholders (hereafter referred to as community groups) since their donations and volunteer contributions help sustain the organization. For organizations that have or are building relationships with Indigenous Tribes, we see the common goals for ecological burning as a starting place for envisioning a collaborative partnership between Western fire practitioners and Indigenous fire practitioners. We distinguish Indigenous Tribes as a rights-holder group in recognition of their special rights as sovereign nations.

Once an organization identifies key stakeholders, community groups, and rightsholders it can define the purpose of the relationship jointly with each group. In this process, communicating the core values and the project goals of each partner or group is essential to find common ground among diverse group interests and positions, and identifying tradeoffs that exist for partnership projects (Shindler et al., 2011). It is likely parties will have differences and may not agree on some issues; creating a collaborative environment in which everyone's opinions are valued will help partners in reaching a consensus on the goals of the partnership. For the example entities described above, the relationship goals may include providing clear, coordinated messaging to the public (fire department); sharing knowledge about best fire practices (other fire practitioners); and getting fire on the ground (burn contractor).

Building strong engagement between community, stakeholder, and rightsholder groups also requires general and specific knowledge about each group. Knowing the history of relations between the host

organization and community or stakeholder groups will contribute to recognizing any current tensions or distrust that exist, and inform on how to improve the relations moving forward. Learning the history of new partners, such as Indigenous Tribes, is also essential to demonstrate a willingness by the host organization to invest in building a genuine relationship that acknowledges societal wrongdoings of the past (See Chapter 2: Understanding Anishinaabe Cultures...). Organizations that take the time to learn of each group's specific values, culture, education level, and communication preferences will allow for more strategic engagement and communication that fits the goal for the relationship.

Cultivating Strategies and Products For Engagement

There are a variety of ways to engage with different stakeholder, community, and rightsholder groups based on the unique nature of the purpose of each relationship. Engagement approaches can be thought of as falling along a spectrum based on the flow of information and the involvement of stakeholders in decision making, from the one-way flow of information (inform) to a system of shared leadership (empower), as illustrated in Figure 3.2. The form of engagement chosen should match the goals of that relationship. Establishing the roles of each group in the relationship will ensure that expectations are understood, and that responsibilities are justified and informed by values and capacity, leading to smoother relations.

For SMLC, we have developed sample collaboration and engagement strategies by defining who we believe are the essential community, stakeholder, and rightsholder groups and what engagement could look like for each (Table 3.3). A similar table could be constructed for any organization using this framework. While we provide relevant ideas for engagement purposes, methods, and products for different entity groups, these must all be further developed jointly as relationships with each entity are formed and evolve over time. Note that the options of engagement methods span the spectrum in Figure 3.2.

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
GOAL	To provide stakeholders with balanced and objective information to assist them in understanding the problem, alternatives and solutions.	To obtain stakeholder feedback on analysis, alternatives and/or decisions.	To work directly with stakeholders throughout the process to ensure that their concerns and aspirations are consistently understood.	To partner with stakeholders in each aspect of the decision from development to solution.	Shared leadership of community-led projects with final decision-making at the community level.

Figure 3.2. *The Spectrum of Engagement, provided by The Tamarack Institute.*

Table 3.3. (front) *Fire Communication and Engagement Guidance Chart. Key entity groups are defined as community groups in green (SMLC community supporters and preserve neighbors), other stakeholder groups in orange (burn contractor, local public sector, and fire practitioners/management agencies), or rights-holder group in tan (Indigenous Tribes). See text and Boxes for more details on certain Methods and Products.*

ENTITY	PURPOSE OF ENGAGEMENT	METHODS OF ENGAGEMENT	PRODUCTS AND RESOURCES
SMLC Community Supporters	- Develop organizational support through fostering relationships, building trust, and educating - Identify shared values and potential concerns - Generate enthusiasm for increasing restoration and stewardship work across southeast Michigan lands	- Inform through year-round communication via newsletters, social media updates, etc. - Involve in community events, such as a burn demonstration or guided tours of frequently burned sites - Empower in volunteer activities on pre-burn site preparation or post-burn monitoring and assessment	- Educational fact sheets and informational flyers - Interactive tools such as Story Maps or a community chrono-log (photo monitoring) project - Protocols for assessing burn success - Survey to assess feedback on communication effectiveness
Preserve Neighbors	- Build trust and awareness of SMLC stewardship activities - Prevent legal retaliation - Improve public acceptance of prescribed fire	- Inform neighbors using multiple media re. upcoming prescribed burns at nearby preserves - Involve with community forums to hear concerns and feedback	- Replicable notification plan for each burn - Postcards and signage notifying of planned burns - Survey to assess feedback on communication effectiveness
Burn Contractor *(e.g. PlantWise)*	- Efficiently plan for prescribed burns - Properly prepare burn units, including burn breaks - Determine appropriate weather conditions for burning	- Consult & collaborate at Practitioner Hike and Learn and Burn events (see Box 1) - Consult through email communication and attending prescribed burns	- Burn Prescription Outline - Smoke Management Plan - Species of concern chart, invasive species chart

Table 3.3. (back) *Fire Communication and Engagement Guidance Chart. Key entity groups are defined as community groups in green (SMLC community supporters and preserve neighbors), other stakeholder groups in orange (burn contractor, local public sector, and fire practitioners/management agencies), or rights-holder group in tan (Indigenous Tribes). See text and Boxes for more details on certain Methods and Products.*

ENTITY	PURPOSE OF ENGAGEMENT	METHODS OF ENGAGEMENT	PRODUCTS AND RESOURCES
Local Public Sector *(e.g. Superior Township Fire Department, Schools, Hospitals)*	- Create unified message around prescribed fire for the public - Ensure prescribed burns are carried out safely	- Involve with seasonal meetings to discuss planned burns - Collaborate on development of plans and delegate decision-making for successful implementation	- MOU or other cooperative agreements for partnerships - Burn notification, smoke management, contingency, and communication plans
Fire Practitioners/ Management Agencies *(e.g. Kalamazoo Nature Center, NAP, WCPARC, MPFC)*	- Share knowledge, experience, and resources to improve burn implementation and success - Create unified message around prescribed fire for the public	- Collaborate at Practioner Hike and Learn and Burn events - Consult through email communication - Inform & consult on practice by sharing developed Burn Plans (Ch. 4)	- MOU or other cooperative agreements for partnerships - Burn Prescription Template - Species of Concern chart (Ch. 4)
Indigenous Tribes *(e.g. Pokagon Band of the Potawatomi, Huron Band)*	- Build relationships based on trust, accountability, shared values - Improve Traditional Fire Knowledge (TFK) representation in prescribed fire planning, implementation, and communication - Share knowledge and resources for improving fire management on shared landscapes	- Involve with conversation circles, meetings, and discussions following best practice guidance - Collaborate & Empower through prior clear and respectful communication to ensure that concerns and advice are addressed	- Land and fire practice acknowledgement - Guidelines for Tribal outreach and Tribal Knowledge Literature Sheet (Ch.2) - MOU or other cooperative agreements for partnerships

The example forms of engagement provided in Table 3.3 highlight ways to offer opportunities for interactive engagement and information sharing, which is important to enable two-way exchange of information and contributes to trust- and relationship-building between the public and agencies (S. M. McCaffrey, 2006; S. McCaffrey & Olsen, 2012). Additionally, planning events in the field can help generate enthusiasm and support for the program and more easily demonstrate the benefits of prescribed burning for those unfamiliar with these outcomes (Wildfire Planning International, 2017). Increasing familiarity with prescribed fire will help the public and partners to increase their own knowledge and reduce their concerns with the practice, aiding in public approval. We elaborate on two examples of interactive engagement activities in Box 1 - Learn and Burn events and Practitioner Hikes. Events like these can greatly enhance a prescribed burn program's implementation and success. For example, a Professional Stewards Hike (an example of a Practitioner Hike event organized by Jacqueline Courteau, Shawn Severance, and Sheila Schueller with the Ann Arbor-based Stewardship Network), brought together over twenty practitioners for an outdoor conversation about restoration and fire practices while in the field at SMLC's Conservancy Farm in November 2022.

Box 1: Interactive Engagement Activities

Learn and Burn events are field day workshops designed to bring together private landowners, consultants, land managers, and anyone interested in gaining prescribed burning experience. These events allow participants to use the proper tools and equipment under the supervision of trained personnel and promote community building and knowledge sharing between community members with a range of burning experience. The format typically involves a classroom portion to cover logistics and a field portion to cover drip torch basics, firing techniques, fire weather, smoke management, and monitoring. Learn and burn events can be paired with certification classes (typically provided by the state fire council) or informal opportunities to invite the public to watch and learn about a prescribed burn.

A **Practitioners Hike** is an informal gathering of natural resource practitioners in the field at a site of interest (local preserve, park, etc.) who wish to share knowledge and experience around natural resource management strategies. Conversations can be centered around past, ongoing, or planned projects to be implemented on the site that have relevance for other field practitioners and the broader landscape. These outdoor hikes are a great way to make one-on-one connections with other professionals in the field of natural resource management and promote collaborative exchange of information, including successes and failures.

Utilizing Partnerships to Build Capacity

For limited-capacity organizations such as SMLC, pursuing partnerships can be a great way to work towards common goals while maximizing limited resources. Some benefits associated with working in partnership for a burn program may include: creating a more unified message and reaching broader audiences; collaborative problem-solving; sharing resources such as time, funding, expertise, or equipment; and staffing burn-related activities (Schultz et al., 2020). Strategic alliances may be informal, such as through verbal agreements and associations between partners, or formal, where agreements are documented and formalized through

paperwork including a subgrant agreement, a memorandum of understanding (MOU), or a letter of intent (Office for Victims of Crime - Human Trafficking Capacity Building Center, n.d.). Partnerships necessarily serve each group involved that has a stake in an outcome; this will require power sharing in planning and reaching decisions. Additionally, providing an internal assessment of each group's capacity and limitations will promote transparency and help identify the strengths each party has to contribute. With more formalized agreements, SMLC can develop a **Partnership Plan**, which serves as a roadmap for pursuing partnerships and outlines critical information such as the organization(s) background, partnership purpose and goals, tactics to achieve the partnership, and accountability mechanisms for the partnership. Building on partnership plans, SMLC can continue to pursue MOU agreements with partners to collectively increase prescribed fire use and reduce barriers. Carney et al. (2022), collected examples of 21 prescribed-fire related MOUs that ranged in purpose from "sharing of resources" to "conducting prescribed burning" in the southeastern US and identified six common themes, shown in Box 2 below. The above collected MOUs can be used as a template or to identify the essential and beneficial components that SMLC can incorporate into their own MOUs.

Box 2: **Six Emergent Themes Identified through Qualitative Analysis of Prescribed-Fire Related MOUs** (Carney et al., 2022)

1. Agreements are a mechanism for increasing prescribed fire use and wildfire prevention
2. Different regulations and requirements are needed depending on which agencies are involved
3. Agreements exist as an acknowledgement of the need for and benefits of collective action
4. Agreements have little impact on liability
5. Trust and reciprocity are increased/developed through agreements
6. Agreements delegate authority and roles under specific context

Identifying potential new partners to help build SMLC's prescribed fire initiative will require some networking and building off of current partners' networks. A first step will be to review the Fire C&E Guidance Chart (Table 3.3) to determine *who* are the essential partners within each entity group. While some partners will be necessary for ensuring that burns are carried out safely and in accordance with local ordinances (public sector and burn contractor), other partners (fire practitioners and management agencies) will serve as a starting network for building a successful burn program.

To build their capacity and become a part of a larger community of practice, SMLC can also become a member of the **Michigan Prescribed Fire Council** (MPFC), whose mission is "to protect, conserve, and expand the safe use of prescribed fire on the Michigan landscape" (*Michigan Prescribed Fire Council*, 2023a). The MPFC is a coalition of private and public sector agencies, as well as individuals who all share an interest in using fire as a management tool. The MPFC provides workshops, training, and a wealth of prescribed fire resources, including best management practices for burning, a resource portal for more information on topics like smoke management, liability, fire effects, etc., and an educational brochure, copies of which are available upon request

so that they could be used for communication purposes. Current grant opportunities with the MPFC include hosting a public Learn and Burn event with funding provided by the White Oak Initiative. If hosted by SMLC, this event would be a great opportunity to invite community supporters to come learn about prescribed burning in action and could serve to increase awareness and support for an SMLC prescribed fire initiative. In addition to partnering with MPFC, networking with other land conservation organizations in Southern Michigan would allow SMLC to identify additional funding opportunities, initiate resource sharing, and collaboratively solve problems for increasing SMLC's capacity to build their prescribed fire initiative.

During the Professional Stewards Hike that took place at Conservancy Farm in November 2022, conservation practitioners gathered and discussed the topic of using partnerships for prescribed burning. A summary of the lessons learned is presented in Box 3.

Box 3: PSH Lessons Learned on Partnerships

- Natural communities are not necessarily confined by organizational property boundaries; therefore, partnerships are needed to burn according to ecosystem (prairie/woodland/wetland) relevant boundaries to appropriately maintain these habitats
- Formal agreements between partners from different entities may incur legal challenges, since each partner has their own policies, limitations, jurisdictions, etc.
- A solution to burning across property lines may be to have partner organizations share the cost of hiring a 3rd party burn contractor, where the burn unit encompasses land from each partner's property
- MOU agreements are currently used by the University-affiliated Matthaei Botanical Gardens and Nichols Arboretum (MBGNA) to partner with adjacent private property landowners and allow prescribed fires to carry to ecologically relevant boundaries across property lines; an example MOU agreement from MBGNA is provided in Appendix F for SMLC's consideration

How and When to Communicate

Effective burn programs will tailor their products and resources to the needs of each community and stakeholder group. The objectives for messaging, charts, plans, and agreements need to be defined, so that information provided in each is clear, concise, and easily understood by the target audience. When developing various burn program products and resources, significant thought must be given to the terminology used, which should be tailored to the target audience's educational level and familiarity with the topic and allow for growth in understanding. Additionally, developing common language and consistent terminology across stakeholder groups for messaging to the public will help reduce confusion and build trust. The messages provided in communication materials can highlight any benefits of the burn program that are specific to the target audience. This is a strategy well known through science communication, which emphasizes the importance of tailoring communication to the audience group. By taking into consideration the specific

background knowledge, values, and needs of the target audience, communication can transpire more effectively and respectfully. Therefore, an effective burn program will utilize a variety of communication products and resources to engage with their different target audience groups, as shown in Table 3.3. Some of these are explained in greater detail in Box 4.

