

OPPORTUNITIES FOR INDIGENOUS FIRE STEWARDSHIP IN ONTARIO'S
POLICY FRAMEWORK

by

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STATEMENT OF POSITIONALITY

I engage with this topic as a non-Indigenous settler living and learning on the traditional lands of the Anishinabek and the traditional territory of Fort William First Nation, signatory to the Robinson-Superior Treaty of 1850. I grew up on the unceded, unsurrendered territory of the Anishinaabe Algonquin Nation in Ottawa. My research and interest in Indigenous fire stewardship concerns my passion for the urgent need that concerns conservation of the land, the ever growing awareness of the negative accounts of relationships between Indigenous people and the government as well as the necessity meaningful reconciliation. My experiences as a student are enriched by ongoing relationships that I have developed with both Indigenous and non-Indigenous communities. My goal is to draw attention to obstacles that prevent people from engaging in cultural exchange, but I am aware that I am not in a position to speak about the aims and values of specific Indigenous Nations.

ABSTRACT

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Keywords: Ontario, Policy, wildfire, Indigenous fire stewardship, cultural burning, wildfire management, reconciliation, Indigenous, suppression, government.

Indigenous people have used fire as a tool for thousands of years for resource management, community protection, and cultural purposes. The criminalization of the practice during colonization in combination with a history of government fire suppression policies has contributed to a loss of culture and knowledge of cultural burning in Ontario. The publishing of information on cultural burning has been approached cautiously by Indigenous people because of the risk of non-Indigenous people adopting practices and using them inappropriately, thereby reducing their effectiveness. Presented in this thesis are the history of Indigenous fire stewardship, its benefits, and Ontario's current wildfire policy framework. Current barriers to Indigenous Fire Stewardship are explored to recommend areas of Ontario's policy framework where amendments could support and increase cultural burning practices.

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1. INTRODUCTION AND OBJECTIVES

Indigenous peoples have used fire as a tool for resource management, community protection, and cultural purposes for thousands of years (Hoffman et al. 2021). Europeans came to North America as early as the fifteenth century and brought with them their folk knowledge that forest fires were devastating and dangerous to humans, a view that was in contrast to the traditional knowledge of the Indigenous inhabitants who appreciated the benefits of burning and were adept at applying fire technology (Kimmerer 2001). British Columbia was the first province in Canada to ban cultural burning through the Forest Fire Act of 1874, and other provinces followed in the early 20th century (Boutsalis 2020). The effects of fire suppression are well documented for ecosystems throughout North America (Kimmerer 2001). The absence of fire in the landscape has altered the distribution of age classes, stand composition, their structure, and the accumulation of abnormal fuel loads. Landscapes are now more suited for destructive, uncontrollable wildfire activity as a result of these changes (Graham et al. 1999). Despite growing concerns about the risk of wildfires and stated intentions to establish Indigenous peoples as partners in wildfire management, the continued impact of colonialism has posed significant barriers to Indigenous peoples in participating in and leading cultural burning (Ray et al. 2012).

Wildfire management agencies in Canada are showing a renewed interest in using prescribed burning to reduce wildfire risk, but it is important to note that prescribed burning is different from cultural burning (Hoffman 2022). Both kinds of burns are different practices even though they both involve the planned and controlled application of fire to a particular land area. Compared to cultural burning, which

includes a variety of resource management principles, prescribed burning frequently has different goals. Prescribed burning is mainly used to manage and reduce the amount of forest fuels, to preserve a particular forest state, or to lower the risk of wildfires. It frequently takes place at various times, with greater intensity, and with different planning. First Nations reserve the right to conduct cultural burnings on reserve areas, but in many cases, considerable oversight by wildland fire agencies is required and this leads to tensions when burning occurs without formal governmental approval (Hoffman 2022). Joint governance and burning rights across regions, including areas covered by historic and modern treaties, have not yet been fully realized by provincially run wildfire agencies (Hoffman 2022). Indigenous fire knowledge in places like British Columbia, Australia and California are revitalizing Indigenous Fire Stewardship, creating opportunities for Indigenous communities. In Ontario, Indigenous fire stewardship has not been revitalized yet and current policies pose barriers to practice cultural burning. There are policies regarding prescribed burning, but this practice has differences in comparison to cultural burning in a multitude of ways including purposes, frequency, organization, scale, and intensity.

1.1 OBJECTIVES

The purpose of this thesis is to explore opportunities for Indigenous Fire Stewardship within Ontario's policy framework. The objectives of this research include introducing the concept of Indigenous fire stewardship from a historical perspective, highlighting the benefits of Indigenous fire stewardship, summarizing Ontario's policy framework relating to fire and drawing comparisons between other jurisdiction regarding cultural burning practices in an effort to identify opportunities to amend Ontario's framework.

2. METHODS

From September 2022 to March 2023, I conducted a review, analysis and synthesis of existing Indigenous and non-Indigenous fire literature worldwide with a focus on Ontario. Despite appeals for further research in the area and a need to accommodate Indigenous knowledge holders in academic publishing, there is minimal literature on the subject. Few studies have been published by Indigenous people, and even fewer by Indigenous people documenting the knowledge of their own Nations, (Christianson et al. 2022).

Included in my review are 81 resources relating to fire. Figure 1 shows a pie chart demonstrating the types of publications that I have used, organised by sources (government, website/podcast, books, peer reviewed by/with Indigenous authors, and without Indigenous authors). The chart shows that most resources were peer reviewed articles by non-Indigenous authors. The papers that I found touched on subjects relating to revitalizing Indigenous fire stewardship, the benefits of fire to the landscape, the history of cultural burning, the history of colonization and its effects on cultural burning practices, current practices of Indigenous fire stewardship and policies relating to fire in Ontario and in other jurisdictions. Once I chose my topic, I undertook my research to explain why cultural burning is so crucial by describing its history and advantages. I then looked into all the policies that are in place for fire in Ontario to assess what is missing from Ontario's framework and identify barriers. As part of this study, I met with personnel from the department of prescribed burns of the Ministry of Natural Resources. In my research I also found some studies identifying barriers to Indigenous fire stewardship in other jurisdictions and in Canada as a whole; this helped me identify similarities between jurisdictions that had similar barriers. As I researched my topic, I

identified needs, priorities, and objectives to support Indigenous fire stewardship in Ontario. I discovered examples of successful Indigenous fire stewardship in policy frameworks from British Columbia, Australia, and California, which enabled me to identify gaps in Ontario's policy framework and suggest potential changes.

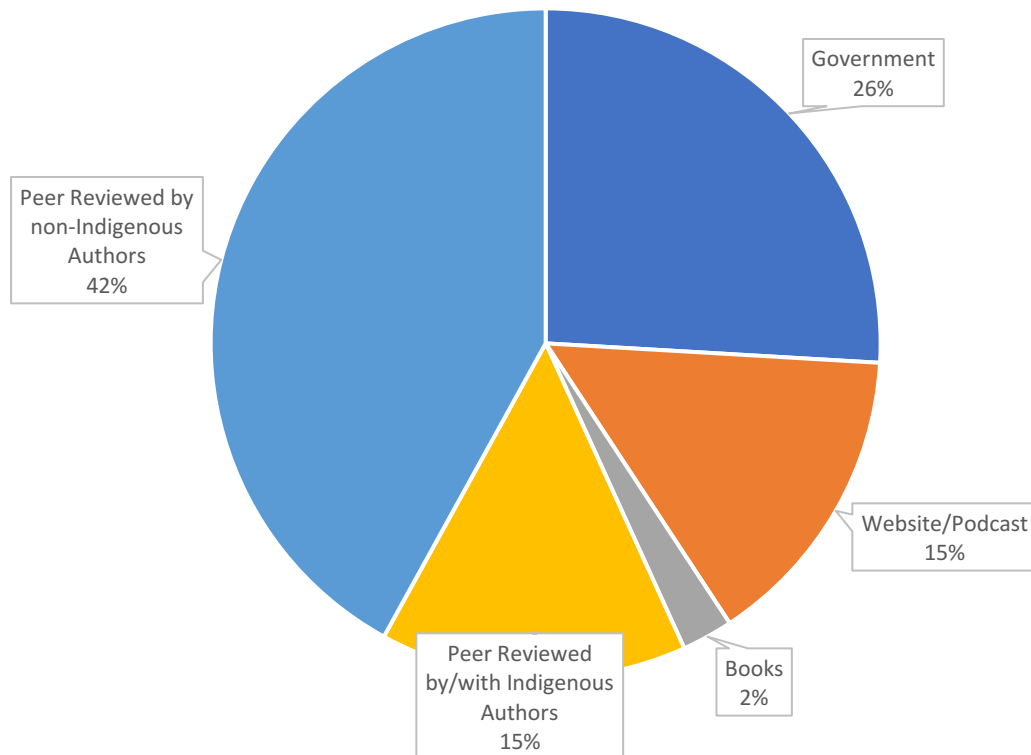


Figure 1: Pie Chart showing types of publications reviewed for this thesis.

3. LITERATURE REVIEW

3.1 Indigenous Fire Stewardship

Definition: Indigenous fire stewardship (IFS) is the use of fire by Indigenous peoples to: (1) modify fire regimes, adapt to, and respond to local environmental conditions, and promote desired landscapes, habitats, and species; and (2) increase the abundance of preferred resources to sustain knowledge systems, ceremonial and subsistence practices, economies, and livelihoods (Lake and Christianson 2019).

IFS refers to the transmission of knowledge, values, and behaviours among fire-dependent cultures regarding fire regimes, fire consequences, and the function of cultural burning in fire-prone ecosystems and habitats over generations (Lake and Christianson 2019). Additional terms like Indigenous fire management, Indigenous burning, traditional burning, and cultural burning are synonymous with IFS (Long et al. 2021). According to Clark et al. (2021), cultural burning is the “purposeful use of fire by a cultural group (e.g., family unit, tribe, clan/moiety, society) for a range of purposes and consequences”. Practitioners point out that as part of a tradition of good land care, cultural burns are typically preceded by thorough site preparation and followed by monitoring and associated cultural practices (Long et al. 2021).

The practice of cultural burning in Ontario dates back to thousands of years and has been utilized by Indigenous communities for a variety of purposes, including land management, hunting, and cultural and spiritual practices (Barry and Mandamin 2018). One example of the use of cultural burning in Ontario is the practice of "wabinakisi," which is a term used by the Anishinaabe people to describe the process of setting-controlled fires to clear underbrush and promote the growth of certain plants (Barry and

Mandamin 2018). Wabinkisi has been used by the Anishinaabe for thousands of years to manage the land and maintain biodiversity (Barry and Mandamin 2018). Another example is the use of fire to manage the landscape for hunting purposes (Dent and Luedee 2015). The Mississauga people, who inhabited the Lake Ontario region, used fire to clear the underbrush and promote the growth of certain plants that were important for the survival of game animals (Dent and Luedee 2015). By creating open areas in the forest, the Mississauga were able to improve their success in hunting and provide for their communities (Dent and Luedee 2015).

3.2.1 The Suppression of Indigenous Fire Stewardship

Indigenous peoples in many cultures around the world have used fire as a means of survival. Beyond the use of fire for cooking, fire has been used to adapt to local environmental conditions, to promote desired habitats and species, and to increase the abundance of preferred resources and landscape conditions when faced with changing climatic conditions across a wide range of ecosystems over millennia (Christianson et al. 2022, Lake and Christianson 2019).

Historically, settler governments in North America and in Australia criminalized Indigenous fire practices, thereby disrupting the land use practices of Indigenous peoples (Christianson et al. 2022). This suppressed the knowledge of the Indigenous people who had long understood the benefits of fire and were adept at applying fire technology (Kimmerer and Lake 2001). In Canada, British Columbia (B.C.) became the first province to ban cultural burns with the Bush Fire Act of 1874, with other provinces following suit in the early 1900s (Boutsalis 2020). Similar to the Potlatch ban, which the federal government implemented in 1884, the burning ban aimed to remove ceremony

and assimilate Indigenous Peoples (Boutsalis 2020). The Bush Fire Act of 1874 provided for fines or imprisonment if any unattended fire escaped during the period from June to September and resulted in damage to private or Crown land (Parminter n.d.). The Bush Fire Act included all fires, including cultural fire. According to the 1911 Report of the Superintendent of Forestry for B.C., a chief fire warden and fire rangers suppressed forest fires and spread the messages of fire prevention by posting notices at trading posts translated into “Indian” languages (Boutsalis 2020). People caught burning were subject to a \$100 fine, the equivalent of about \$2,200 today, or three months in prison (Boutsalis 2020). These actions led to long-term impacts on both Indigenous Nations and the natural landscape, that continue to be felt to this day (Christianson et al. 2022). The suppression of fire used as a traditional and common management practice can be viewed as cultural severance, defined as an act of functionally disrupting the relationship between people and land (Christianson et al. 2022). The impacts of cultural severance include loss of valuable biocultural components, broad successional shifts in landscapes, possible declines in unique biodiversity, declines in wildlife populations and culturally significant plants, and even the facilitated spread of invasive species (Christianson et al. 2022). In the specific context of man-made fire, the impacts of cultural severance can also increase vulnerability to catastrophic fires through increase fuel accumulation and continuity (Christianson et al. 2022). The fire ban, including cultural burning imposed by the settler regime was consistent with broader strategies aimed at criminalizing relationships between Indigenous peoples, land, and each other (Christianson et al. 2022). Examples of other strategies include regulating travel to their land; enforcing settlement; expulsion of Indigenous people from their historical territory; establishing,

maintaining and controlling reserve systems; and residential schools (Christianson et al. 2022).

One of the impacts of assimilation efforts on Indigenous peoples has been to disrupt the transmission of Indigenous knowledge (Christianson et al. 2022). Intentional federal and provincial policies that forbade cultural burning and expelled Indigenous peoples from their homes and lands caused disruptions in intergenerational knowledge transfer and continuity, weakened subsistence stewardship methods, and led to the loss of knowledge keepers (Fernandez-Llamazares et al. 2021)

3.1.2. Benefits of Indigenous Fire Stewardship

Indigenous fire stewardship has a range of benefits for both people and the environment. By working with fire in a way that honors traditional ecological knowledge and cultural practices, Indigenous communities can improve forest health, reduce the risk of catastrophic wildfires, and enhance the growth and diversity of plant and animal species. In addition, engaging in fire stewardship can help Indigenous peoples maintain their cultural traditions and strengthen their connection to the land. Ultimately, Indigenous fire stewardship is a powerful tool for promoting ecological resilience and supporting the well-being of both human and non-human communities.

Fires were intentionally set by Indigenous people to serve a variety of purposes, from clearing village sites to sending long-distance signals (Kimmerer and Lake 2001). Lewis (1993) documented over 70 uses of fire, including felling trees, clearing walkways, fireproofing settlements, and hunting. In Ontario, Indigenous people used fire to promote early succession forests better suited to their needs (Christianson et al 2022). Pikangikum First Nation is an Anishinaabe [Ojibwa] community with about 2300

residents (Miller et al. 2010). Geographically remote, the community is reachable only by plane, boat, or 80 km of winter road after freeze-up (Miller et al. 2010). Pikangikum First Nation recognizes that fire can not only destroy life but can also be the source of life (Christianson et al 2022). Open burning has also been used to reduce the population of pests such as rodents and biting insects, collect edible insects such as pandora moths and grasshoppers, and increase the yield of acorns, which are easier to harvest after burning (Kimmerer and Lake 2001). Riparian areas were commonly torched to attract wildlife to new grass and tree shoots (Kimmerer and Lake 2001). Burned areas quickly attract new plants and animals, provide new growth and food opportunities, and have other effects on forest renewal (Christianson et al 2022). The people of Pikangikum First Nation also use fire to create gardens and blueberry fields using different techniques depending on location and destination, control undergrowth vegetation, increase hunting visibility, and keep campsites away from undergrowth (Christianson et al 2022). Cultural burns are commonly used in basket plant management to achieve a uniform harvest of straight, thin shoots and roots (Kimmerer and Lake 2001). From crop management to land management, fire has been a ubiquitous tool (Kimmerer and Lake 2001). Indigenous peoples used fire to alter the environment for their survival (Kimmerer and Lake 2001). The most important consequence of the use of fire was the intentional creation of mosaics of habitat patches that promote food security by ensuring diverse and productive landscapes (Kimmerer and Lake 2001). Multiple resource patches were created to improve food supply stability (Kimmerer and Lake 2001). Habitat diversity conservation mitigates the effects of natural variability in single food species and increases overall productivity (Kimmerer and Lake 2001). For example, fire was used to create prairies that attracted elk, deer, and other game (Kimmerer and Lake

2001). Indigenous people skillfully altered the mechanics of fire to create a series of forest openings in a succession of different stages of fire, increasing the variety and yield of game, berries, root crops, edible seeds, and medicinal plants (Kimmerer and Lake 2001). Plants and animals that benefit from fire include important Indigenous Cultural Species (CKS) (Christianson et al. 2022). These species help shape people's cultural identities, which is reflected in the fundamental role they play in diet, ingredients, medicine, etc./or spiritual practices (Christianson et al. 2022). These include moose, bison, and wild huckleberry, as well as numerous berry-producing shrubs, including various blueberry species that are important as edible and medicinal plants (Christianson et al. 2022). Indigenous people of the northern regions have used fire in myriad different ways to support the population of these and other CKS (Christianson et al. 2022). These include *Dunne zaa* burning along rivers and sloughs to improve forage and attract fur-bearing and game species, as well as Anishinaabe burning of aspen parkland to provide prairie habitat for bison. (Christianson et al. 2022).

One of the aspects of Indigenous fire stewardship that has received the least attention is non-material cultural services, yet they are crucial in understanding why Indigenous people insist on carrying out their own burning (Long et al. 2021). Indigenous people continuously pass on their knowledge as they engage in ritual, subsistence, and other domestic activities that allow for generational interchange (Long et al. 2021). Indigenous knowledge is obtained from observations of the environment, ecological processes, and species life histories and interactions (Huffman 2013). The accompanying knowledge and social structures are likely to disintegrate when environmental circumstances deteriorate to the point where they no longer sustain conventional life ways (Long et al. 2021). Cultural fires are a method for stopping this erosion since they bring together

people from various tribal communities who share their expertise in managing resources and using fire while also reinforcing shared responsibilities (Long et al. 2021). Such fires are lighted to open spaces and make them safer so that older people and children can reach them more easily (Long et al. 2021). Burning and related stewardship practices preserve culturally significant traditions, such as place-making and intergenerational learning (Long et al. 2021). Anishinaabe of Pikangikum First Nation Elders, described fire in relation to a larger cosmological reality, conferring agency to beings like *beenaysee eshkotay* or thunderbirds, and the process of burning itself (Christianson et al. 2022). They perceived forest fires as beings “which possess agency and who intentionally create order in landscapes” (Christianson et al. 2022) Elders also discussed fire as an expression of agency, a process capable of growth, travel, and both a source of destruction and renewal (Christianson et al. 2022). Resting at night and active in the day, fire is understood as a living component of the landscape (Christianson et al. 2022).