Box 4: Diverse Ways to Communicate

Educational brochures, flyers, and infographics help introduce the topic of prescribed burning to community members, explicitly informing them about where (fire-dependent ecosystems), when (burn season), how (process), and why (ecological *vs*. fuel reduction) we burn. These products typically combine text with pictures, and will be most effective by utilizing catchy phrases, questions, analogies, humor, or excitement to engage with the reader. The goal of these products is to educate and build awareness around prescribed burning, and their widespread dissemination can make the information accessible to diverse audiences. They may even be preferable by older audiences, who may engage less with other technological methods of outreach. These would be great resources to share at in-person community events and disperse to partner agencies to share on your organization's behalf. An infographic on Indigenous Fire Use and History is provided in Appendix A.

Notification postcards are commonly used to share necessary information on where (address), when (weather dependent), why (objectives), and who (professionally trained burn crew) will be carrying out a burn. The goal of these products is two-fold: to make preserve neighbors aware of planned prescribed burns near them and to provide smoke-sensitive individuals the opportunity to request more information on how to prevent smoke exposure and to be notified on the day the burn takes place. Effective postcards will be clear and concise (not bogged down with too much text) and will provide contact information for the organization planning the burn. Notifying neighbors within a certain radius of proposed prescribed burn sites is standard procedure for burn programs. An example SMLC postcard is provided in Figure 3.3.

ArcGIS StoryMaps represent an example of an interactive tool we can develop as part of the communication resources for a burn program. As the name implies, story maps narrate a story while utilizing interactive maps to engage with and educate the audience. Similar to fact sheets, fliers, and infographics, the goal of this resource is also to educate and build awareness around prescribed burning, and story maps will also be more effective by incorporating questions, analogies, humor, and excitement. However, story maps stand apart due to their ability to weave together text with multiple media and more effectively engage with the audience to tell a richer story. Interactive media tools such as story maps may include maps, pictures, and videos that incorporate interactive elements to create a practical and enhanced participatory learning experience. Our team created an educational StoryMap on Prescribed Fire in Southern Michigan that can be shared by fire managers to increase support for burning in the region.

A **Fire Practice Acknowledgement**, provided in Chapter 2, would be a great addition to any organization's burn communication plan. This product serves a similar purpose as a land acknowledgement. It specifically seeks to honor historical fire knowledge and use by Indigenous peoples in the region, acknowledge the exclusion of Indigenous Tribes and fire use on the landscape, and emphasize the responsibility of today's fire practitioners to work together with Indigenous Tribes to return fire to our lands. A fire practice acknowledgement can be used to increase public and partner awareness of the history of indigenous fire use and exclusion, and expand our collective visions for shaping our future shared landscapes with fire.

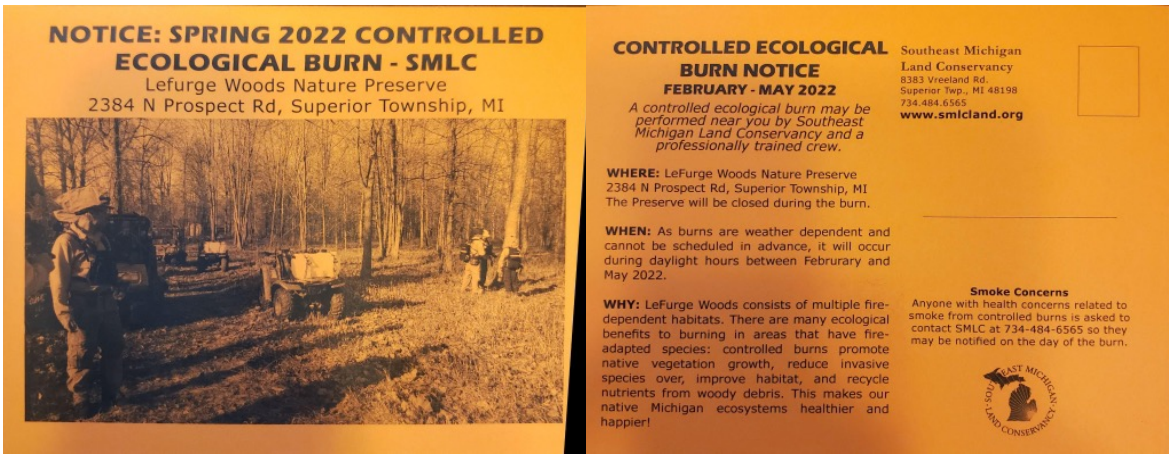

Figure 3.3 *SMLC Burn Notification Postcard, Spring 2022*

Table 3.4. *Example Burn Notification Checklist, adapted from Wildfire Planning International (2017)*

IMPLEMENTATION TIMEFRAME	COMMUNICATION ACTIVITIES
Before the Burn	- Coordinate with **burn contractor** to exchange burn prescription, prepare burn unit, and determine appropriate burn weather conditions - Consult with the **Tribal, agency,** and **community partners** to define initial burn objectives for a site - Post a press release or send out mailers to **preserve neighbors** regarding burn season dates, potential burn sites, and benefits of burning - Post-burn notices in and around proposed burn areas as well as road signage to notify **community members** who visit the nature areas or drive on nearby routes - Arrange permits with **fire department** and notify **public sector** to distribute information and coordinate consistent outreach and messaging
Day of Burn	- Notify smoke-sensitive groups (**preserve neighbors, hospital, schools**) to stay clear of the burn area, remain indoors, and close windows - Utilize **fire department** emergency radio station to reduce calls to dispatch - Stage public outreach specialists near burn unit to answer **preserve visitors'** questions - Conduct complaint tracking with **fire department**
After the Burn/ Ongoing Activities	- Utilize social media sites, newsletter, and email to provide fire and monitoring updates for **community members** and **partners** - Build interpretive kiosks for **preserve visitors** on sites that have previously been burned - Maintain prescribed fire story map posted to the website to engage **community members** and **partners** with program updates - Provide in-person guided tours to **community members**, **preserve neighbors, agency, and tribal partners** to demonstrate prescribed burn success

Prescribed burn programs need to be proactive by communicating early and often to community and stakeholder groups. Beginning communication well before a prescribed burn takes place allows community members sufficient time to discuss their questions and concerns, thereby preventing community backlash and bad press (Wildfire Planning International, 2017). Early communication with stakeholder groups will aid in coordinating outreach planning and strategizing how to meet burning objectives best. Maintaining communication efforts year-round, such as through social media, webpage, email, and newsletter updates will also generate greater awareness of the burn program and its successes, and increase overall support among the community (Wildfire Planning International, 2017). For example, to best support communication practices, fire practitioners should prepare a **Notification Plan** to establish a protocol for communication before, during, and after a prescribed burn (as illustrated in Table 3.4).

Is It Working? Evaluating and Iteratively Adapting a Burn Communication Plan

With any work that involves other collaborators such as stakeholders, community groups, or rightsholder groups, it is important to continuously gather feedback on how communication materials are received to improve the effectiveness of strategies, practices, and materials for the future. This allows for an organization's burn program communication strategies and products to be *adaptive* to the needs of all the groups with whom they work, as these needs and preferences may evolve as members within these groups change over time. Soliciting feedback also demonstrates an organization's commitment to integrity, confirming to audience groups that the organization genuinely values their input. Defining the goals of gathering feedback is a crucial first step to ensure that everyone's time and efforts are used most wisely. For example, if a goal is to get to know the target audience, using questions to learn the values and preferences of this group would be an appropriate method to meet that objective. If the goal is to evaluate a specific communication strategy used by the organization, asking questions that probe for positive and constructive feedback will be useful to understand what is working well, and which areas need improvement.

Feedback may be gathered in a variety of ways; choosing the best approach will primarily depend on the forms of engagement with each audience group. During in-person events such as a workshop or presentation with other professionals or community members, it may be appropriate to invite *discussion and conversation* to hear feedback directly and take advantage of the collaborative environment to draw from others' collective experiences and generate new ideas. Additionally, the utilization of feedback *forms* is quick and easy to administer; a Learn and Burn Evaluation Template is provided in Appendix G. To reach a larger audience such as organizational supporters in the larger community, a *survey* provides a great tool as a means to collect feedback for ongoing communication practices. To gain advice from other experts in prescribed fire, asking for direct feedback on informative or educational materials in the form of edits, comments, and suggestions on a *shared document* will be a great way to ensure information is accurately presented. When designing questions for feedback, once again consider the target

audience's presumed background knowledge and relation with the organization. Groups that have a more invested relationship with the organization may be able to offer more in-depth feedback in response to open-ended questions. In contrast, groups who are less acquainted might prefer to select from the answer choices provided.

CASE STUDY: SMLC COMMUNICATION SURVEY AS A TOOL TO ASSESS AND ENGAGE

As SMLC is just beginning to consider a burn program to date, we developed a public survey to help evaluate and inform SMLC's communication practices with community members and preserve neighbors. Our goals for the survey were threefold: 1) to understand the community base's familiarity with prescribed burning and the history of indigenous fire use, 2) to gather feedback on SMLC communication materials, and 3) to identify community preferences for receiving prescribed burn information and opportunities for engagement in the burn program. Therefore, we designed our survey questions around these goals (Table 3.5), and provided some incentive for respondents to participate in the form of a raffle gift card. We also collected general information from respondents including affiliation and length of the relationship with the organization; this informed us of who was included in the community audience and provided an opportunity to analyze how this relationship could inform other variables such as background knowledge.

Table 3.5. *SMLC Communications Survey Design*

GOAL	QUESTION	PURPOSE
Understand community's familiarity with prescribed fire	- Rank familiarity with topic of prescribed fire (5-point scale) - Rank familiarity with topic of history of Indigenous fire use (5-point scale) - Characteristics of respondents (affiliation, length of affiliation)	- Inform the development of SMLC educational materials to best suit community's educational level and allow for growth in understanding - Look at relationships between respondent characteristics and familiarity
Evaluate the effectiveness of current SMLC communication materials and practices	- Were you informed of the prescribed burns conducted on SMLC preserves past spring? If so, how? - For preserve neighbors, what information on the postcard was most valuable? - How much did reading the educational material on prescribed fire in SMLC's spring Newsletter increase your understanding of the topic?	- Inform about the reach of SMLC's communication updates - Determine if educational and notification materials are adequate or could be improved
Identify preferences for receiving communication updates and engaging with learning opportunities	- Which method of communication do you prefer to receive prescribed burn updates? - Which potential prescribed fire related educational resources or volunteer opportunities would you be interested in seeing SMLC provide?	- Provide direction for SMLC's communication strategies on notification and engagement practices

The SMLC pilot communication survey was sent out to all community members on the SMLC email list in October 2022. Our target audience was community members who had some form of affiliation with SMLC; most people on the email list would have likely interacted with the organization in some way, whether it be visiting an SMLC preserve, attending a community event hosted by SMLC, providing volunteer or monetary support, etc. To be on the email list, community members would have signed up to receive monthly news and events updates from SMLC. There were a total of 33 people who participated in the survey; as just a small subset of the total number who are signed up to receive SMLC monthly emails, their responses may not be representative of the larger SMLC community. However, this pilot survey serves as an initial trial that could be repeated in the future to gather more information about community knowledge or communication and engagement preferences. Both the survey (Qualtrics) and responses (google spreadsheet) are provided in Appendix H.

Participant Affiliation

The majority of respondents were community members, half of whom had been supporters of SMLC for more than 5 years (Figure 3.4). This type of information could be used to analyze if the length of affiliation is related to any other variables (such as level of understanding) covered in the survey.

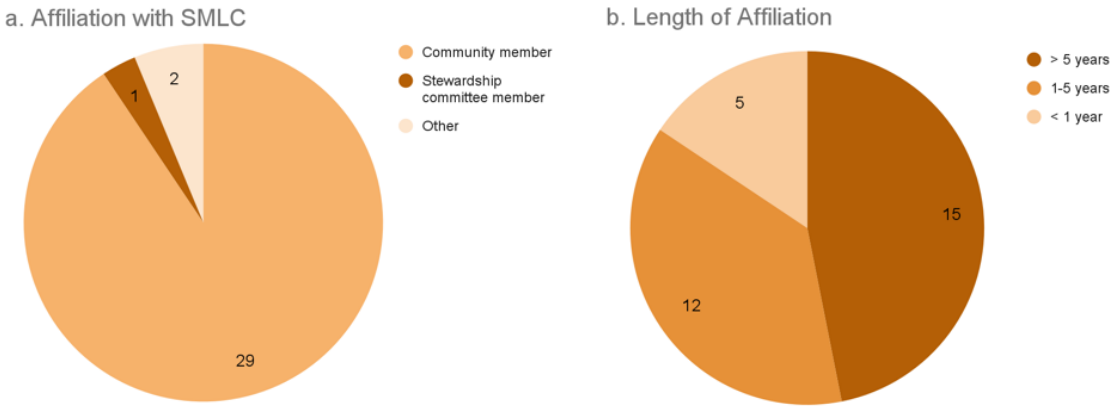

Figure 3.4. *Affiliation of survey participants to SMLC (a) and the length of the affiliation in years (b).*

Familiarity With the Topic

Almost all respondents were at least moderately familiar with prescribed burns, and more than half were very or extremely familiar with prescribed burns (Figure 3.5 a). However, only one-third of the respondents were very or extremely familiar with Indigenous fire use (Figure 3.5 b). This suggests that educational materials on the role of Indigenous fire would be useful to increase constituents' understanding and appreciation for prescribed fire. The variety of educational levels present among community members also suggests that a range of materials could be useful in increasing knowledge of prescribed fire and the history of Indigenous fire use, from introductory information to advanced material.