3.1.3 Current Practices

Globally, wildfires are getting worse and more unpredictable due to anthropogenic factors like climate change. The use of cultural fire to lower wildfire danger is gaining renewed interest from various jurisdictions all over the world. Indigenous fire management is being revived through various projects like workshops, training exchange programs, and support from governmental agencies in locations like British Columbia, California, and Australia. Cross-cultural collaboration and knowledge exchange about the requirements and difficulties faced by practitioners are more

important than ever as non-Indigenous people increasingly understand the significance of cultural burning.

In British Columbia, the governments of the Xwisten Nation, Shackan Indian Band, and Yunesit'in are now working on initiatives to revive traditional burning customs (Lake and Christianson 2019). FNESS's Forest Fuel Management (FFM) Department worked with the Shackan Indian Band, Xwisten (Bridge River) First Nation and Yunesit'in National Government exploring climate change issues (e.g., wildfires and drought) in their respective First Nations communities (FNESS 2022). This project received multi-year financing from Indigenous Services Canada's First Nation Adapt Program (FNESS 2022). This project was distinctive because it used qualitative research techniques influenced by Indigenous knowledge to determine each participating community's traditional burning knowledge and analyze climate change vulnerabilities (FNESS 2022). The project's capacity building efforts included integrating climate change risks (such as droughts and wildfires) into wildfire mitigation, which resulted in the joint creation of community-based burn plans based on Indigenous cultural values and associated burning practices and non-Indigenous prescribed fire practices (FNESS 2022). The Revitalizing Traditional Burning project is intended to inform policy makers, wildfire management specialists, crew leaders, land planners, and program managers in developing wildfire mitigation strategies that can maintain or enhance cultural attributes of First Nations communities (FNESS 2022).

An e-lecture conducted in November 2018 outlined details of the Burn Plan Framework for Xwisten Nation (2018). The project is a multi-year project and the team performed in-depth interviews in Xwisten for the purpose of recording oral histories about climate change and local burning customs (Xwisten Nation 2018). They

contributed to the creation of the Xwisten Fire Council, which brought together Elders with burning expertise on a regular basis to debate Xwisten values, needs, problems, and priorities (Xwisten 2018). Then, their team created a structure for a burn strategy depending on the community. In order to lessen the effects of climate change on the community, the Burn Plan took into account local indigenous values, knowledge, and climate change concerns with meteorological conditions (Xwisten 2018). Regulatory procedures, location selection (including land designating for Xwisten), topography, timber varieties, local ecology, weather consideration, partnerships, and resource requirements are all outlined in the plan (Xwisten 2018).

To manage wildfire effects, restore California's fire-adapted ecosystems, and mend the tense relationship between the state, its Indigenous peoples, and land management, cultural burning and controlled fire are crucial strategies (Clark et al. 2021). The use of managed fire reduces the size and intensity of upcoming wildfires, according to numerous research (Clark et al. 2021). Additionally, many of California's ecosystems depend on the cyclical application of fire, which enables the enhancement of wildlife habitat and efficient watershed and vegetation management (Clark et al. 2021). The Karuk, Yurok, North Fork Mono, and Tule River tribes, as well as Plains Miwok pyrogeographer Don Hankins, currently regularly carry out larger-scale cultural burning with cooperating agencies in California (Pfeiffer 2022). The Karuk Tribe in Northern California is concentrating on reintroducing fire to willow trees—the proper way—as part of its cultural burn plans (Tripp 2022). According to their creation myths, turtle handed fire to the frog, who then took it underwater and spit it into the roots of willow trees beside the river (Pfeiffer 2022). In order to safeguard turtles that are nesting in willow trees, tribal firefighters undertake nightly fires to maintain fire in the grasslands

(Pfeiffer 2022). Later, in the fall, they return to grassy places that can withstand wildfire embers and prepare a fine blackline to burn some good willows for the weavers (Tripp 2022).

The FireSticks Alliance Indigenous Corporation supports Indigenous fire stewardship throughout Australia by working to reinstate fire as a cultural activity carried out on traditional territory that is not subject to current colonial fire management regulations such as prescribed burning programs or restrictions. People have the chance to expand on their existing knowledge of Country through Firesticks and explore for innovative ways to apply new knowledge and technologies to promote cultural identity and practice (FireSticks n.d.). Building a community of practice, sharing fire tales, and promoting the work being done and its benefit to people and the environment are all things that Firesticks is doing (FireSticks n.d.). Through Firesticks, mentoring and networking, the community and the country are strengthened (FireSticks n.d.). The use of fire to improve ecosystem health in culturally interconnected landscapes enhances habitat connectivity and condition (FireSticks n.d.). In the end, Firesticks wants to enable both indigenous and non-indigenous groups to collaborate on creating resilient, healthy ecosystems (FireSticks n.d.) To develop a better knowledge of the ecological impact of cultural burning traditions, Firesticks is supporting training, carrying out on-the-ground activities, and performing scientific monitoring (FireSticks n.d.). The program's goal is to use fire to improve habitat quality and connectedness within culturally interconnected landscapes, which will improve ecosystem health (FireSticks n.d.). Firesticks' main objective is to encourage cultural learning pathways that give both Aboriginal and non-Aboriginal communities the ability and empowerment to collaborate on building resilient landscapes (FireSticks n.d.).

Another current practice in Australia, The Traditional Knowledge Recording Project (TKRP) program involved Kuku-Thaypan Elders George Musgrave and Tommy George and Vitor Steffensen recording, demonstrating, documenting, and utilizing their traditional knowledge to address key areas of concern for their community (Standley et al. 2009). The monitoring of a sacred lake area and story place based in the Lakefield National Park, the conducting of traditional burns to promote regrowth and prevent destructive large fires around ceremony and rock art areas, and the monitoring of waterways, lagoons, and fish stocks are all activities that have been documented (Standley et al. 2009). Through the University of California, the project has earned attention on a global scale for its fire management strategies (Standley et al. 2009). Kuku-Thaypan Elders have shown other groups how simple, dependable, and economical the TKRP and digital technology were to use. The project's methodologies have been adapted by Kuku-Yalanji, Djabugay, and groups from Aurukun, who are doing their own knowledge recording (Standley et al. 2009).

Studies and first-hand information from Indigenous people about cultural burning practices in Ontario are hard to come by. Individuals who oversee carrying out these procedures typically aren't eager to openly discuss them with others, especially in a setting where they will be publicized (pers. comm. Anonymous Jan 11, 2023). The ceremonial components of Indigenous practices are sacred. Publishing information about them runs the possibility of them being adopted by the non-Indigenous population, who then start using them, which has been done in the past. Because the non-Indigenous population is unaware of the ceremony components that go along with the practices, these rituals are eventually performed in the improper context, which has an impact on their efficacy (pers. comm. Anonymous Jan 10, 2023).

Although few cultural burning practices are documented, it is something that is happening actively in different Indigenous communities in Ontario. An example of this is the Six Nations of the Grand River near Brantford Ontario. Logan Hill, Mohawk of the Haudenosaunee, Turtle Clan from Six Nations has discussed using fire for as long as he can remember on his reserve (pers. comm. Feb. 9, 2023). Hill has used fire with his family for brush pile burning on their property and field burning in open areas for land management (pers. comm. Feb 9, 2023). In his experience, once burned, a field has many benefits for renewal of the plants, the soil, and the trees. His sister recently conducted a burn on her property to get rid of all the weeds and to renew the soil as she is building a home on the land. Hill recognizes that our forests and conservation areas are not healthy, and many could benefit from a burn (pers. comm. Feb 9, 2023). There is a lot of undergrowth and buildup of leaves which if burned, would release to create space for the soil and increase biodiversity. For the Haudenosaunee, taking care of Mother Earth is a big responsibility that they have. It is important that they be active in how they protect and care for Mother Earth. Fire is a way to take care of the land by recycling nutrients into the soil and supporting the growth of plant species used for food and medicine. Hill explains his personal experience with burning as being small scale. Fires are slow burning and it is always ensured that they are under control (pers. comm. Feb 9, 2023).

Miller et al. conducted interviews with Elders from Pikangikum First Nations who were eager to contribute to the study on Indigenous fire and indicated other people who they believed to be knowledgeable about the subject (2010). First, Elders desire dialogue and collaboration with the OMNR to develop fire management strategies that utilize their knowledge and values relating to fire. The perceptions and connections that

the Pikangikum Elders have with fire represent the distinctive Anishinaabe manner of thinking and speaking and are different from those held by other groups of Canadians (Miller et al. 2010). For instance, Pikangikum Elders were unsure of what English-speakers meant by the terms "wildfire" and "forest fire" during interviews with Elders and sessions with the OMNR (Miller et al. 2010). These words are impossible to translate into Anishinaabe. Elders believe that there are three different types of fire (eshkotay): the anishinaabe eshкотay, which is the fire that people initiate and manage; the beenaysee eshкотay, or thunderbird fire; or the wahmi-teegoshee eshкотay, or "whiteman" fire or electricity (Miller et al. 2010). People in Pikangikum are still knowledgeable about the various types of fire, their behaviours, and how they affect the regrowth of forests (Miller et al. 2010). Elders have given names and descriptions to several types of fires, including those that burn beneath the soil's surface, on the ground's surface, up and down hills, crown fires, and superficial surface burns (Miller et al. 2010). They explain how many of these flames are successfully put out and provide warnings to fire fighters as to when a fire is escalating dangerously (Miller et al. 2010). Elders also discuss the numerous benefits that freshly burned areas bring to livelihood pursuits like locations for berry-picking, moose hunting, and firewood-cutting (Miller et al. 2010). It will take ongoing communication between the community and the OMNR to incorporate understandings, livelihood activities like moose hunting, berry picking, and firewood gathering, and the values that these landscapes represent to the people of Pikangikum into fire management plans (Miller et al. 2010). Pikangikum artist captured the Elders' description of traditional burning in a painting (Figure 2).

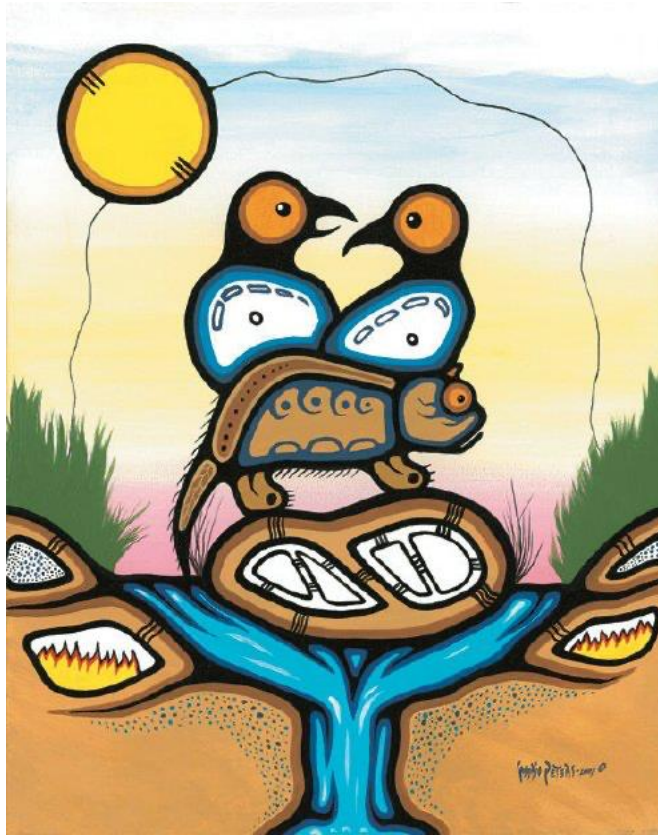


Figure 2. Painting portraying Elder's description of tradition burning (Peters 2007).

3.2 Policy Related to Fire

In recent years, there has been growing recognition of the importance of cultural fire and its potential as a tool for mitigating the effects of climate change, restoring ecosystems, and reducing the risk of catastrophic wildfires. As a result, there has been a push to develop policies and regulations that support and promote cultural fire practices and integrate Indigenous knowledge and expertise into land management decision-making processes. These policies aim to not only promote ecological and cultural sustainability but also to address social and historical injustices and promote reconciliation and healing. Different jurisdictions like British Columbia, California and Australia are using policy to facilitate Indigenous fire stewardship.

3.2.1. British Columbia

The First Nations Emergency Services Society (FNESS) is a charitable non-profit organization incorporated under the society act of British Columbia. Communities look to the FNESS with the help of the First Nation Leadership Council for assistance and delivery of crucial emergency and forest fuel management programs and services (FNESS 2023). To help First Nations before, during and after a crisis FNESS uses the Four Pillars of Emergency Management (Mitigation, preparedness, response, and recovery). The mitigation pillar includes the reduction of loss through protection and prevention programs, including cultural burning revitalization (FNESS 2023). FNESS has a Cultural and Prescribed Fire Specialist who supports and promotes the best cultural practices that a community can engage in. The member in charge of this position in British Columbia, Dave Pascal is part of Lil'wat Nation in Mount Currie (Pascal 2023). While providing funding and mentoring, FNESS ensures that Indigenous communities lead their cultural burning programs (Pascal 2023). They make sure that the projects are chosen and directed by the Indigenous communities (Pascal 2023). The communities have their own crews to complete the work, but because planning is a more challenging process, FNESS assists them (Pascal 2023). FNESS, which is a good example of an Indigenous specialist managing a project that supports cultural burning and has experience with it, is not a government organization but is backed by the government.

3.2.2 California

The Karuk and Yurok Tribes seized the opportunity to reintroduce cultural burning through formal partnerships and agreements when the USDA Forest Service and

the California Department of Forestry and Fire Protection (CAL FIRE) started allocating funds to prescriptive burning activities for fire and forest restoration in the twenty-first century (Marks-Block 2020).

Communities and fire managers in northern California are growing prescribed burning with success by leveraging modifications to federal and state rules and forming new organizations for prescribed fire advocacy and implementation (Marks-Block 2020). Some of the bureaucratic obstacles that tribes have to overcome are finally being eliminated as a result of the recent passage of SB 332 and AB 642, state bills that recognise cultural fire practitioners and cultural burning as distinct from prescribed burning and remove liability risks for tribes that would otherwise face penalties for starting prescribed burns on traditional lands (SB 332, AB 642). The Karuk and Yurok American Indian Tribes have started successful efforts to revive cultural burning by building polycentric, or inter-governmental and inter-institutional coalitions to manage fire across complex jurisdictional boundaries (Long and Lake 2018). Through the Prescribed Fire Training Exchanges (TRES), institutional support for cultural burning in northwest California was started in 2013 (Terence 2016). In 2014, the Six Rivers National Forest started the Roots and Shoots initiative on the Lower Trinity, Orleans, and Ukonom ranger districts (Colegrove 2014). The USDA Forest Service and The Nature Conservancy's Promoting Ecosystem Resilience and Fire Adapted Communities Together agreement includes the TRES program, which funds cooperative and collaborative burning on private, tribal, and public lands throughout the United States (Butler and Goldstein 2010). To assist intergovernmental, interagency, and civil society partnerships in the Karuk and Yurok territories, TRES provides financial and logistical support for the creation of burn plans, the processing of licenses, the provision of

equipment, and the mobilization of fire personnel. (Terence 2016). The Roots and Shoots project is an endeavour to burn 176 acres within 25 forest regions that include ecocultural elements important to indigenous peoples in the Six Rivers National Forest developed by the USDA Forest Service and Tribal members (Colegrove 2014).

In order to plan and carry out cultural burns on land under federal jurisdiction as well as privately owned and tribally owned properties, the Karuk Tribe's Department of Natural Resources (Karuk DNR) has invested and raised sizeable financial resources and established numerous partnerships with non-governmental and governmental agencies (Marks-Block 2020). To organize the Western Klamath Restoration Partnership, which aims to increase cultural burning within ancestral Karuk land under the control of the USDA Forest Service, the Karuk DNR specifically teamed with the Orleans Somes Bar Fire Safe Council (OSBFSC) (Marks-Block 2020). On the Yurok reservation, cultural fires are managed by the Cultural Fire Management Council (CFMC) in collaboration with the Yurok Tribal government, non-governmental groups, and the California Department of Forestry and Fire Protection (CAL FIRE) (Marks-Block 2020). The Nature Conservancy's Fire Learning Network and TREX, have both given crucial start-up financing and resources to the CFMC and Karuk DNR in order for them to form partnerships and carry out burns (Marks-Block 2020).

Additionally, the director of the Karuk Tribe's Natural Resources Department was named July 7, 2022, to the Biden-Harris administration's Wildland Fire Mitigation and Management Commission, which is tasked with recommending policies and strategies to better prevent, mitigate, manage, and recover from wildfire to Congress (Wear 2022).

3.2.3 Australia

In Australia, Indigenous ranger projects were first funded in 2007 (NIAA 2021). Indigenous ranger initiatives help Indigenous peoples of Australia conserve and manage their land, sea, and culture by fusing traditional knowledge with conservation education (NIAA 2021). This covers things like preventing bushfires, safeguarding endangered animals, and adhering to biosecurity regulations (NIAA 2021). In order to exchange expertise, interact with students, and create new revenue and jobs in the environmental, biosecurity, heritage, and other sectors, Indigenous ranger groups also form collaborations with research, education, charity, and commercial organizations (NIAA 2021). In Australia, 80 Indigenous ranger organizations will now get more than \$746 million over the course of seven years, until 2028 (NIAA 2021). More than 1,900 jobs for Indigenous people will continue to be supported by funding, which will also enable ranger groups to manage their land and marine territories more strategically (NIAA 2021).

The Department of Environment, Land, Water, and Planning (DELWP) in Victoria provided funding for the creation of the Victorian Traditional Owner Cultural Fire Strategy to assist Traditional Owner rights and interests in reintroducing cultural fire to the landscape (Forest Fire Management Victoria 2020). To support Traditional Owners in engaging in cultural burning for the variety of cultural values associated with caring for Country, the strategy helps give policy guidance and a framework across Victoria's fire and land management agencies (Forest Fire Management Victoria 2020).