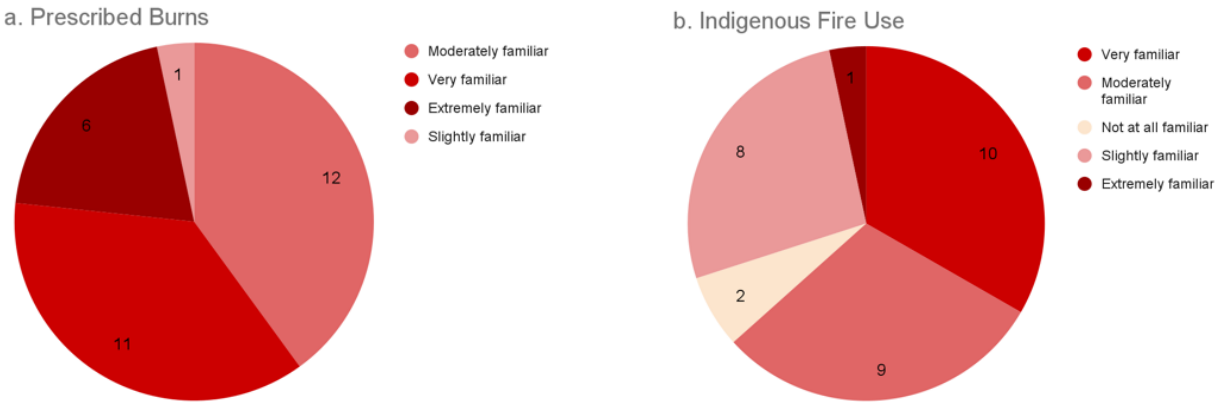

Figure 3.5. *Familiarity of survey participants with the topic of prescribed burns (a) and the history of Indigenous fire use (b), ranked on a 5-point scale.*

It might be reasonable to hypothesize that survey respondents who have a long-standing relationship with SMLC may have accumulated more knowledge related to either stewardship topic of prescribed burns or Indigenous fire use history than respondents who have a newer relationship with SMLC. To investigate whether participant length of affiliation to SMLC was related to familiarity with either prescribed burns or Indigenous fire use, we separated the data into two groups; newer constituents represent participants that have been affiliated with SMLC for less than 5 years and older constituents represent participants that have been affiliated with SMLC for greater than 5 years. Newer constituents tended to be slightly more familiar with prescribed burns than older constituents (Figure 3.6 a); conversely, they tended to be slightly less familiar with Indigenous fire use (Figure 3.6 b). These limited results do not suggest strongly that there is any association between length of affiliation with SMLC and knowledge on the topic of prescribed burns or Indigenous fire use, though more data collection could clarify this relationship, so that communication can be more targeted to the needed audiences.

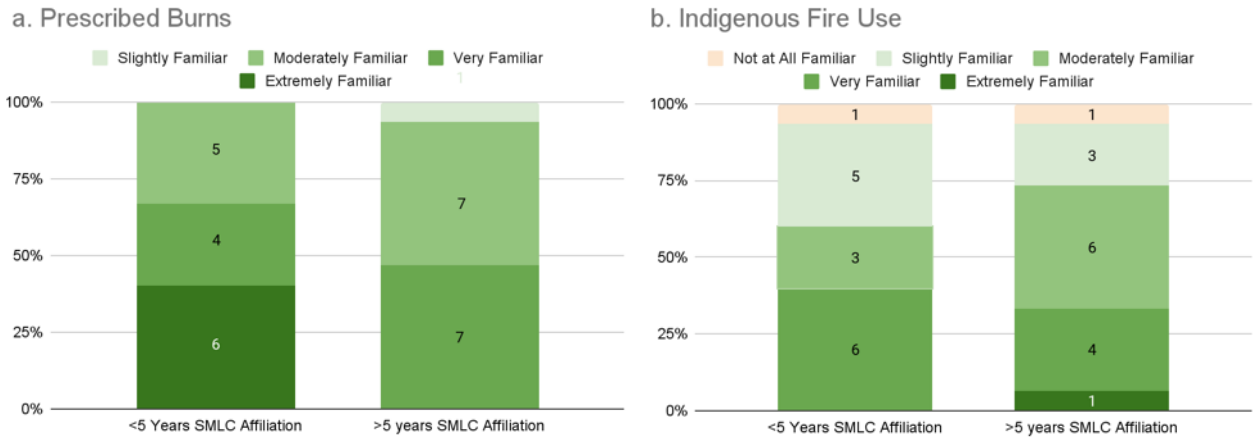

Figure 3.6. *Familiarity of survey participants with the topic of prescribed burns (a) and history of Indigenous fire use (b) separated by the length of affiliation (less than or greater than 5 years) and ranked on a 5-point scale.*

Effectiveness of Educational Materials

Over two-thirds of respondents read the spring 2022 Newsletter Article piece on the *Importance of Fire in Land Stewardship* by Michael Hahn (Figure 3.7 a). Of those who engaged with the educational material, the majority felt that the information provided at least moderately increased their understanding of prescribed fire (Figure 3.7 b). For those who reported that the article did not or only slightly increased their understanding, the familiarity of these participants with the topic of prescribed burns before reading the article ranged from moderately to very familiar. Therefore, it appears that the educational material in the Newsletter article did well to increase most participants' understanding of prescribed burns, and more so for those who had less background knowledge on the topic before reading the article. The piece therefore effectively informed a target audience with less background knowledge, and more educational materials and resources may need to be developed to provide learning opportunities for audiences with greater background knowledge.

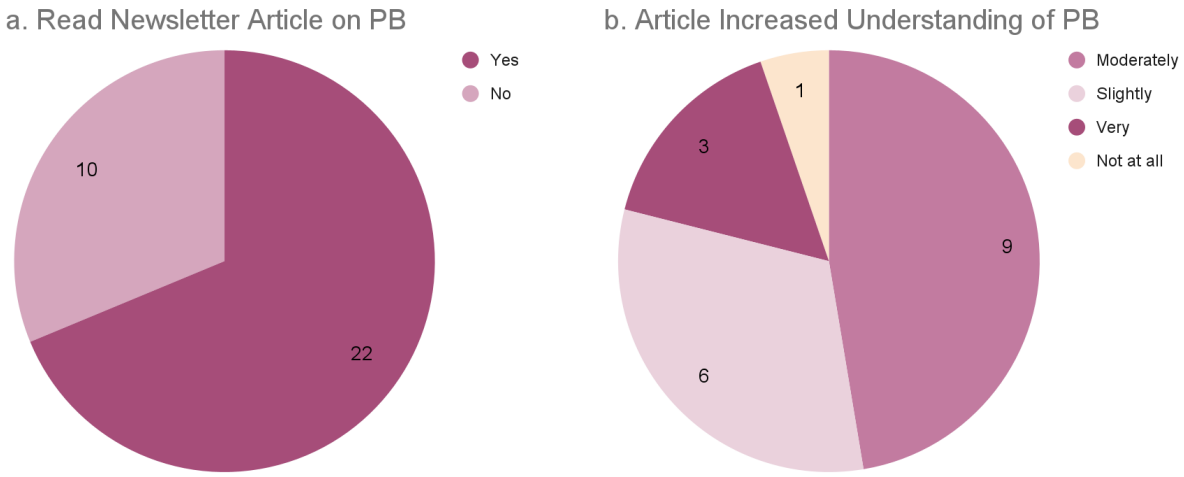

Figure 3.7. *Responses to survey questions about whether or not participants read the educational material provided in the spring Newsletter about prescribed burns (a) and if the information provided in the article increased their understanding of prescribed burns, ranked on a 5-point scale (b).*

Spring Burn Notification and Preferences

Just under half of the respondents were made aware of either the LeFurge or Lost Lake prescribed burns that occurred in Spring 2022 (Figure 3.8 a). Of those who previously knew about either burn, 50% were notified through the spring Newsletter, 19% were notified via postcard as a preserve neighbor, 19% were notified through a social media update, 12.5% were notified through phone and email communication, and 6% were notified via signage at the preserve (Figure 3.8 a). This suggests that while all notification pathways were effective in delivering planned burn information, the Newsletter updates may be the most efficient to reach the largest number of people. When questioned about notification preferences for updates on prescribed burning activities, most respondents reported that email updates are the preferred method of communication (66%), followed by social media updates (19%), and website updates (9%) (Figure 3.8 b). This information can help SMLC prioritize their limited time and resources to provide the most impactful burn updates in between their quarterly mailed newsletters.

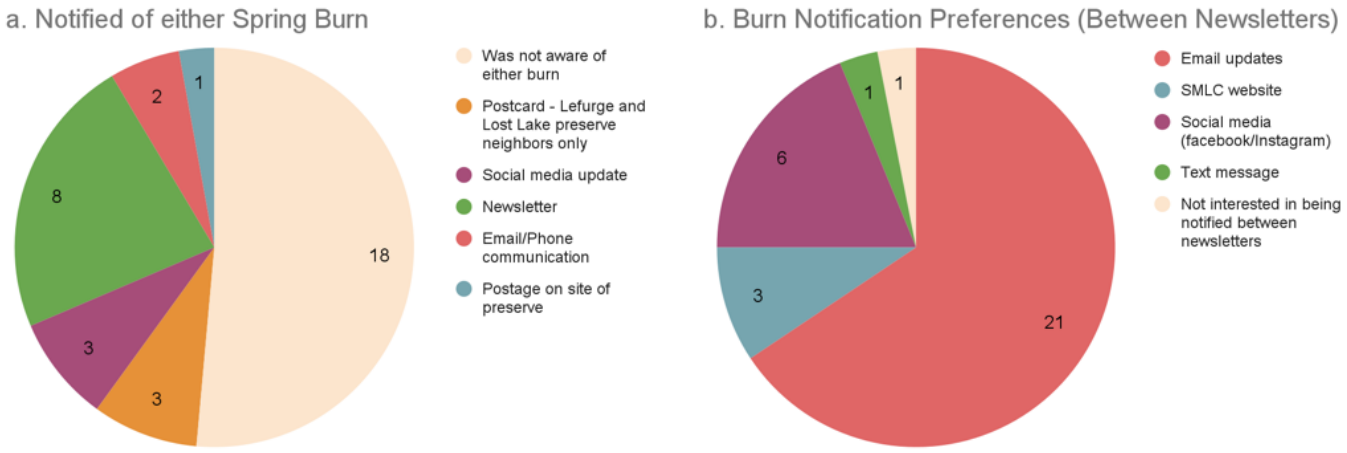

Figure 3.8. *Responses to survey questions about whether or not participants had been notified of either of the two burns that occurred on SMLC preserves in spring 2022 and how they were notified (a), and how participants preferred to be notified regarding burning updates between quarterly newsletters in the future (b).*

Opportunities for Engagement

To tailor SMLC engagement strategies with the public relating to prescribed burns, we asked survey respondents to select from a list of additional opportunities and resources they would be interested in seeing SMLC provide. Most respondents were interested in three options: post-burn volunteer work such as seeding and photo monitoring (29%); pre-burn volunteer work such as brush clearing and vegetation surveys (22%); and more information about the variety of current and historical uses of fire by different peoples on midwestern landscapes (19%) (Figure 3.9). Other opportunities and resources selected by respondents included workshops to learn how to conduct prescribed burns with SMLC (14%) and more information on the ecological benefits of fire in grassland and open woodland habitats (9%). This information will help SMLC prioritize which learning opportunities and resources they should invest in developing, and also demonstrates that at least half of survey participants are interested in volunteering with SMLC to conduct pre-and post-burn maintenance and evaluations. Survey participants were most interested in participating in vegetation surveys, photo monitoring, and seeding activities associated with ongoing prescribed burns, as well as learning more about the history of fire use in the Midwest.

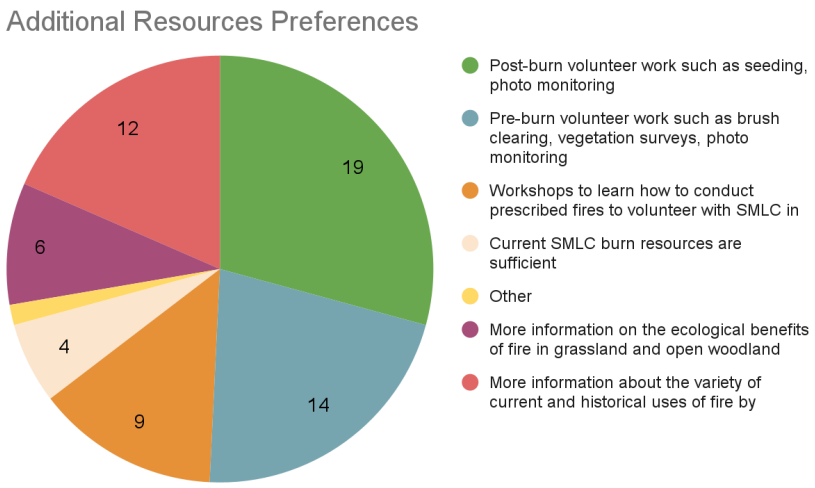

Figure 3.9. *Survey participant responses to potential SMLC offerings of additional educational resources and volunteer opportunities for engagement in the prescribed burn program. Participants could select all answer choices that interested them.*

Lessons Learned and Next Steps

This pilot SMLC communication survey marks an important first step in gathering community feedback to help inform and improve SMLC's communication plan as they grow its prescribed fire initiative. From the survey results, SMLC can direct their efforts to provide community supporters with resources that increase knowledge of historical uses of fire on Michigan's landscape and develop volunteer opportunities related to prescribed fire site preparation and monitoring. Additionally, while SMLC should continue to utilize diverse methods for informing community members and partners of planned prescribed burns, more effort can be directed towards providing prescribed fire notifications via email updates, the preferred method for the majority of survey participants.

For subsequent iterations of a communication survey, we propose the following recommendations. Questions relating to the survey audience demographic (affiliation, length of affiliation, etc.) should be included to understand who the respondents are and how that relates to their responses. Providing the ability to select more than one answer choice for certain questions relating to participants' interests or preferences will be useful for gathering the most comprehensive feedback; additionally, providing a rank option may be valuable to distinguish priority on SMLC's behalf. In the design of survey questions, ensure that each has a clear purpose that aligns with survey objectives and can inform actionable next steps. With the goal of increasing communications efficiency and effectiveness, SMLC can continue to benefit from the use of evaluation surveys in the future.

Prescribed burn at Karner Blue Sanctuary | Chris Hoving

Learn and burn event at Buhr Park | Allegra Baird

COMMUNICATION PLAN CHECKLIST & SMLC-SPECIFIC RECOMMENDED NEXT STEPS

The following **Communication Plan Checklist** (Table 3.6) is a synthesis of the information provided in this chapter into a usable format for a prescribed fire program. This communication plan should be revisited often to update communication practices, which we recommend annually.

Table 3.6. (front) *Communication Plan Checklist for a Prescribed Fire Program*

THEME	TASKS
Partner Collaboration	» **Identify your stakeholders (consider local and regional organizations, agencies, public entities, contractors, and Tribes)** • Determine how a collaborative partnership with each could work to fulfill the needs of improving the implementation of your organization's prescribed fire program » **Complete a Partnership Plan for and with each partner group; assess current partnerships** • Learn background of the partner • Establish the mutual goals of the partnership • Outline mechanisms to build and maintain the relationship • Define the preferred communication methods • Set expectations for the roles and responsibilities of each partner • Decide on the use of formal vs. informal agreements • Set up a timeline to achieve partnership » **Jointly develop necessary agreements and plans with appropriate stakeholders** • Burn plan including smoke management considerations and contingency plan with burn contractor and local government entities • MOU, Letter of Intent, or subgrant agreement with partner land management agencies or Tribal agencies » **Organize or participate in collaborative events and workshops with partners and other fire practitioners (events, hikes)** » **Request and share resources from/with other fire practitioners to improve prescribed fire implementation and success** • Educational and notification materials for the public • Best burning practices to achieve ecological objectives • Pre-burn and post-burn monitoring and evaluation protocols

Table 3.6. (back) *Communication Plan Checklist for a Prescribed Fire Program*

THEME	TASKS
Community Involvement	» **Identify community leaders that can serve as spokespersons for your organization's prescribed fire program** » **Maintain year-round communication efforts to build the public's trust in your organization** • Provide prescribed fire updates in quarterly Newsletters, monthly emails, and social media posts to community supporters • Share fliers, brochures, infographics, or a StoryMap with local public entities and community organizations to spread public awareness about the prescribed fire program » **Organize interactive events and educational opportunities to increase public and partner support for the prescribed fire program** • Public Learn and Burn • Guided tour or previously burned site • In person public forums to hear concerns • Volunteer activities for pre- and post-burn monitoring
Notification	» **Update and complete the notification plan checklist** • Ensure communication methods match audience preferences » **Tailor messaging of communication materials to target audience** • Consider target audience background knowledge, language, history, values, and needs » **Use consistent terminology across community, stakeholder, and rightsholder groups and define new ideas when appropriate**
Evaluation	» **Develop evaluation methods for each community, stakeholder, and rightsholder group that are strategic to support communication plan goals** » **Administer survey or feedback form to the public, invite direct edits and suggestions from other experts on written material, and prompt open discussion following in-person events** » **Analyze and incorporate feedback into improving communication materials, events, activities, practices, and strategies**

SMLC can use the above Communication Plan Checklist, as well as the specific ideas in the Fire Communication and Engagement Guidance Chart (Table 3.3) to help identify feasible and priority engagement entities and methods that will support SMLC's burn initiative at different phases. We specifically recommend the following key and actionable next steps for SMLC to pursue in their development of a prescribed fire communication and engagement plan:

1) Provide an interactive engagement activity or event (such as a guided hike on a previously burned site or an invitation to a future prescribed burn or an MPFC-supported Learn and Burn event) at least once a year to allow the SMLC community supporters to learn about prescribed fire's role on SMLC preserves and provide space for discussion of public concerns.

2) Disseminate educational materials (such as the infographic — Appendix A — and Story Map provided) on the role of Indigenous fire on Michigan's landscapes and prescribed fire on SMLC preserves to increase public knowledge and support.

3) Provide prescribed fire updates to community members through monthly emails in-between quarterly Newsletters, including information on upcoming planned burns at preserves, opportunities for engagement, success stories, etc.

4) Utilize the trust-building framework (Table 3.2) and tailor it to include SMLC-specific actions (such as those recommended above) that will demonstrate the qualities necessary to increase trust between SMLC and other partners and community groups.

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CHAPTER 4: DEVELOPING AN EFFECTIVE AND INFORMED PRESCRIPTION BURN PLAN

PURPOSE AND AUDIENCE

The intentional application of fire on a landscape, also known as a controlled or prescribed burn, is an important tool in land stewardship. Effective prescribed burns require a site-specific Burn Plan that relates to the management goals and logistics of that site. Prescription Burn Plans are an essential component in the preparation of every prescribed burn. Many land stewardship organizations, agencies, and contractors use Burn Plans, but these differ widely in structure and content. At the same time, despite an accumulation of fire science, traditional ecological knowledge, and experience with burns, there is a lack of synthesized guidance on how to revise and create effective Burn Plans. We meet this need by gathering a broad base of currently available evidence and expertise to provide **1)** a background of the fundamental aspects of a Burn Plan, **2)** a novel and comprehensive Burn Plan Template that practitioners can customize in the implementation of future burns on their sites, and **3)** a chart of best prescribed burning practices specifically to promote or protect native species of concern. These materials are intended to support current and future land managers who want to revise or incorporate a comprehensive plan for prescribed burning into their land management practices.

INTRODUCTION TO WRITING A PRESCRIPTION BURN PLAN

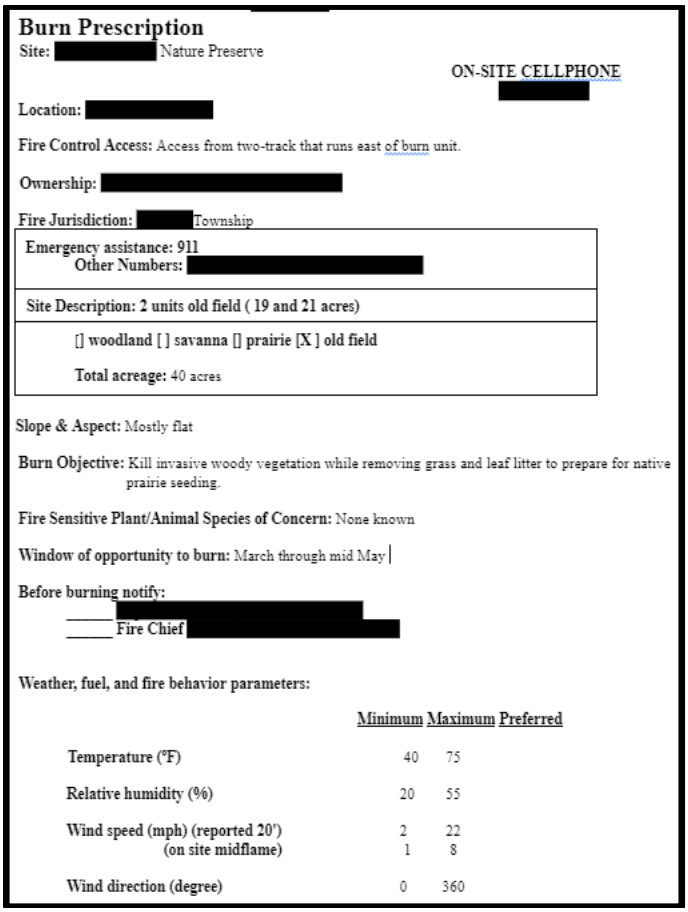
Why are Burn Plans Necessary?

A Burn Plan is a detailed written document prepared before a prescribed burn that includes a site description, burn objectives and goals, and safety information. Land managers use Burn Plans to think through all the actions and their consequences, both to meet social and ecological goals for the site, and to reduce complications during fire implementation (Oklahoma State University, 2017). Burn Plans are a way of organizing the multitude of details and logistics necessary to conduct a burn. For example, the fire practitioner is responsible for understanding any legal requirements and reviewing the prescribed Burn Plan with county officials before the burn day. Since the document contains information regarding the planning, safety, and fire operations, it is necessary to have it finalized prior to the day of the burn so that the land manager can share copies with the burn crew (Waldrop & Goodrick, 2012). If a land manager decides to hire a contractor to burn a site, the burn contractor will most likely prepare the entire Burn Plan and can provide a copy upon request. When fire practitioners properly plan a prescribed burn for a site, it becomes a significant driver in fulfilling the urgent need to increase capacity to burn in Michigan (Cohen et al, 2021) and in achieving evidence-based land management objectives and goals.

What are Major Challenges in Creating Burn Plans?

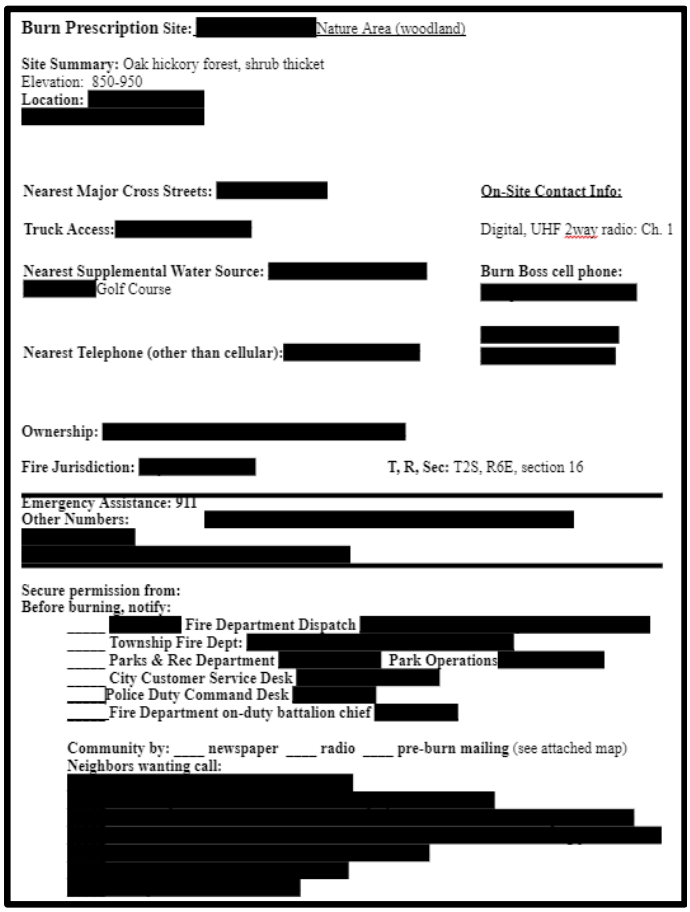
Despite the growing field of practice and research in prescribed burns, there is a lack of synthesized information to create and/or revise Burn Plans. Many states provide Burn Plan Template examples on their website (Texas Department of Agriculture, 2023; Iowa Department of Natural Resources, 2013), yet Michigan's Department of Natural Resources website lacks guidance for burn preparations beyond burn permit information. The National Wildfire Coordinating Group (NWCG) has a published Prescribed Fire Plan Template that is used by the Michigan Prescribed Fire Council (MIPFC), but their level of complexity is geared more toward agency-level burns, therefore, there is still a need to fill the gap of a template that is more accessible and relevant for smaller-scale burns conducted by NGOs; private contractors; and city, township, or county-level entities. With limited knowledge and capacity, a new fire practitioner beginning a burn program will often copy a Burn Plan from a familiar environmental organization or former colleague. The accumulation of copied Burn Plans with slight adjustments creates an overflow of plans that differ in content and structure (Figure 4.1), leading to confusion about the critical components needed to put fire on the ground. The overabundance of Burn Plans distracts from the importance of implementing best science and practice, especially for organizations with limited resources. Resource-related barriers, including limited funding, limited capacity, and lack of burn experience, create a gap between prescribed fire planning and implementation (Miller et al., 2020). However, current fire research and in-field prescribed burn experiences can inform and improve existing Burn Plans.

An accessible and well-informed Burn Plan template would allow practitioners to customize Burn Plans to their site in a safe and logical structure, while also incorporating space for adapting to current best



Burn Prescription
Site: [redacted] Nature Preserve
ON-SITE CELLPHONE [redacted]
Location: [redacted]
Fire Control Access: Access from two-track that runs east of burn unit.
Ownership: [redacted]
Fire Jurisdiction: [redacted] Township
Emergency assistance: 911
Other Numbers: [redacted]
Site Description: 2 units old field (19 and 21 acres)
[] woodland [ ] savanna [] prairie [X] old field
Total acreage: 40 acres
Slope & Aspect: Mostly flat
Burn Objective: Kill invasive woody vegetation while removing grass and leaf litter to prepare for native prairie seeding.
Fire Sensitive Plant/Animal Species of Concern: None known
Window of opportunity to burn: March through mid May
Before burning notify:
_____ [redacted]
_____ Fire Chief [redacted]
Weather, fuel, and fire behavior parameters:

	Minimum	Maximum	Preferred
Temperature (°F)	40	75	
Relative humidity (%)	20	55	
Wind speed (mph) (reported 20')	2	22	
(on site midflame)	1	8	
Wind direction (degree)	0	360	



Burn Prescription Site: [redacted] Nature Area (woodland)
Site Summary: Oak hickory forest, shrub thicket
Elevation: 850-950
Location: [redacted]
Nearest Major Cross Streets: [redacted]
On-Site Contact Info:
Truck Access: [redacted]
Digital, UHF 2way radio: Ch. 1
Nearest Supplemental Water Source: [redacted]
Burn Boss cell phone: [redacted]
[redacted] Golf Course
Nearest Telephone (other than cellular): [redacted]
Ownership: [redacted]
Fire Jurisdiction: [redacted]
T, R, Sec: T2S, R6E, section 16
Emergency Assistance: 911
Other Numbers: [redacted]
Secure permission from:
Before burning, notify:
_____ [redacted] Fire Department Dispatch [redacted]
_____ Township Fire Dept: [redacted]
_____ Parks & Rec Department [redacted] Park Operations [redacted]
_____ City Customer Service Desk [redacted]
_____ Police Duty Command Desk [redacted]
_____ Fire Department on-duty battalion chief [redacted]
Community by: ____ newspaper ____ radio ____ pre-burn mailing (see attached map)
Neighbors wanting call:
[redacted]

Figure 4.1. *Examples of the first page of Burn Plans that differ in content and structure (personal information redacted). While both plans have similar elements including the address of the burn site, emergency numbers, and on-site contact information, they differ in the amount of detail in the notification checklist, site description, possible burn dates, burn objective, and more, making it unclear as to essential elements of a plan.*

practices in burn planning. Southeast Michigan Land Conservancy (SMLC) is seeking to move from ad hoc prescribed burns to a more coordinated long-term fire program that would require informed Burn Plans for their top priority sites (See Chapter 1: Introduction to Prescribed Burning and the Southeast Michigan Land Conservancy). As a small nonprofit with limited capacity, they need information on best burn practices and right preparations to generate burn plans for their sites. We sought to fill this need by providing a compiled Burn Plan template to customize for future prescribed burns on all protected SMLC sites along with a guiding chart of best practices to protect native species of concern. Our broad research-based approach to meet the needs of SMLC resulted in the creation of resources that are applicable to any entity conducting smaller-scale prescribed burns in southern Michigan.