For more than 50,000 years, fire management has been a cornerstone of the culture and environment in Arnhem Land (RCNDA 2020). The Western Arnhem Land Fire Abatement Project was created because of discussions between traditional owners

and scientists in the late 1990s about the significance of fire in the landscape (RCNNDA 2020). The project, a collaboration between the five Aboriginal ranger groups in charge of Western Arnhem Land, the Northern Territory Government, the Northern Land Council, scientists headquartered in the Northern Territory, and ConocoPhillips, started in 2006 (RCNNDA 2020). With the help of incentives for carbon farming, the project seeks to reestablish Aboriginal-led fire management regimes over the Arnhem Plateau (RCNNDA 2020). In northern Australia only, 32 savanna fire programs totalling 17.9 million hectares are being carried out by Indigenous people as of 2021. (The Nature Conservancy 2022). Since 2012, their work has reduced emissions by over 1 million tonnes annually, earning about \$95 million in Australian Carbon Credit Units (The Nature Conservancy 2022).

Numerous Indigenous peoples have taken care of Western Australia's vast and diverse land and environments (RCNNDA 2020). The Ngadju maintain the Great Western Woodland and put out uncontrolled fires using a variety of tactics, including cultural burning (RCNNDA 2020). These include gathering logs and sticks for the campfire and using broom bushes to clean up the trash (RCNNDA 2020). Sweeping is also used in the summer by cockatoos to keep goannas from scaling the trees to their nests by dropping flowers and leaves and removing rough bark (RCNNDA 2020).

3.2.4. Ontario

Only 6% of Canada's forestland is owned privately; the remaining 94% of Canada's land is managed by the federal government's institutions (national parks, First Nations reserves, and Department of National Defense lands), and the provinces and territories (Tymstra and Flannigan 2020). Concerning the management of wildfires on

federal territory, the federal government has agreements with the provinces and territories (Tymstra and Flannigan 2020). There are obstacles to using cultural burning on larger Indigenous territories, which are regarded as Crown land under the legal jurisdiction of provincial or federal governments (Hoffman et al. 2022). For instance, Natural Resources Canada (2020) claims that about 2% of Canada's forested land is "owned" by Indigenous Nations, but this statistic does not adequately reflect the complexity of ownership and jurisdiction, and the absence of titled lands which are the direct results of historical and ongoing colonization over vast and overlapping territories (Branch 2020). Provincially managed wildfire agencies have failed to completely realise shared governance and the ability to burn across territories, including those covered by ancient and contemporary Treaties. Indigenous lands as recognized by government can differ significantly from Indigenous territories described by Indigenous people (Figure 3).

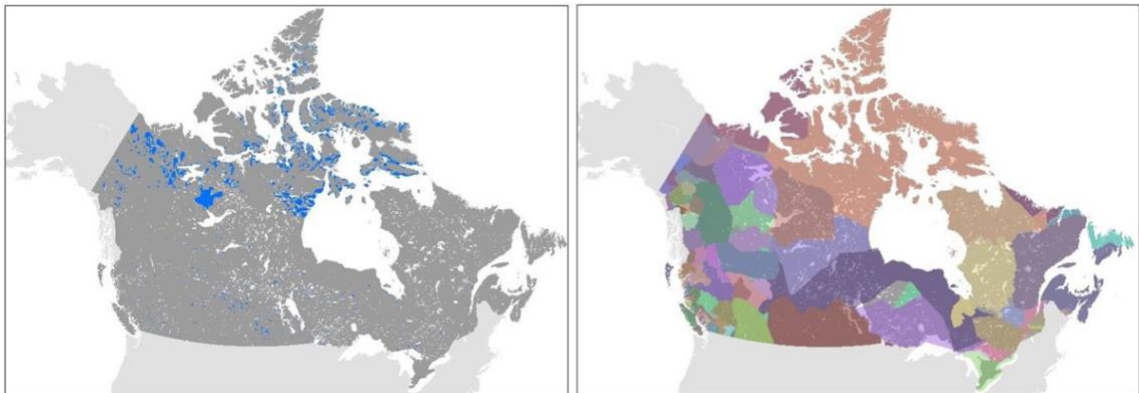


Figure 3: Province-recognized Indigenous lands in Canada (left) vs. Indigenous territories as described at native-land.ca (right). Reserves, settlement lands for land claims, and Indigenous lands are included in the data set "Aboriginal Lands of Canada Legislative Boundaries" that represents state-recognized territories. Each of the "traditional territories" represented by native-land.ca's maps is represented by a distinct color and includes overlap areas that lie within the borders of multiple countries (Artelle et al. 2019).

The Forest Fires Prevention Act establishes the fire season, where and when fire permits are necessary, penalties for violating the Act and its regulations, provisions for implementing restricted fire zones where outdoor burning can be restricted, declaration of emergency areas, orders for fire suppression, the safety and evacuation of people, and the duties of planning authorities with regard to the suppression of wildland fires within their jurisdiction (OMNR 2017). The lack of knowledge of the connection between Indigenous Peoples and fire among wildfire management organizations, decision-makers, and the public is one of the largest obstacles to practising Indigenous fire stewardship (Lake et al. 2017). Knowing the intricacies of fire, including when, how, and where it should or shouldn't be used, is necessary for cultural burning to preserve desired ecological structures and increase species diversity and productivity for food, medicine, and ceremonial purposes (Kimmerer and Lake 2001). Contrary to popular belief, Indigenous fire stewardship is a dynamic knowledge system that changes in response to shifting environmental conditions (Thomassin et al. 2019). Even though government organizations are becoming more interested in cultural heritage, it is crucial to remember that Indigenous knowledge is based on connections and experience, is manifested in behaviour, and is ingrained in language and the land (Hoffman et al. 2022). Traditional fire knowledge, according to Huffman (2013), is "fire-related knowledge, beliefs, and practices that have been established and utilized on specific landscapes for specific reasons by long-time residents." As a result, Indigenous

knowledge cannot be "taken" and added to plans by organizations to help manage wildfires (Hoffman et al. 2022). When Indigenous knowledge is removed from the Nation and the place that it was developed on, it is contextualized and becomes useless (Hoffman et al. 2022).

Under Section 5 (2) O. Reg. 230/00 s. 3 of the Forest Fires Prevention Act , it mentions that an officer may issue a permit to a person for a fire outdoors in a restricted fire zone if the officer is satisfied that the fire can be made, tended, and extinguished safely, and is necessary for *a ceremonial event* or because of special circumstances (OMNR 2018). The only fire-related legislation in Ontario that refers to cultural fire is this one. This is significant because the Forest Fires Prevention Act stipulates that if an Indigenous person wants to burn for a ceremonial event, they must first obtain an officer's approval. Frequently, wildland fire departments attempt to appropriate and misrepresent Indigenous fire use (Marks-Block and Tripp 2021). This is problematic as

3.2.4.1 Prescribed Burning

The Ontario government describes a prescribed burn as the deliberate use of fire in a specific area under certain conditions to accomplish forest management, wildlife management, hazard reduction and other land and resource management objectives (Ontario 2022). The Prescribed Burn Policy in Ontario is comprised of The Natural Resource Management Legislation and Policy and the Forest Fires Prevention Act R.S.O. 1990. The Policy combines the two provincial documents to produce the Prescribed Burning Operations Policy.

Hazard reduction is the oldest use of prescribed fire. It is characterized as the treatment (i.e. burning) of both living and dead forest fuels with the goal of reducing the

risk of a fire beginning, or reducing the potential rate of spread and resistance to control if a fire were to begin (Weber and Taylor 1992). Official records show that fire was used to reduce forestry debris in Ontario as early as 1917 (Weber and Taylor 1992). The use of controlled fire as a management tool for any purpose was not formally codified as a policy directive until 1962 due to the slow pace of the development of the policy (Weber and Taylor 1992). It took a further ten years before a modified policy endorsing and promoting the use of prescribed burning as a management tool was announced (Weber and Taylor 1992). Only interested personnel in a few parts of Ontario kept slash burning alive throughout the ensuing years (Weber and Taylor 1992).

In the 1980s and 1990s, the Ontario Ministry of Natural Resources and Forestry and the Canadian Forest Service participated in experimental burning and broadcast burning over cutovers as a silviculture tool (Pistilli pers. comm. Dec. 7, 2022). Sadly, a few large, prescribed fire eventually turned into wildfires when control was lost during managed burn operations (Pistilli pers. comm. Dec. 7, 2022). There was a prescribed burn that escaped in the middle of the 2000s, which forced all prescribed burns in Ontario to be suspended (Pistilli pers. comm. Dec 7, 2022). The policies and manuals were revised as a result to include far more oversight and be much more risk averse (Pistilli pers. comm. Dec 7, 2022). As the operators of the controlled burn program at the time were extremely risk averse to a prescribed burn triggering a wildfire in Ontario, a clause was added to the prescription burn policy regarding cost accounting to limit the number of prescribed burns in Ontario (Pistilli pers. comm. Dec 7, 2022). The section states that the complete cost of preparation and execution should be borne by the proponents of the prescribed burn and their collaborators (Ministry of Natural Resources 2011). The AFFES may make an "in-kind" contribution toward the price of a prescribed

burn up to a maximum of twenty percent of the cost (Ministry of Natural Resources 2011).

The Ministry of Natural Resources is now not encouraged to perform prescribed burns, though some are occasionally carried out with extreme caution. Prescribed burns are not highly promoted since, as was already said, the province provides very little funding for them and because in the past, escaping prescribed fires have significantly damaged the surroundings.