Learn and burn event at Buhr Park, Ann Arbor MI | Foster Woodruff

Methods to Gather and Synthesize Existing Burn Plan Guidance

To develop effective guidance on Burn Planning, we incorporated key insights from prescribed fire training, fire science workshops, and burn practitioner site visits. To begin, we attended the city of Ann Arbor's Natural Areas Preservation's (NAP) Volunteer Burn Training Program in February of 2022, where we became certified to help conduct multiple burns and investigate how burn bosses implemented plans in the field. To gain more background knowledge on the construction of Burn Plans, we attended the Michigan Prescribed Fire Council's 8th Annual Burning Issues Workshop in February of 2022 and 9th Annual Burning Issues Workshop in February of 2023, where we gained access to resources and skills to develop specific prescription plans. Next, we reviewed literature on the most widely-used Burn Plan templates (National Wildfire Coordinating Group, 2021; Waldrop & Goodrick, 2012; Iowa State University, 2010; Oklahoma State University, 2017) to draw out the common, critical aspects among a prescribed Burn Plan.

To provide a burn template especially geared towards smaller-scale burns conducted by NGOs; private contractors; and city, township, or county-level entities in the Southern Michigan area, we collected and reviewed successful Burn Plans from experts in stewardship organizations across Michigan (NAP, KNC, Plantwise LLC, Southeast Michigan Land Conservancy (SMLC)). We distilled the critical components of both the Burn Plans among local templates and those from the literature review. We met with Southern Michigan stewardship experts through several gatherings during SMLC site visits and a Stewardship Network Professional Stewards Hike. These meetings helped us identify gaps in knowledge or plan elements that needed to be addressed. One area that became apparent was the need to guide practices when burning in areas that could or did contain species of concern. To specifically address this issue we gathered information from species-specific sources and experts across the region, including the Michigan Natural Features Inventory (MNFI), Matthaei Botanical Garden and Arboretum (MBGNA), City of Ann Arbor Natural Areas Preservation (NAP), and Kalamazoo Nature Center (KNC). After completing the prescribed burn template, we presented a draft to The Stewardship Network Conference in February 2023, where we received further feedback and ideas from the fire practitioner community.

Through this iterative process of research and sharing we produced guidance on the structure and content of a Burn Plan, as well as how to support species of concern within the plan. This guidance is practitioner-reviewed and backed up by substantial scientific literature and in-the-field perspectives, allowing entities with limited resources to immediately take a comprehensive and systematic approach to planning their prescribed fire management practices. In the following sections, we further explain the key findings from our research as well as the specific tools we developed.

Prescribed burn at the Outdoor Discovery Center in Holland, MI | Summit Metro Parks

What are the Essential Elements of a Burn Plan?

Although burn plans may differ based on the environmental organization and unique site elements, our research highlights four essential elements of any Burn Plan:

1) Purpose & Objectives - Every effective prescribed burn has a clear ecological purpose and reasoning for putting fire on the ground that is connected to the overarching goal listed in a site's Management Plan. An example of an effective burn objective is to support fire-dependent prairie habitat by reducing non-native shrubs and increasing representative native plants. A strong burn objective is measurable and serves as a framework to help evaluate the success of a prescribed burn as it relates to the accomplishment of the site's Management Plan goal. The prescribed burn purpose and objectives also help inform other components of the Burn Plan, including the season to burn, fire intensity, and optimal weather conditions.

2) Burn Unit Description - The area of land proposed to be burned is broken down into units depicted on a map. The map distinctly highlights the size of the unit, topographic information, and the boundary of the burn unit that contains the fire in that designated space, also known as a burn break (Figure 4.2). Additional information in the burn unit map can include the location of water, signage, and wind direction.

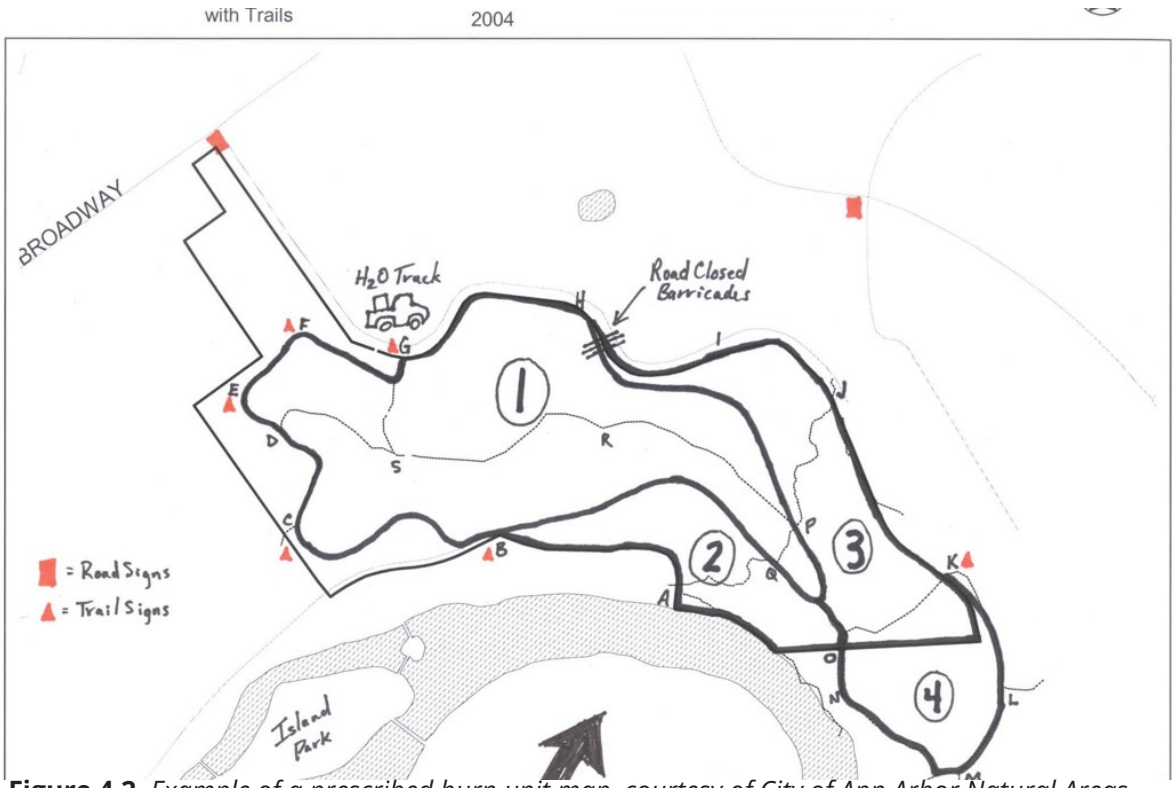


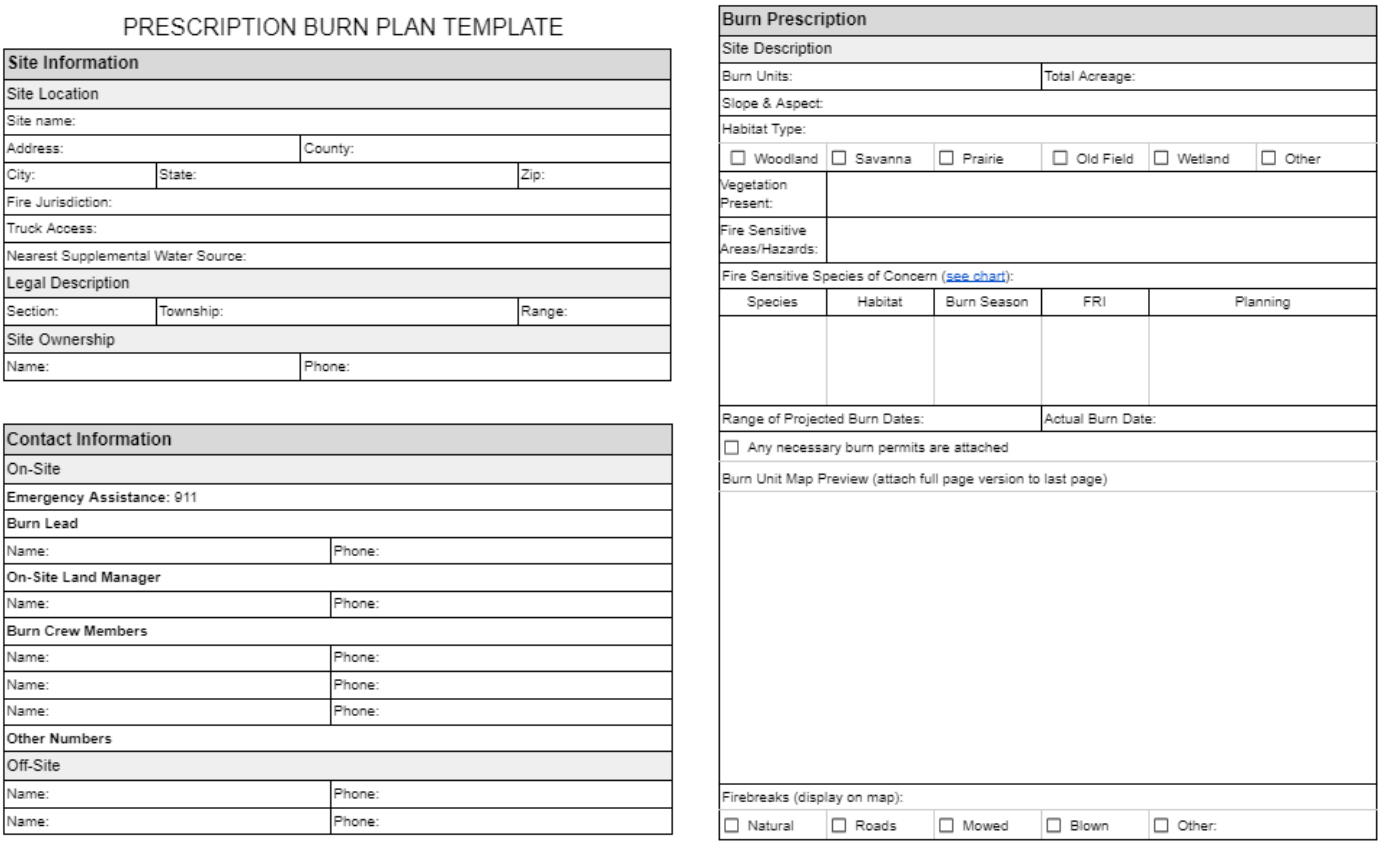
Figure 4.2. *Example of a prescribed burn unit map, courtesy of City of Ann Arbor Natural Areas Preservation (NAP). The burn area is broken into four units, each labeled with a corresponding number. The dark line distinguishing the burn units represents a burn break. The letters provide direction for the burn boss to direct the burn crew in carrying the fire. The map clearly shows the wind direction, location of the water truck, signage, and any obstacles that the burn crew needs to be aware of for safety purposes.*

3) Prescribed Burn Operations - Burn operations incorporate the logistics of putting fire on the ground. It may be further divided into pre-burn operations, the ignition plan, and post-burn activities.

> ***Pre-Burn Operations*** - Before burning, specific site and planning preparations need to occur. The social communications aspect includes the notification contact list of neighbors surrounding the site (as discussed in Chapter 3: Communication Planning for Fire Managers), necessary permits or approvals, and any agreements needed by adjacent organizations or land owners. The ecological site preparations include the construction of burn breaks, the required weather conditions for a safe burn, and the smoke management plan.
>
> ***Ignition Plan*** - The plan for igniting the prescribed burn incorporates the sequence and direction of ignition of personnel with drip torches. Figure 4.2 illustrates one method of using letters of the alphabet to provide direction of the ignition sequence.
>
> ***Post-Burn Activities*** - When concluding prescribed burn operations, "mop-up" ensures that all fire is extinguished. The burn boss assigns roles of post-burn responsibilities for each burn unit to ensure that no more fire or smoke is present on site before leaving.

4) Safety & Contingency Plan - A safety plan incorporates emergency contact information and procedures for a safe prescribed burn. Emergency contacts include the fire jurisdiction and emergency medical services. A contingency plan clearly outlines potential hazards, each crew member's responsibility if fire escapes the boundaries, and escape routes. It is essential to include physical copies of the safety and contingency plans in an accessible location in the event of sudden fire behavior changes.

While the critical components of site-specific details and safety planning are needed in the Burn Plan, it is important not to clutter a plan with overly specific details that may prevent the execution of the prescribed burn. If the plan is too unnecessarily prescriptive, then the fire practitioner may not be able to put fire on the ground. Many practitioners agree that plans must allow for flexibility and adaptability. Importantly, Burn Plans should incorporate the uncertainty of the local climate through weather condition ranges that are realistic and flexible in the seasonal timing of a burn, so that the land has a greater chance to be burned. Throughout all components of the Burn Plan, public safety is balanced with the ecological need to put fire on the ground.