3.2.4.1.1. Laws/Rules and How to Apply

By law, in Ontario, anyone that wants to conduct a prescribed burn needs approval from the Ministry to burn on land managed by the Ministry and when the Ministry is involved in the planning or delivery of the burn (Ontario 2022). If you plan a burn, the entire expense of preparation and execution is your responsibility and that of your collaborators (Ontario 2022). Operators of prescribed burns must make sure that safeguards are in place to protect their workers, partners, assets, and the public (Ontario 2022).

Indigenous fire practitioners must frequently show confirmation of accredited prescribed fire expertise and carry prescribed fire liability insurance. Indigenous Nations and communities are accountable for all liabilities relating to cultural burning, which instills anxiety that, in the unlikely event that a fire escapes, they will be personally liable for any harm to private property and Crown land (Weir et al. 2016). Many towns finance and promote fuels mitigation measures, like mechanical thinning, but refrain from funding cultural burning due to worries about community smoke and fire escape (Daniels et al. 2018).

In Ontario, there are seven steps that must be followed before starting a prescribed burn. First, you must first get in touch with the OMNR to receive the forms to be completed (Ontario 2022). Then, a complexity assessment must be completed to determine the kind of prescribed burn (Ontario 2022). In the third step, you must determine which type of burn is being conducted (low complexity, high complexity, railway right-of-way, or slash pile burning) (Ontario 2022). A low complexity burn has a lower impact and/or risk of escape. A high complexity burn is sufficiently complex (due to negative impacts and/or increased risk of escape) to require very detailed planning and highly qualified prescribed burn operators. Railway right of way burns are done along railroads to prevent fires that would be caused by railway activities. Slash pile burning is when forestry debris is piled together and burned during safe conditions, usually during the winter after it has been left to dry. Fourth, you need to submit an application form and complexity assessment for permission to your neighbourhood fire management office (Ontario 2022). Fifth, the ministry must examine the application and complexity assessment to make sure the prescribed burn will: meet the proponent's goals and be conducted safely and efficiently; be operationally feasible; adhere to ministry management strategies and regulations; and serve and protect the needs and concerns of the public (Ontario 2022). Sixth, if the application is approved, a burn plan needs to be submitted at least 60 days prior to the intended ignition date for low complexity prescribed burns and 75 days prior to the intended ignition date for high complexity prescribed burns, with the plan needing to be approved 30 days prior to ignition (Ontario 2022). Finally, if your burn plan is approved, you are not permitted to make any significant changes after 14 days before the burn (Ontario 2022). The aspirations of Indigenous peoples as well as the spiritual and cultural systems that guide traditional

burning activities are typically compromised by prescribed burns as conducted by agencies (Marks-Block and Tripp 2021).

For many Indigenous Peoples, cultural burning serves to enforce their obligation to care for the land and safeguard their communities (Lake and Christianson 2019). However, to use fire in Ontario, Indigenous Nations must submit a traditional burn plan to a local wildfire management organization, which serves as a gatekeeper (Hoffman et al. 2022). Prescribed burn plans and permitting requirements were created to control prescribed fires used during ecological restoration or forestry management and are limited by worries about fire disasters, suppression, and liability (Hoffman et al. 2022). Existing approvals concentrate on Western science standards like those for smoke venting, fuel types, moisture codes, and ratings for fire weather danger (Hoffman et al. 2022). A significant obstacle to implementing cultural burning is the amount of time, effort, and specialized Western technical knowledge needed to complete a classical burn permit application (Hoffman et al. 2022). After a submission, the approval procedure may take weeks or months (Hoffman et al. 2022). Indigenous groups have frequently spent months preparing fire prescriptions that were either rejected by the agency or were unable to be carried out because the conditions were unsuitable for achieving the desired cultural goals during the time allotted for burning (Hoffman et al. 2022). Frameworks for conventional burn plans and permits, as well as the standards used to assess them, were created without the participation of Indigenous fire practitioners, so they frequently conflict with local customs, desired effects, and the ideal conditions for cultural burning (Hoffman et al. 2022).

3.2.4.1.2. Training and Certifications

In Ontario, a prescribed burn must ensure that trained and qualified staff at all levels are included in the prescribed burn organization. Required staff on site for a Low Complexity Prescribed Burn is a Low Complexity Prescribed Burn Boss (LCPBB) (OMNR 2011). To become a LCPBB you must have the following required training: RX200 Low Complexity PB Boss Training, PS113 Emergency First Aid, PS126-1 TDG Awareness Training, PS204 WHMIS Training (OMNR 2011). You must also have mentored on at least two low complexity prescribed burns where you have written at least one of the burn plans (OMNR 2011). You need to have experience with four prescribed burns, or four slash pile burns or a combination of these totalling four operations as a prescribed burn worker (OMNR 2011). Finally, you need to have and pass a currency test every three years. For High Complexity Burns (HCPB), a High Complexity Prescribed Burn Boss (HCPBB) is a required staff on site (OMNR 2011). The training required to be a HCPBB is: ICS100 Incident Command Introduction, RX300 High Complexity Prescribed Burn Workshop, RX301 Managing Risk for HCPB Bosses (OMNR 2011). You must also have been a HCPBB Trainee on at least one HCPB or been an Operations Section Chief on at least one previous HCPB or Type 1 IMT and have a IC3 status current (OMNR 2011). There is a list of prerequisite experience and knowledge that you must have that includes demonstrated proficiency on a complex wildfire or prescribed burn in: supervision, leadership, risk management and safety, recognizing and mitigating hazardous situations as they relate to problematic control, and developing objectives and leading in the delivery of all phases of prescribed burning such as application preparation, plan development and burning, considering timeframes and approvals; on a complex wildfire or prescribed burn, demonstrated

knowledge of: occupational Health and Safety Act including the duties of the employer and supervisor, Ministry of Natural Resources and Forestry and AFFES policy, acts, safety regulations and procedures for wildfires and Prescribed Burns, fire management, fire suppression and values at risk concepts, and all phases of the Project Management cycle; on a complex wildfire or prescribed burn, the following skills must have been demonstrated: fulfillment of an Operational role on complex wildfires or prescribed burns (including Low Complexity Prescribed Burns), the ability to provide guidance and direction to all staff during all phases of prescribed burning by considering AFFES Prescribed Burning Operations Policy FM: 2:10, the Prescribed Burn Manual and other planning tools and providing written or verbal instructions to staff as required, ability to recognize unacceptable risk and make decisions to either mitigate or cancel actions (e.g. ignition, appropriate utilization of suppression resources) to avoid fire escapes (OMNR 2011).

Ontario doesn't offer any applied cultural burning programs in terms of Western academic training. We are not aware of any courses focusing on Indigenous fire stewardship, cultural fire ecology, or cultural burning, even though many Ontarians postsecondary education institutions offer programs in Indigenous environmental stewardship and Indigenous Nations have collaborated with universities to develop programs in Indigenous cultural heritage (Hoffman et al. 2022). There aren't many postsecondary opportunities for Indigenous people who want to become certified as fire practitioners outside of their communities (Hoffman et al. 2022). Government training frequently only applies to internal staff (Hoffman et al. 2022). Given the heightened risk brought on by colonial fire management techniques like aggressive wildfire suppression, there are also Indigenous Peoples who reject the "validation" or "certification" of

colonial institutions to fulfill their traditional obligations (Hoffman et al. 2022).

Currently, working for the federal, provincial, or privately-owned fire suppression crews is the only way to receive training in applied wildfire science and management in Canada (Hoffman et al. 2022).

To supervise a prescribed fire in Ontario, a significant amount of training and years of expertise in a variety of fields are needed. It is quite challenging to be able to do this. To some extent, that makes sense because fires can be deadly, but doing so as an Indigenous fire practitioner would require years of training. The fact that all of this experience is required in the realm of wildfire suppression is not so crucial because prescribed fire is a controlled fire for good reasons. As already established, prescribed fire differs greatly from cultural fire. For Indigenous fire practitioners, the requirement for such extensive training is an obstacle. Governmental organizations are more likely to accept decisions made by their staff and ignore the input of Indigenous fire practitioners who hold significant expertise and are chosen by leadership within their communities to conduct cultural burning as a result of this perception of a power imbalance over who is the "expert" (Hoffman et al. 2022) When an Indigenous person is explicitly hired to "integrate" IEK into provincial and federal fire control strategies, the power imbalance is made even worse (Hoffman et al. 2022). Although this strategy may aim to include Indigenous knowledge, it frequently removes fire responsibility from local government systems (Marks-Block and Tripp 2021).

3.2.4.1.3. Prescribed Burns in Ontario

Many prescribed burns were planned throughout the years for the Northeast Region (NOR) and Southern Region (SOR) in Ontario. Most are low complexity burn

with some high complexity burns. The burns take place in a variety of locations, but most were in forest management units and provincial parks. Typically, objectives of low complexity burns include savannah/woodland restoration and maintenance, tallgrass prairie restoration and maintenance, wildlife habitat restoration, and research and training purposes. Objectives of high complexity burns include preparing seed bed for regeneration, removal of biomass and silviculture purposes.

Although these burning are not performed for cultural reasons, it is significant to highlight that the Ministry plans numerous burns every year and performs them when possible. The actual number of prescribed burns carried out can vary depending on the seasonality and geographic location. Weather cannot be controlled, which is unpredictable and affects the capacity to ignite. Prescribed burn plans may include wind direction limitations for smoke management or a small burn window to protect vulnerable species. It is also important to note that cultural burning and prescribed burning is different, but some of their objectives can be similar. For example, low complexity burns can be used for increasing biodiversity. In a prescribed burn it is worded as “restoration”, but the objective is restoration to increase biodiversity that may have been there previously.

The OMNR partners with ISC to fund hazard reduction prescribed burning in collaboration with Indigenous communities in Ontario (Pistilli pers. comm. Dec 7, 2022). This was started with the Wabaseemoong Independent Nations of One-Man Lake, Swan Lake, and Whitedog. Wabaseemong Independent Nations (WIN) are an Ojibway First Nations band located 120 kilometres northwest of Kenora (Wabaseemoong Independent Nations 2020). Seven years ago, the MNR decided to work with the community to minimize fuels after numerous losses from human-caused

fires that put a lot of strain on resources, including destruction of electricity poles (Pistilli pers. comm. Dec 7, 2022). The result was the identification of several prescribed burn areas in proximity to WIN. Once success was established in Wabaseemoong, the Ministry of Natural Resources were able to examine into two other communities. The first community being Fort William First Nation in the Thunder Bay District (OMNR 2022). This Low Complexity Hazard Reduction Burn, which helps ensure community safety by clearing accumulated dry grasses, was carried out for the fifth year in 2022 (OMNR 2022). Hand ignition will be used by AFFES staff to start a variety of small plots scattered throughout the community (OMNR 2022). To support the suppression effort, the community, AFFES employees, and fire engines are employed (OMNR 2022). Figure 4 shows a map of the Fort William First Nation Prescribed Burn. Another example is the Mishkeegogamang Independent First Nation in the Sioux Lookout District. To improve neighbourhood safety, dried grass fuels will be removed during this spring hazard reduction fire (Figure 6) (OMNR 2022). Together with AFFES employees, trained community members will light and watch over specific areas (OMNR 2022). The MNR usually plans for five First Nation prescribed burns per year but is typically only able to implement three (Pistilli pers. comm. Dec 7 2022). The MNR receives federal funding to burn up to 200 ha per year to reduce hazards in the spring (Pistilli pers. comm. Dec 7, 2022). The partnership with ISC, is required due to the Prescribed Burn Policy that outlines that the AFFES may only contribute twenty percent in-kind resources towards a prescribed burn. The objectives of the burns listed above are for hazard reduction and community safety. Although these objectives are important and involve Indigenous communities they are being conducted by the government and are not for cultural purposes.

Alderville Black Oak Savanna is located on Alderville First Nation on the south side of Rice Lake, approximately 30 kilometres north of Cobourg. Indigenous people have been burning the land here since the 1700s (Alderville Black Oak Savanna 2019). Burning of the land had slowed by the late 1850s, and Rice Lake's natural environment had been mostly destroyed by the expansion of European settlement and cultivation in the region (Alderville Black Oak Savanna 2019). Tallgrass prairie and black oak savanna (BOS) are two endangered ecosystems that are represented by a variety of rare plant species that were discovered on the Alderville site in 1999 by local ecologist Elder Rick Beaver (Alderville Black Oak Savanna 2019). Rick Beaver informed Chief & Council, which led to the designation of the land as a natural history site and its subsequent protection from development (Alderville Black Oak Savanna 2019). The Alderville Black Oak Savanna continues to put emphasis on the growth of the protected plains and the sharing of the indigenous Alderville First Nation's ecological knowledge (Keller 2016). Restoration continues to be a top priority for the Alderville Black Oak Savanna, along with education (Keller 2016). Every year, a range of restoration operations are carried out, including the creation of an interactive garden, the harvesting of seeds, the eradication of invasive species, and managing savanna burns (Keller 2016).

The rare BOS environment can also be found in Toronto (City of Toronto 2023). After European colonisation, only 1% of this environment is still present. High Park, Lambton Park, and South Humber Park all include this environment (City of Toronto 2023). The largest portion of Toronto's black oak savannah habitat is in High Park, which is made up of around 23 hectares of fragmented savannah (City of Toronto 2023). Prescribed burns were used by Indigenous people to control and preserve fire-dependent ecosystems, including the black oak savannahs in High Park, before European

settlement. The city is working with Indigenous representatives to include Indigenous knowledge in the High Park burn and to make sure that an Indigenous ceremony will be a crucial component of the burn day activities in recognition of this heritage (City of Toronto 2023). This year was the 16th prescribed burn in High Park and continues the tremendous success of the black oak woodlands and savannah restoration programs Urban Forestry began in 2000 (City of Toronto 2023).

4. DISCUSSION

Examining opportunities for Indigenous Fire Stewardship within Ontario's policy structure is the main objective of this thesis. To identify opportunities to change Ontario's framework, this research aimed to introduce the idea of Indigenous fire stewardship from a historical perspective, highlight the advantages of Indigenous fire stewardship, summarize Ontario's fire policy framework, and compare cultural burning practices in other jurisdictions. Found in this literature review were that some objectives of prescribed burning are similar to cultural burning but each kind of burn is a different practice even though they both involve the planned and controlled application of fire to a particular land area. Compared to cultural burning, which incorporates numerous resource management principles, prescribed burning frequently has different goals. For example, cultural burning may be used to accomplish specific cultural goals, such as maintaining a variety of animal life and plants that are used as food or medicine. Prescribed burning is mainly used to manage and reduce the amount of forest fuels, to preserve a particular forest state, or to lower the risk of wildfires. It frequently takes place at various times, with greater intensity, and with different planning arrangements. The controlled burning on the Ontario landscape is primarily prescribed fire, with not as

much cultural burning. The history of suppression has resulted in a loss of knowledge regarding cultural burning in Ontario due to factors in policy that limit what Indigenous fire practitioners have been able to do. The policy surrounding fire on the landscape restricts cultural burning practices. Other barriers to Indigenous fire stewardship exist in Ontario, such as differences in fire language and culture. Even though government organisations are becoming more interested in cultural heritage, it is important to keep in mind that Indigenous knowledge is based on connections and experience, is manifested in behavior, and is ingrained in language and the land. Another obstacle is the requirement for training and certifications. Prescribed burning policies necessitate personnel and extensive training to carry out burns, such as the need for a burn supervisor to do so (to become a burn boss you need many certifications and years of experience). The government and Indigenous groups have different systems of governance and management. For instance, since the government is in charge of managing wildfires on Crown property, decisions regarding the majority of Canadian forests are made by provincial and territorial government agencies. Barriers associated with liability and fire insurance round out the list of possible restrictions for Indigenous fire practitioners. Indigenous fire practitioners are required to hold liability insurance for prescribed fires and to provide documentation of their certification in the field.

Indigenous Fire Stewardship is being revived through various programs, including workshops, training exchange programs, and funding, in locations like British Columbia, California, and Australia. In contrast to these other jurisdictions, Ontario does not currently have any programs in place. However, communities like the Pikangikum First Nation, where Elders were questioned, expressed a desire for dialogue and collaboration with the OMNR to develop fire management strategies that draw on their

knowledge and values about fire. Indigenous groups and the government have been collaborating to change policy frameworks to incorporate IFS as various jurisdictions have recently shown a renewed interest in using prescribed burning to reduce wildfire risk. The First Nations Emergency Service Society (FNESS) is a non-profit organizations corporation in British Columbia that was established in accordance with the Society Act of B.C. FNESS supports communities with funding and guidance, but they make sure that the communities select, oversee, and lead their own cultural burning programs. In California, two bills that will support cultural fire initiatives were passed in September 2021. Bill 332 modifies the legislation so that cultural fire practitioners must demonstrate gross negligence before being held accountable for paying fire suppression costs. In order to improve efforts to avoid wildfires, Bill 642 made a number of legal changes that facilitated tribal relations, cultural burning practices, and sovereignty. In Australia the government supports cultural fire in many ways. One of the numerous examples I came across was in Victoria, Southern Australia, where the Department of Environment, Land, Water, and Planning (DELWP) funded the development of the Victorian Traditional Owner Cultural Fire Strategy to support Traditional Owner rights and interests in reintroducing cultural fire to the landscape. There are presently no policies or IFS-related training programs in Ontario; there is some funding for prescribed burning, but it is not specifically for cultural burning. The Forest Fires Protection Act is the only law that currently addresses cultural fire. Under the section on outdoor fires, it is stated that an officer may grant a person a permit for a fire outside in a restricted fire zone if the officer is confident that the fire can be started, tended to, and extinguished safely and is required for a ceremonial event. Table 2 shows a summary of

the current practices and policy relating to Indigenous fire stewardship in British Columbia, California, and Australia.

My literature review had some limitations the largest of which was that it was challenging to locate academic papers about cultural burning written by Indigenous people. However, I have since learned that this was due to the sacred nature of Indigenous practices' ceremonial elements. By disseminating information about them, there is a possibility that non-Indigenous people will adopt it and use it improperly, which will reduce its effectiveness.

5. RECOMMENDATIONS

- **Attempt to develop innovative ways to document IEK that respects its oral and cultural context and try to identify ways to resolve issues by employing participatory research methodologies (video).**

In Australia, The Traditional Knowledge Recording Project (TKRP) program involved Kuku-Thaypan Elders George Musgrave and Tommy George and Vitor Steffensen recording, demonstrating, documenting, and utilizing their traditional knowledge to address key areas of concern for their community (Standley et al. 2009). The TRKP methodology serves as an example of how media can be utilized to bridge disciplinary gaps and unite Indigenous and Non-Indigenous people with their environments. This should be used as a model to how Ontario can document IEK that respects oral and cultural context.