PRESCRIPTION BURN PLAN TEMPLATE

Site Information		
Site Location		
Site name:		
Address:	County:	
City:	State:	Zip:
Fire Jurisdiction:		
Truck Access:		
Nearest Supplemental Water Source:		
Legal Description		
Section:	Township:	Range:
Site Ownership		
Name:	Phone:	

Contact Information	
On-Site	
Emergency Assistance: 911	
Burn Lead	
Name:	Phone:
On-Site Land Manager	
Name:	Phone:
Burn Crew Members	
Name:	Phone:
Name:	Phone:
Name:	Phone:
Other Numbers	
Off-Site	
Name:	Phone:
Name:	Phone:

Burn Prescription					
Site Description					
Burn Units:			Total Acreage:		
Slope & Aspect:					
Habitat Type:					
☐ Woodland	☐ Savanna	☐ Prairie	☐ Old Field	☐ Wetland	☐ Other
Vegetation Present:					
Fire Sensitive Areas/Hazards:					
Fire Sensitive Species of Concern (see chart):					
Species	Habitat	Burn Season	FRI	Planning	
Range of Projected Burn Dates:			Actual Burn Date:		
☐ Any necessary burn permits are attached					
Burn Unit Map Preview (attach full page version to last page)					
Firebreaks (display on map):					
☐ Natural	☐ Roads	☐ Mowed	☐ Blown	☐ Other:	

Figure 4.3. *First two pages of our Prescription Burn Plan Template that contain the essential components of a Burn Plan in a chronological and organized manner.*

Customizable Burn Plan Template

Our synthesized Prescription Burn Plan Template (Appendix I) is a compilation of essential aspects of successful prescribed burn programs in combination with novel components to address the needs of fire practitioners. In the innovative design, we format the plan in chronological order of the burn (pre-, during, and post-burn) and provide practical checkboxes and "fill-in-the-blanks" that allow for customization to a specific site or organization (Figure 4.3). This Prescription Burn Plan Template helps fire practitioners and land managers to prepare for the introduction of controlled fire on the landscape as one of the many tools needed to accomplish a site's overall management goals. It may be used as part of an environmental organization's Operational Protocols in the preparation stages of planning a prescribed burn for a site. Multiple Burn Plans may be needed for each site depending on the site's acreage, seasonality, and fire frequency.

It is important to note that the intent of our Burn Plan Template is for accessible and applicable guidance in smaller-scale burning. The decision to adopt and utilize these plans are made independently by the fire practitioner and land managers, who need to also understand their state, county, or township legal requirements and liability when it comes to prescribed fire. As there are no federal requirements for the components of a Burn Plan, our template includes only the critical components

of a Burn Plan based on our research. Anyone conducting a prescribed burn will still need to utilize best management practices, engage in effective communication with neighbors and fire departments (See Chapter 3: Communication Planning for Fire Managers), and be mindful of any changes in the weather as the burn occurs.

Our methods of working and learning together with fire practitioners, land managers, and scientists culminated in a valuable and novel Burn Plan template that also has the potential to allow for more effective communication and collaboration across entities previously using different Burn Plans. That is, widespread use of a comprehensive shared Burn Plan template allows practitioners to customize their plan to their site, while still having an open, communicative, and collaborative workspace with more clearly shared key elements and structure. Cooperative approaches have the potential to enhance the effectiveness of environmental management actions that transcend property boundaries (Baumber et al., 2018), which is necessary for fire-dependent habitat that occurs across property lines. Through multi-organizational learning, collaboration, and creation, the prescribed Burn Plan template embodies adaptive co-management (Armitage et al., 2007).

Burn Boss Amanda Rau directs fire practitioners during a controlled burn | Jason Houston

KEY CONSIDERATIONS FOR COMPLETING A PRESCRIPTION BURN PLAN

How Can I Incorporate the Best Available Fire Science in My Burn Plan?

The utilization of best available science information (BASI) in the planning of prescribed burns is critical to understanding the effectiveness and safety of fire use, yet prescribed fire research is often underutilized. Much of the planning and implementation of prescribed fire comes from a burn manager's memory which takes years of experience to achieve (Siegel, 2022), and lack of manager awareness is commonly identified as a barrier to the application of science (Hunter, 2016). When fire practitioners are aware of BASI, there is often little direction on what constitutes BASI and how managers can trust these sources (Esch et al., 2018). With a changing climate, introduction of new species, and a generation of new fire practitioners, there is a high need for accessible and applicable science-based prescribed fire practices (Fitzgerald, 2020). Through our literature review, meetings with experts, and public engagement, we identified four key topics of current high debate among the fire community:

1) Considering **Species of Concern** when conducting a prescribed burn.
2) The response of **invasive species** to fire.
3) Choosing the appropriate **time** to burn.
4) Incorporating a prescribed burn into a site's **management plan**.

In the following section, we discuss the current BASI for each topic to help guide fire practitioner science-driven planning and management decisions.

Why is Prescribed Fire Important for Species of Concern?

While fire can pose a threat to rare fauna that live in the area, carefully planned burns can play an important role in protecting and supporting species of concern. Species of concern include native wildlife that have experienced a significant population decline and require concentrated conservation efforts to prevent the species from becoming endangered, threatened, or extirpated (Michigan Natural Features Inventory, 2022). When properly planned and implemented, prescribed burns are a powerful and cost-effective management tool to enhance habitat for species of concern by restoring fire-dependent communities, reducing invasive species, or creating early successional habitat and resources (Levihn-Coon, 2022; NCWRC, 2015). For example, the use of prescribed burns in habitat restoration helped to remove the North American songbird, black-capped vireo (*Vireo atricapilla*), from the federal endangered species list (FWS, 2018). *Lack of fire on the landscape is one of the greatest threats to wildlife that live in fire-dependent habitats*, evident in the plummeting population levels of species of concern that depend on fire at some point in their lifecycle (Lashley, 2023).

Even when the goal of prescribed burns is to create habitat for species of concern, practitioners may need to take into account how fire can pose a threat to rare fauna present at the time of burning, especially in small, fragmented landscapes (Watson et al., 2012). If species' seasonal behavior and population distribution are not considered, prescribed burns can cause high mortality of desired species. For example, significant mortality of Massasauga rattlesnake (*Sistrurus catenatus*) resulted from a prescribed burn conducted during the snake's active season and without refugia (small patches of unburned vegetation) (Cross, 2015). In small populations, the mortality of even just a few adults or juveniles can lead to dire declines in population size and genetic variability and have profound and lasting impacts on existing populations (Cross, 2015). However, just because a species of concern is located on a burn unit, it should not discourage the implementation of a burn, but rather encourage research into the conservation plan of a species and how to work around critical time periods and critical habitat of the species (Loeb, 2023). Fire practitioners might need to weigh the potential mortality risk of *individuals* with the benefits of fire to promote suitable habitat for the *species.* The potential risks can be reduced by taking basic measures to reduce mortality, as described below.

A Marbled Salamander, species-of-concern in some Southern Michigan ecosystems | Modern Texas Naturalist

How do I Consider Species of Concern when Conducting a Prescribed Burn?

In our research, we found the following key general practices to support species of concern when conducting prescribed burns:

1) Conduct prescribed burns when the species of concern are absent from the burn unit or in dormancy.

2) Divide burn units into smaller plots and incorporate heterogeneity in diversifying burn units and burn rotations to ensure suitable habitat is always present.

3) Plan for unburned habitat refugia in burn units, especially near nesting or breeding locations.

4) During the post-burn walk-through, note any animal injuries or mortality, and modify future Burn Plans accordingly.

Beyond these general guidelines, we also heard from practitioners that more species-specific guidance would be useful. So, based on our research of species of concern likely to be found in Southeast Michigan (Appendix J), we created a user-friendly summary of key best practices by species. The *Southeast Michigan Species of Concern and Prescribed Fire Recommendations Chart* (Appendix K) describes the habitat, preferred burn season, fire return interval (FRI or how often to burn), and additional planning considerations for each species of concern. This content can be used to copy species-specific amendments directly into a Burn Plan. Because the practitioner needs to have an intimate familiarity with the landscape and species present before the burn, it is recommended to start planning with species of concern in mind several years before implementation (Charland, 2023). It is important to note that some of these species may share habitats, and a Burn Plan for one species might not be the best for (or may even harm another) in the same area. Anytime a land manager is dealing with species of concern, each species has its own specific requirements that may differ, emphasizing the importance of applying fire diversely to support a diversity of species (Loeb, 2023). Therefore, the burn practitioner needs to weigh goals for a site and incorporate historical site knowledge of species presence to make informed decisions on what is best for the assortment of species within a burn site. Ultimately, a burn may not be able to account for individuals of a species while managing for their habitat, and the message we heard from many practitioners is that some burning is still better than none. That is, allowing entire areas to go unburned may be more detrimental to the health of flora and fauna, as *the key to biodiversity is pyrodiversity* (Jones & Tingley, 2022).

What is Known about Invasive Species' Response to Fire?

A frequently cited burn goal is to use prescribed burning to control invasive plant species populations, yet there is considerable debate over the efficacy of its application in the scientific literature. Managing invasive species is a high-priority task as they have the potential to outcompete native plants, alter ecosystem functions, reduce biodiversity, and undermine the recreation value of natural areas. Invasive control can be a time-consuming and costly endeavor, and prescribed burns offer an efficient

and cost-effective way to decrease the presence of invasive species (Nolen, 2019). However, there appear to be conflicting direct and indirect effects of fire on certain invasive species, while the long-lasting impacts of burns on other invasive species remain unstudied. The prevalence of anecdotal information and lack of accessible supporting data is a major limitation in determining which disturbed ecosystems can be managed with prescribed fire (Mandle et al., 2011b).

Although most invasive species did not evolve from fire-dependent habitats, they have a strong chance of rebounding after prescribed burns due to their resilience in the highly disturbed areas of post-fire environments. For example, prescribed burning increases seedling recruitment (germination rate) of the invasives honeysuckle (*Lonicera maackii*) and tree-of-heaven (*Ailanthus altissima*) (Guthrie et al., 2016). Additionally, fire can indirectly benefit other invasive species such as multiflora rose (*Rosa multiflora*) and Japanese stiltgrass (*Microstegium vimineum*) through the disturbed conditions and canopy-opening practices that facilitate their germination and seedling growth (Glasgow & Matlack, 2007). However, when investigating BASI for prescribed burning, it is important to inspect the experimental methods. For example, the studies cited above isolated the variable of prescribed burning without considering other common actions that often follow burning, such as chemical or mechanical management. There is also no mention of a potential seed bank in the soils of native plants that could outcompete the invasive species after a prescribed burn. Additionally, Guthrie et al. (2016) completed their replications all on one burn day with the same fuel loads, relative humidity, wind speeds, and burn intensity. Carefully controlled and isolated scientific experiments that make conclusions about prescribed burning need to incorporate the pyrodiversity of prescribed burns in combination with long-term observations to better test the impacts of fire on the landscape.

The positive response of invasive species germination to a one-time homogenous application of fire emphasizes the importance of prescribed burning as a long-term, interconnected, and active management tool applied in combination with other management strategies. Herbicide applications in addition to prescribed burn treatment were highly effective in killing large saplings and trees of tree-of-heaven (*Ailanthus altissima*) with no resprouting after four growing seasons (Rebbeck et al., 2019). Although sapling and seedling abundance increased in the season immediately after the burn, they did not persist and native plant regeneration was a stronger competitor. For honeysuckle (*Lonicera maackii*), prescribed burns completely kill younger specimens and top-kills (complete aboveground death) adults , producing effective results with repeated annual burning (Czarapata, 2005). When judging the effectiveness of a prescribed burn on controlling invasive species, there are also other factors to consider such as the plant type (resprouter or non-resprouter), fire return interval (FRI), and season of burn (University of Georgia, 2019), but to date, there is no existing published literature that considers the combination of these factors. Future research should perhaps focus less on the impacts of fire on specific invasive species, and more on a holistic understanding of how fire impacts the positive response rate and competitive advantage of native plants (Pyke et al., 2010b).

Understanding and managing the impacts of prescribed burns on invasive species needs to be a top priority in biodiversity management. While conflicting scientific studies with different experimental methods may indicate no concise global pattern of the complex relationship between fire and invasive plant proliferation (Mandle et al., 2011b), fire practitioners can focus on attending fire science workshops to learn about the most recent BASI while utilizing adaptive management practices to monitor the results of prescribed fire on their local sites and adapt their practices accordingly.

What Season Should I Burn: The Need for Pyrodiversity

Managers select the season to conduct prescribed burns based on the specific land management objective, corresponding with safe weather parameters. Because plant response to fire can be species-specific and season-specific (Simmons et al., 2007), the choice of timing of the prescribed burn will affect vegetation composition and its associated structure, allowing a manager to select a burn season that best removes or favors certain plant species. Figure 4.4 displays our current knowledge to-date on how common plants in the Midwest respond to prescribed fire during varying seasonal applications. There is an overall trend of nonnative species with negative responses to fire during the Summer growing season and a trend of native species with positive responses to fire during the fall season, though there is some uncertainty around that.

Current prescribed burn practices are limited in seasonal applications with most burns being conducted in Spring and Fall, highlighting the need to

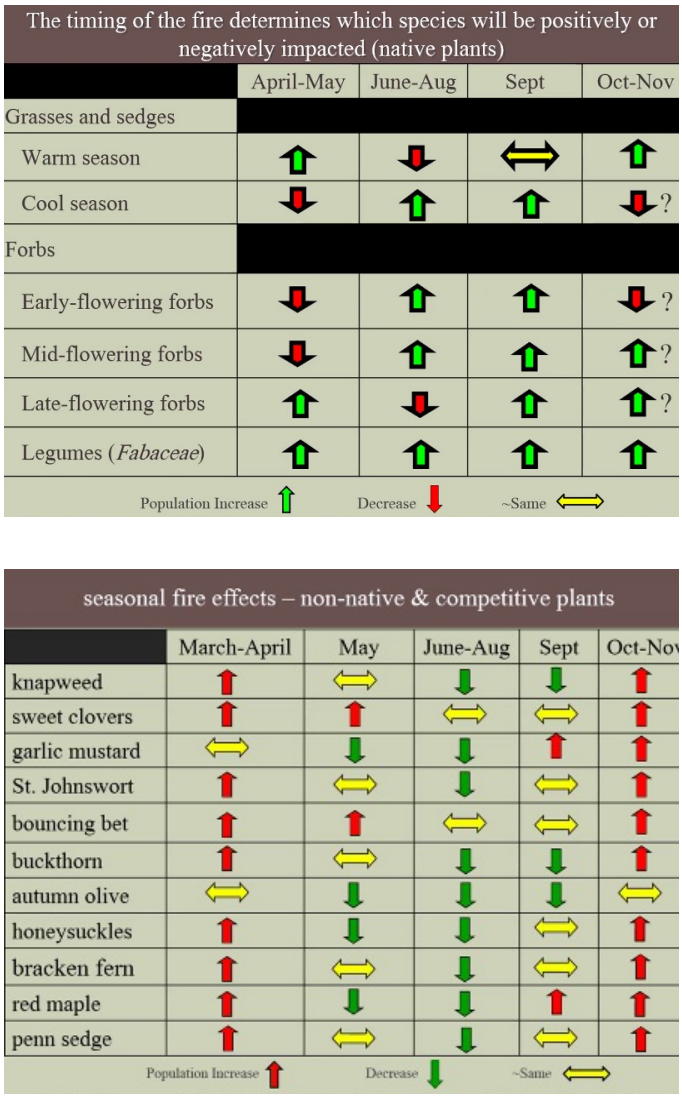


Figure 4.4. *Chart describing the relationship between the seasonal timing of the prescribed burn and the impacts on native plants (TOP) and nonnative plants (BOTTOM). The black boxes and question marks indicate current unknown or unverified information. Figure from (O'Connor, 2022).*

expand possible burn days throughout the seasons to better support pyrodiversity and biodiversity. In Michigan, 2.2 - 13.4 times more hectares of land need to burn to satisfy the fire return interval for lands with high fire dependency (Cohen et al., 2021b). The lack of understanding of the seasonal opportunities for burning often limits the implementation of a prescribed burn (Weir, 2017). In our discussions, some fire practitioners justified their specific seasonal

practices based on the historic fire regimes, but in our research, we found that recreating historic fire seasons can be problematic due to safety concerns and limited days when weather parameters are met (Weir, 2017). Additionally, mimicking historic fire regimes may not even be an option, as there might be parts of the landscape where applying fire may not be possible due to the extreme changes in the landscape when it was fire-dependent, and it may not be legal due to encroachment from development (Lashley, 2023).

While more prescribed burns need to occur to meet the needs of fire-dependent habitat, it is important to address this need with broad burn prescriptions and burn applications. Every fire has individuals that die and individuals that survive, so if fire is applied the same way each time, the survivors will continue to thrive and the populations of species that die will continue to plummet (Charland, 2023). Employing pyrodiversity through burning during multiple different seasons supports native plant diversity, a mosaic of habitat types, and ecosystem resilience (Figure 4.5). In discussions of pyrodiversity, it is often thought of as as burning during multiple seasons, but there are many other methods to achieve pyrodiversity including ignition pattern, Fire Return Interval, the size of the burn unit, and how the unit will carry the fire throughout the landscape (Lashley, 2023). The benefits of conducting prescribed burns year-round indicate the importance of an adaptive and flexible burn plan, described in the Essential Elements of a Prescribed Burn Plan above.

A current highly debated conversation in fire science is the implementation of summer burns, also referred to as growing season burns. Most prescribed burns are currently conducted in the Spring and Fall (US Forest Service, 2019) when weather conditions can be unpredictable and unreliable. Summer burning is beginning to emerge as an option for fire practitioners to increase the average number of days that weather conditions meet prescription parameters to burn (Weir, 2017), therefore increasing the burn frequency and acreage. Opponents of summer burning state that it demands more intensive resources and operations to keep the fire going, only results in a lot of smoke and an inefficient burn, and lacks evidence of a long-term positive ecological response (Smith, 2014). Proponents of growing season burns point

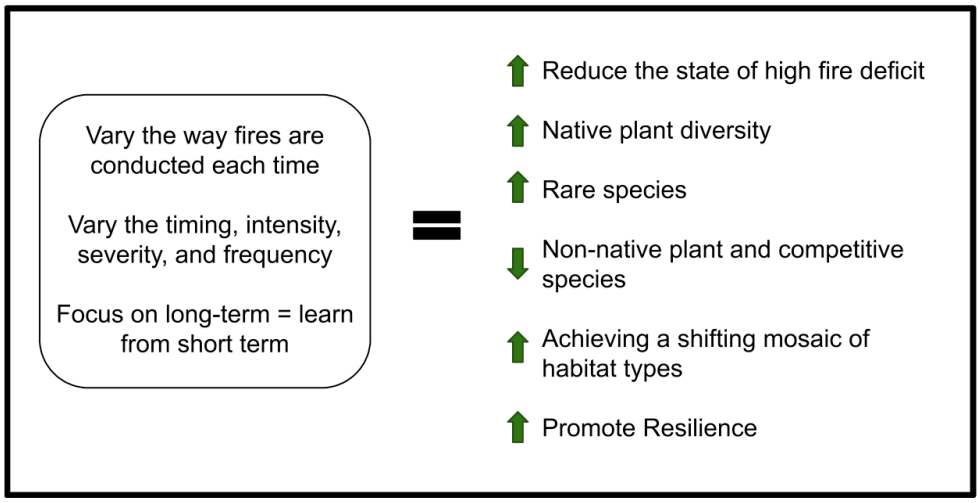


Figure 4.5. *How Pyrodiversity on multiple scales supports ecosystem resilience. Figure adapted from Mcgowan-Stinski, 2022.*

out that burning during the growing season results in burning plants in different phenological states, improving species diversity (Charland, 2023). While the effectiveness of growing season burns is an ongoing discussion, fire practitioners and scientists both agree that when pyrodiversity is utilized, a diversity of species on a community scale is supported (Jones & Tingley, 2022).

How Does Prescribed Burning Fit Into a Site's Management Plan?

An adaptive management approach to prescribed burning ensures that the application of fire on the landscape contributes towards the accomplishment of a site's overall Management Plan goal. A prescribed burn that is an isolated event does not help achieve the restoration of a critical ecosystem process, as excessively long fire return intervals do not align with historical fire regimes and enforce homogenous plant communities that do not support biodiversity (The Rangelands Partnership, 2023). Effective prescribed burning is part of an integrated burn program with consistent burning in combination with other management practices to achieve quantifiable outcomes. For example, prescribed burning may be promoting culturally important species (by x%), but it is one tool used alongside other tools, such as mechanical and chemical removal of unwanted vegetation, and even seeding native plants. Adaptive fire management allows space for review, adaptivity, and modifications in a prescribed fire regime (Howell, 2011). Because a land manager will implement a prescribed burn to achieve a specific set of objectives, it is essential to use science-based restoration techniques (Skowronski et al., 2021). A number of prescribed fire science organizations exist in the Michigan area to bridge the gap between science and management (Table 4.5). Consistent collaboration and review of BASI allow a fire practitioner to anticipate prescribed fire issues and achieve desired ecological management goals through evidence-based land stewardship (Michigan Prescribed Fire Council, 2023b). The adaptive management of prescribed burns in combination with the utilization of BASI in the fire practitioner community supports the accomplishment of Management Plan goals.

Table 4.1. *Organizations that foster interaction between scientists and fire practitioners to facilitate science-based prescribed burn management relevant to Michigan.*

ORGANIZATION	WEBSITE	DESCRIPTION
Michigan Prescribed Fire Council (MIPFC)	https://www.firecouncil.org/	Brings together practitioners, guides, and students of prescribed fire to provide a network through which information could be disseminated, partnerships could form and the use of prescribed fire would be protected.
The Stewardship Network (TSN)	https://www.stewardshipnetwork.org/	Building a diverse network of connected communities empowered to care for our environment together—now and forever.
US Forest Service - Rooted in Research	https://www.nrs.fs.usda.gov/rooted/	Delivering the latest science to support natural resource management and sustainability.
Tallgrass Prairie and Oak Savannah Fire Science Consortium	http://www.tposfirescience.org/	Designed to facilitate science-to-action and knowledge exchange about wildland fire among scientists, managers, policymakers, and other stakeholders.

NEXT STEPS: TRANSITIONING FROM *AD HOC* BURNING TO A COMPREHENSIVE BURN PROGRAM

In this chapter we have outlined how best available fire science and experience across organizations currently using burning can be integrated and applied in the use of a customizable Burn Plan Template, that takes into account species of concern, invasive species, and approaches to increase pyrodiversity. We conclude with recommendations for SMLC or any other entity seeking to ramp up their use of prescribed burning over time, in order to reintroduce fire to the landscape that historically supported local and regional biodiversity. To help entities visualize next steps on the path to a Burn Program, we organized our recommendations into three phases (Figure 4.6). The beginning phase, **Ad Hoc Burning**, describes an entity's initial conduction of prescribed burning on a few sites without a wider application. The transition to a **Burn Initiative** is a more coordinated, community-involved approach in maintaining consistent fire applications to accomplish overall management goals. A **Burn Program** is the transition to a more formalized approach that requires the authorization through an entity's Board with the support of the Executive Director and Staff to carry forth the objectives. These phased recommendations should be used in conjunction with building partnerships with indigenous communities (See Chapter 2: Understanding Anishinaabe Cultures and Histories to Build Respectful and Informed Fire Practice Partnerships), and more broadly engaging a diversity of stakeholders and partners (See Chapter 3: Engagement and Communication Planning for Fire Managers).

A burn crew at a controlled burn at Ives Road Fen Preserve | The Nature Conservancy

Prairie Burn in Nebraska | National Invasive Species Awareness Week

A torch used to ignite a prescribed burn | Noble Research Institute

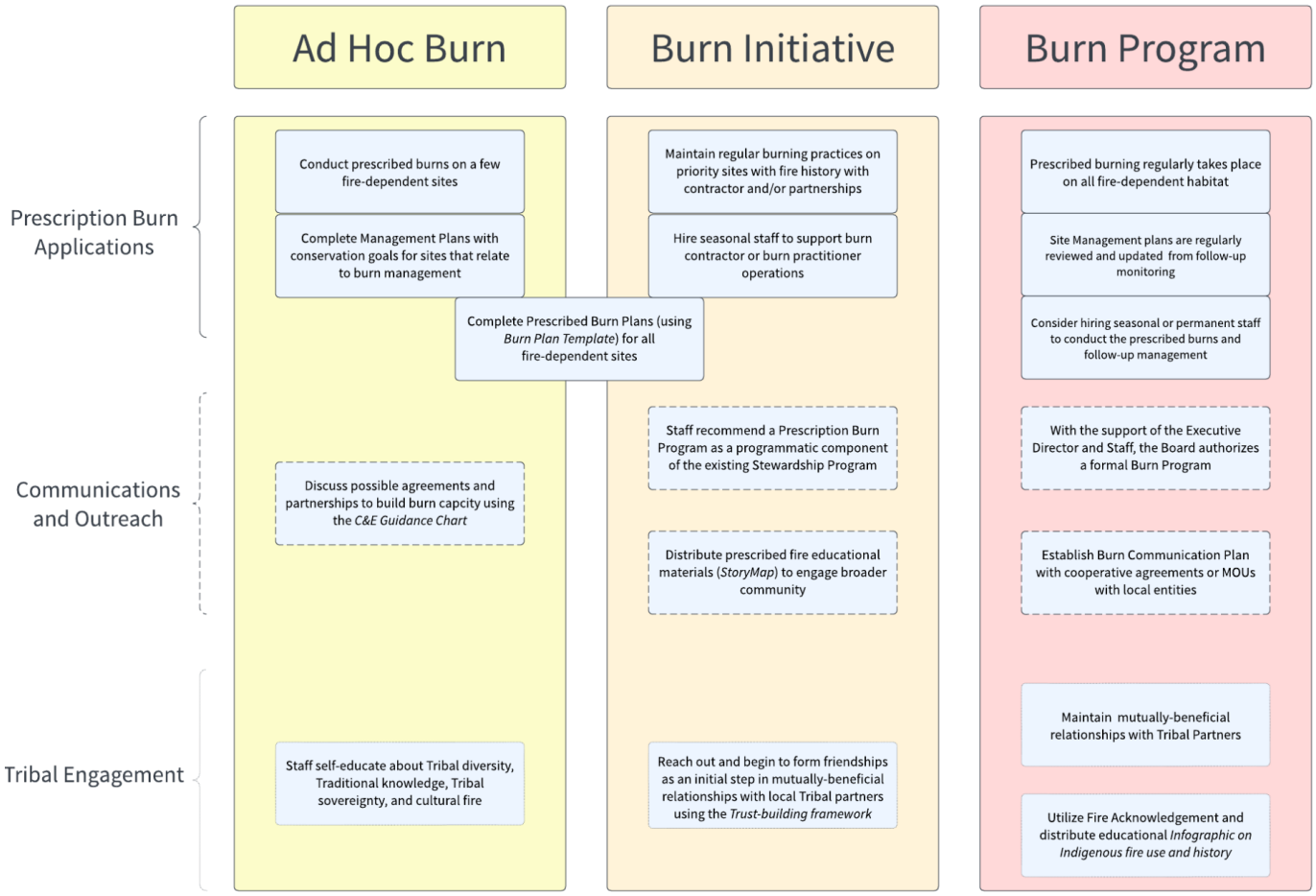


Figure 4.6. *Phased general recommendations for any entity's transition to establishing a Comprehensive Burn Program. Some recommendations are transitional, moving throughout different phases. It is important to note that these recommendations are based on our research and deliverables contained in this report, but can be adapted to the entity's resources, capacity, and starting point.*

Refer to (Appendix I) for an up-to-date and usable template.

PRESCRIPTION BURN PLAN TEMPLATE

Site Information		
Site Location		
Site name:		
Address:	County:	
City:	State:	Zip:
Fire Jurisdiction:		
Truck Access:		
Nearest Supplemental Water Source:		
Legal Description		
Section:	Township:	Range:
Site Ownership		
Name:	Phone:	

Contact Information	
On-Site	
Emergency Assistance: 911	
Burn Lead	
Name:	Phone:
On-Site Land Manager	
Name:	Phone:
Burn Crew Members	
Name:	Phone:
Name:	Phone:
Name:	Phone:
Other Numbers	
Off-Site	
Name:	Phone:
Name:	Phone:

Burn Prescription					
Site Description					
Burn Units:			Total Acreage:		
Slope & Aspect:					
Habitat Type:					
☐ Woodland	☐ Savanna	☐ Prairie	☐ Old Field	☐ Wetland	☐ Other
Vegetation Present:					
Unique Site Features:					
Important notes from previous burns:					
Fire Sensitive Species of Concern (see chart):					
Species	Habitat	Burn Season	FRI	Planning	
Range of Projected Burn Dates:			Actual Burn Date:		
☐ Any necessary burn permits are attached					
Burn Unit Map Preview (attach full page version to last page)					
Firebreaks (display on map):					
☐ Natural	☐ Roads	☐ Mowed	☐ Blown	☐ Other:	

Burn Objectives					
Check all that apply:					
☐	Reduction of wildfire risk and recycling of dead vegetation				
	☐ Reduce fuel load				
	☐ Reduce duff layer				
☐	Facilitate desired community type				
	☐ Prairie	☐ Woodland	☐ Rangeland	☐ Wetland	☐ Other
☐	Reduced (include spp. and desired % decrease if applicable)				
	☐ Non-native invasives				
	☐ Monoculture/dominant plants				
	☐ Woody encroachment				
	☐ Mesophytic plants				
	☐ Non-forage plants				
☐	Increase (include spp. and desired % increase if applicable)				
	☐ Fire-tolerant species				
	☐ Nutrient availability				
	☐ Light availability				
	☐ Forage plants				
	☐ Forbes				
☐	Increase quality of habitat for specific wildlife				
	☐ Ground-nesting birds				
	☐ Pollinators				
	☐ Amphibians, reptiles				
	☐ Endangered species				
☐	Disease or insect pest control				
☐	Promoting of culturally important species				
☐	Other:				

Pre-Burn Logistics

Prescribed Weather Conditions

	Range	Preferred	Actual
Temperature (°F)	40-80		
Relative humidity (%)	20-50		
Wind speed (mph)	5-25		
Fine Fuel Moisture Code	≥ 85, <92.5		
Wind Direction			

Site Preparation

Check all completed actions that apply:	Initials:
☐ On-site prescribed burn signage posted	
☐ Construction of fire breaks	
☐ Mechanical thinning of vegetation	
☐ Herbicide Applications	
☐ Protection of sensitive plant species	
☐ Other:	

Pre-Burn Notification List

☐ *Fire Departments*

Name:	Phone Number:	Date:
Name:	Phone Number:	Date:
Name:	Phone Number:	Date:

☐ *Police Department*

Name:	Phone Number:	Date:

☐ *City Government Departments*

Name:	Phone Number:	Date:
Name:	Phone Number:	Date:
Name:	Phone Number:	Date:

☐ *Adjoining Landowners*

Name:	Phone Number:	Date:
Name:	Phone Number:	Date:
Name:	Phone Number:	Date:
Name:	Phone Number:	Date:

Smoke Management Plan

Smoke Sensitive Areas:		
Identified Areas	Direction from Burn Area	Distance to Area
Smoke Management Actions:		

Go/No-Go Checklist		
Question	Yes	No
Have ALL permits been obtained?	☐	☐
Have ALL required notifications been made?	☐	☐
Have ALL the pre-burn preparations in the burn plan been completed and checked?	☐	☐
Have ALL the current and projected fire weather forecast been obtained and fit into the prescribed parameters?	☐	☐
Have ALL prescription parameters been met?	☐	☐
Are ALL smoke management specifications met?	☐	☐
Are ALL planned operations crew and equipment on-site, available, and operational?	☐	☐
Have ALL the availability of contingency resources been checked and are they available?	☐	☐
Have ALL crew members been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?	☐	☐
Can the prescribed burn be carried out according to the burn plan to meet the listed burn objectives?	☐	☐
Is a copy of the burn plan on site?	☐	☐
If all the questions were checked "Yes" proceed with a test fire. Document the current conditions, location, and results.		
Burn Leader Signature:	Date:	

Burn Implementation		
Crew Member Assignments		
Burn Boss:		
Igniters:		
Backpack Sprayers:		
PR:		
Weather Monitor:		
Smoke Monitor:		
Additional Roles:		
	Total Crew Count:	
Resources		
Equipment	# Available	# Needed
Backpack sprayers		
Flappers		
Fire rakes		
Council rakes		
Hard rakes		
Leaf blowers		
Drip torch		
Pulaski		
Chain saw		
Digital 2 way, UHF radio		
Signs (see map) Trail closing		
Signs (see map) Roadside		
Firing Technique & Ignition Plan		
Contingency Plan		

Post-Burn Logistics		
Observed Fire Behavior		
Flame height:	Speed of Spread:	Fire Intensity:
Mop Up Plan and Responsibilities		
Mop-up standards:		
Action	Crew Member Assignment:	Completed?
Complete mop-up and maintain close observation of the burned area until the fire is completely extinguished.		
Take immediate positive action to ensure safety of the fire should a dangerous change in the weather occur or be forecasted.		
Check perimeter for firebrand sources such as trees, posts, logs, etc.		
Contact fire department and any other notifications when burn area is completely extinguished and burn crew is leaving.		
Site Evaluation		
Percent of area burned:		
Notes for next burn:		
Photo Monitoring		
Check the following list after successful photo capture:		

	Point Number	GPS Coordinates	Direction of Photo	Landscape Reference	Additional Notes
☐					
☐					

☐					
☐					
☐					

Signatures	
Burn Leader Signature:	Date:
Organization Lead:	Date:

Prescription Burn Plan Template created in April 2023 by University of Michigan School for Environment and Sustainability students Allegra Baird, Anna McAtee, Vince Salgado, and Foster Woodruff, advised by Sheila Schueller, and based on burn examples from Michigan Prescribed Fire Council (MIPFC), University of Michigan Matthaei Botanical Gardens (MBGNA), City of Ann Arbor Natural Areas Preservation (NAP), Plantwise LLC, and Southeast Michigan Land Conservancy (SMLC) as well as information from National Wildfire Coordinating Group (NWCG) and Kalamazoo Nature Center (KNC). For more information and to download see https://seas.umich.edu/research-impact/student-research/masters-projects/prescribed-burn-program-best-practices-southern .

SOUTHERN MICHIGAN SPECIES OF CONCERN CHART & PRESCRIBED FIRE RECOMMENDATIONS

This document represents our current knowledge and experience to date. The following list of species was collected from surveys on Southeast Michigan Land Conservancy preserves and is not a comprehensive list of all species of concern in Southeast Michigan. Land managers implementing this species-specific guidance should incorporate their knowledge of the presence of multiple different species in the same habitat that may have differing burn recommendations. As the listed burn season is a recommendation based on life history traits of the species, the implementation of a prescribed burn is ultimately determined by the burn boss based on current site conditions. Blank cells represent information that is currently not available or known and suggest where more research is needed.

Last revised: April 3, 2023

Birds (Aves)

Species	Habitat	Burn Season Recommendation	Fire Return Interval (FRI)	Planning Notes
Henslow's Sparrow (*Centronyx henslowii*)	Weedy fields and meadows with an abundance of damp areas with tall grass and scattered shrubs	Summer Winter	2-3 years	Do not burn more than ¼ of habitat each interval.
Short-eared Owls (*Asio flammeus*)	Prairies, marshes, farmland, open country settings, small meadows	Fall Winter	Larger Units: 4+ years Smaller Units: 1 year	Do not burn more than ⅓ of habitat should burn annually
American Woodcock (*Scolopax minor*)	Early successional habitat, shrubby fields, forest edges, wet meadows, abandoned farmland with forest	Fall Winter	1-4 years	Avoid burning during nesting season (March - June)
Bobolink (*Dolichonyx oryzivorus*)	Tall grasslands, uncut pastures, overgrown fields and meadows, prairies, marshes, agricultural fields	Early Spring Fall	2-3 years	Avoid burning during breeding/fledging seasons (Mary - July)

Turtles (Testudines)

Species	Habitat	Burn Season Recommendation	Fire Return Interval (FRI)	Planning Notes
Eastern Box Turtle (*Terrapene carolina carolina*)	Forested habitats with sandy soils near a source of water	Early Spring Late Summer		
Blanding's Turtle (*Emydoidea blandingii*)	Ponds, marshes, swamps, bogs, wet prairies, slow-moving rivers, lake shallows and inlets	Early Spring Late Fall		Burn while fuel moisture is relatively high and using less-intense firing patterns to create patch mosaic
Spotted Turtle (*Clemmys guttata*)	Shallow bodies of standing or slow-flowing water with muddy bottoms and aquatic vegetation	Late Fall	2-6 years	If nesting areas are nearby, exclude adjacent forest and forest edge

Butterflies & Moths (Lepidoptera)				
Species	**Habitat**	**Burn Season Recommendation**	**Fire Return Interval (FRI)**	**Planning Notes**
Poweshiek Skipperling (*Oarisma poweshiek*)	Prairie fens, grassy lake and stream margins, moist meadows, sedge meadow, native prairie	Early Spring	4-6 years	Alternate rotational burns with mowing Do not burn more than ¼ of the habitat annually
Karner Blue (*Lycaeides melissa samuelis*)	Habitats with wild lupine (Lupinus perennis), sandy soils with oak or oak-pine savanna, old fields, and close-canopied oak forest	Spring* Fall* *See HCP Users Guide for site-specific guidance	5-10 years	Divide sites into 3 or more burn units- adjacent units are not burned in successive years Do NOT burn in areas where Karner blue occupy lupine Use natural or mowed burn breaks, do not use mineral breaks
Blazing star borer moth (*Papaipema beeriana*)	Variety of communities from wet to dry (lakeplain prairie, sand prairie, etc.) and present where larval host plant (Liatris spp.) resides	Summer	3-5 years	Protect adequate amount of foodplant Do not burn adjacent units in consecutive years, as there is high mortality of eggs during fall, winter, and spring burn units. Monitoring during the growing season is critical when planning to implement prescribed burns.

Snakes (Serpentes)				
Species	**Habitat**	**Burn Season Recommendation**	**Fire Return Interval (FRI)**	**Planning Notes**
Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)	Wetlands (spring, fall and winter), drier upland open sites (summer) with occasional patches of shade	Early Spring Burns: Only in upland sites Late Fall Burns: Ideal after several hard frosts and when ground temperatures have reached 50 degrees F.	2-6 years	If the site is small and you have enough help, you can sweep through the burn unit to "push" the snakes outside the unit to expand possible burn seasons and areas.
Butler's Garter (*Thamnophis butleri*)	Open to semi-open wetlands, railroad embankments, roadsides, short vegetation, wetlands and dense grass cover	Extremely site-specific and cannot be generalized for all burning prescriptions.		
Kirtland's Snake (*Clonophis kirtlandii*)	Open wetlands, openings or along edges of forested wetlands and floodplains, open habitats near urban centers such as grassy parks, cemeteries, and vacant lots	Late Fall Winter	3-5 years	
Eastern Fox Snake (*Pantherophis gloydi*)	Emergent wetlands along Great Lakes shorelines and associated large rivers and impoundments, drier habitats such as farm fields, pastures, woodlots, and residential properties near water	Fall: Only on days when snakes are unlikely to be above ground (cloudy/overcast days with air temperature below 55F). Winter		

Salamanders (Urodela)				
Species	**Habitat**	**Burn Season Recommendation**	**Fire Return Interval (FRI)**	**Planning Notes**
Marbled Salamander (*Ambystoma opacum*)	Moist lowland forests, but can also occur in upland forests and dry, forested rocky hillsides	Winter: During hibernation	Mimic natural historic fire frequency in area and adjust based on salamander abundance.	Avoid prescribed burns while salamanders are migrating to vernal pools in late winter or early spring. Do not use fire-suppressant chemicals on amphibians or on downed woody debris. Instead, make burn breaks around fallen logs and stumps by blowing or raking leaves.
Small-mouthed salamander (*Ambystoma texanum*)	Forested bottomlands and associated wetlands adjoining floodplains, may venture to prairies and farm fields.			

Species of Concern Chart created in April 2023 by University of Michigan School for Environment and Sustainability students Allegra Baird, Anna McAtee, Vince Salgado, and Foster Woodruff, advised by Sheila Schueller, and based on a culmination of research summarized here. For more information and to download see https://seas.umich.edu/research-impact/student-research/masters-projects/prescribed-burn-program-best-practices-southern .

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APPENDICES

Chapter 2: Understanding Anishinaabe Cultures and Histories to Build Respectful and Informed Fire Practice Partnerships

A) Infographic - "Life From Ashes: Learning From Indigenous Fire Use to Heal Neglected Ecosystems"
B) Clan Diversity in Anishinaabe society
C) Annotated Bibliography for Tribal Outreach Guide
D) Summary Document of Tribal Outreach and Traditional Knowledges
E) Evolving History Document for Tribal-Colonial Relations

Chapter 3: Communication and Engagement Planning for Fire Managers

F) Example Neighbor Burn MOU agreement, provided by MBGNA
G) Learn and Burn Evaluation Template, provided by https://sites.cnr.ncsu.edu/southeast-fire-update/learn-burn-workshops/
H) SMLC 2022 Communications Survey and Results

Chapter 4: Developing an Effective and Informed Prescription Burn Plan

I) Prescription Burn Plan Template
J) Southeast Michigan Species of Concern Chart & Prescribed Fire Recommendations
K) Species of Co Species of Concern Research