- **Avoid the question: “how to integrate IEK into wildfire management?” and instead explore “how to integrate IEK holders?”. There is greater potential to actively incorporate Indigenous knowledge into wildfire management where IEK holders have direct involvement in management procedures through community-based, adaptive resource decision-making systems.**

In communities like Pikangikum First Nation in Ontario, Elders were interviewed and expressed that they desire dialogue and collaboration with the OMNR to develop fire management strategies that uses their knowledge and values relating to fire (Miller et al. 2010).

- **Have a section for Cultural Burning only and not just prescribed fire as they are different practices.**

As found in this thesis, there are large differences with cultural burning and prescribed burning therefore it is important to have different policies when it comes to the subject. Table 1 in the appendix shows the differences between cultural burning and prescribed burning.

- **Ensure that each Ministry has at least one representative in each region who is knowledgeable about cultural burning, motivated to help practitioners complete burns, and equipped to do so.**

- o **When possible, the role should be filled by an Indigenous person.**

The First Nations Emergency Services Society (FNESS) is a charitable non-profit organization incorporated under the society act of British Columbia. FNESS has a Cultural and Prescribed Fire Specialist who supports and promotes the best cultural practices that a community can engage in. The member in charge of this position in British Columbia, Dave Pascal is part of Lil'wat Nation in Mount Currie (Pascal 2023). While providing funding and mentoring, FNESS ensures that Indigenous communities lead their cultural burning programs (Pascal 2023). They make sure that the projects are chosen and directed by the Indigenous communities (Pascal 2023).

- **Implement training, opportunities and Indigenous Fire programs lead by Elders within communities.**

- **To promote improved training, opportunity, and cultural fire programs, give First Nations and practitioners of cultural fire significant, targeted funding.**

There has been success in Australia, with Indigenous ranger projects (NIAA 2021). Indigenous ranger initiatives help Indigenous peoples of Australia conserve and

manage their land, sea, and culture by fusing traditional knowledge with conservation education (NIAA 2021). This covers things like preventing bushfires, safeguarding endangered animals, and adhering to biosecurity regulations (NIAA 2021). The implementation of an Indigenous ranger program in Ontario towards fire management would be beneficial as it has been successful in many areas of Australia, like in Kimberley Ranger Network which is supported by the Australian Federal Government. Grants opportunities should be put into place as they are in Australia. In Australia, 80 Indigenous ranger organizations will now get more than \$746 million over the course of seven years, until 2028 (NIAA 2021). More than 1,900 jobs for Indigenous people will continue to be supported by funding, which will also enable ranger groups to manage their land and marine territories more strategically (NIAA 2021).

- **Pay First Nation organizations and practitioners of cultural fire when they support agency implementations.**

This recommendation has been listed similarly within the Karuk Tribe's Good Fire Report which outlines current barriers to the expansion of cultural burning and prescribed fire in California and recommended solutions (Clark et al. 2021).

- **Amend provincial policies to create a certification program for cultural fire practitioners that has the same advantages as the burn boss program but is administered by cultural fire practitioners rather than the government (could be established by the communities).**

California's Bill 642 requires, CAL FIRE, in consultation with the California Conservation Corps, the Regional Forest and Fire Capacity Program, a statewide inter-tribal organization or indigenous stewardship network, and the Sierra Nevada Conservancy, to develop a proposal to establish a prescribed fire training centre, as

specified (AB642 2022). It also requires the State Fire Marshall (SFM) and the Cultural Burning Liaison, to develop a streamlined process to certify members of Native American tribes with cultural burning experience as burn bosses to recognize and account for their experience (and post and update the number of burn bosses who have been certified) (AB642 2022). California's AB 642 is a good model to use to implement and recognize Indigenous fire practitioners for First Nation communities in Ontario. A process of lifelong learning, community recognition and lived experience promotes a process for highly skilled practitioners to engage in stewardship of the landscape beyond the qualifications afforded by accredited systems.

- **Consider mechanisms for ensuring that funding for Indigenous Fire Stewardship is different than funding for prescribed burning as it is a separate entity.**

Bill AB 642 in California mandates that Native American tribes, tribal organizations, and cultural practitioners be consulted about possibilities to collaborate with CAL FIRE and work with unit chiefs around the state to ensure that CAL FIRE supports cultural burning objectives (AB642 2021). A statewide inter-tribal organization or indigenous stewardship network is required to prepare a proposal to build a prescribed fire training centre, and CAL FIRE is required to assist the programs of Native American tribes under this legislation (AB642 2021). AFFES currently as partnerships with First Nation communities for fuel mitigation but funding is an issue due to problems in the past with prescribed burning. It is important to recognize that prescribed burning is different than cultural burning and should have a different funding category.

- **Ensure specific liability standards that apply to Indigenous Fire practitioners.**
- **Add legal protections for cultural burning practices that benefit the public.**

- **Consider a review of the framework for fire-related liability to take into account that property owners who do not invest in proactive land management should be held more accountable than burners who do.**

In California, two new state regulations that limit the responsibility of private individuals and tribal members who start controlled fires from having to pay for damages should the controlled fire turn into a wildfire went into effect on January 1, 2022 (Kunze 2022). SB332 states that if certain requirements are met, such as, among others, that the burn be for the purpose of reducing wildland fire hazards, ecological maintenance and restoration, cultural burning, silviculture, or agriculture, and that, when required, a certified burn boss review and approve a written prescription for the burn, no one shall be liable for any fire suppression or other costs that are otherwise recoverable for a prescribed burn. The proposed legislation would state that no one shall be entitled to immunity from fire suppression or other expenditures otherwise recoverable, as defined, if their conduct constitutes gross negligence (SB332 2021). The government of Ontario and First Nation communities of Ontario would benefit from amend et to liability standards when relating to cultural burns as they have been amended in the state of California.

6. CONCLUSION

The intentional federal and provincial policies that outlawed cultural burning and expelled Indigenous Peoples from their larger customary lands through the federal reserve system were the outcome of the systematic displacement of Indigenous Peoples. Indigenous Peoples' eviction from their native lands caused disruptions in intergenerational knowledge transfer and continuity, weakened subsistence stewardship methods, and led to the loss of knowledge keepers. Despite growing worries about the risk of wildfires and expressed aspirations to include Indigenous Peoples as partners in wildfire management, persistent effects of colonialism pose major obstacles for Indigenous Peoples to participate in and lead traditional burning. The government needs to recognize that in order for Indigenous rights, interests, customs, and culture to exist, space must be made available for them to do so without presuming to comprehend what they include. It's essential to break down barriers and make room for diverse knowledge, viewpoints, and experiences if we're going to revive cultural burning in Ontario. To change colonial conceptions of cultural burning for the benefit of everyone, there has to be an increase in Indigenous, social, and scientific communication about the advantages of Indigenous fire stewardship. Indigenous Fire Stewardship supports Indigenous people in reclaiming their ancestral lands, fortifies their cultural and communal bonds, and helps Elders transmit traditional knowledge to the next generation. According to research, historical fire suppression-based wildfire management has altered the forest landscape, making it more conducive to unrestrained, extremely destructive wildfire activity (Graham et al. 1999). Fire managers are becoming more interested in the advantages of reviving cultural burning, but it is not currently being used in Ontario. In order to maintain Indigenous community practices while addressing reconciliation

measures, policies need to be amended to support Indigenous Fire Stewardship in Ontario.

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APPENDICES

Table 1: Differences between cultural burning and prescribed burning

| | Cultural Burning | Prescribed Burning |
|--|--|---|
| Definition | The traditional practice of planned and controlled use of fire on the landscape by Indigenous peoples for cultural and land management purposes (British Columbia 2022). | The deliberate use of fire in a specific area under certain conditions to accomplish forest management, wildlife management, hazard reduction and other land and resource management objectives (Ontario 2022). |
| Objective/Purpose | | |
| <i>Cultural</i> | | |
| passing along knowledges | ✓ | |
| rituals | ✓ | |
| generational interchange | ✓ | |
| place-making | ✓ | |
| <i>Social</i> | | |
| bring people together from various communities | ✓ | |
| sharing responsibilities | ✓ | |
| expression of agency | ✓ | |

Subsistence

| | | |
|--|---|--|
| melting frost to extend plant growing season | ✓ | |
| favorise growth of basket making plants | ✓ | |
| collect edible insects | ✓ | |
| increase medicinal plants | ✓ | |
| increase production of berries | ✓ | |
| hunting purposes | ✓ | |
| acorn from oaks | ✓ | |

Community building/maintaining

| | | |
|---|---|---|
| reduce wildfire risk | ✓ | ✓ |
| clear village sites | ✓ | |
| reduce pests such as rodents and biting insects | ✓ | |
| hazard reduction | ✓ | ✓ |

Ecological

| | | |
|------------------------------------|---|---|
| removal of invasive speices | ✓ | ✓ |
| removal of deadfal forests | ✓ | ✓ |
| promote growth of plants | ✓ | ✓ |
| clear underbrush | ✓ | ✓ |
| maintain biodiverstiy | ✓ | ✓ |
| attract new wildlife | ✓ | ✓ |
| control undergrowth vegetation | ✓ | ✓ |
| restoration of wildlife habitat | ✓ | ✓ |
| improve species habitat conditions | ✓ | ✓ |
| create suitable seedbeds | ✓ | ✓ |

restoration of oak habitat

✓

✓

Forestry purposes

removal of duff

✓

creation of mosaics of habitat patches

✓

✓

fire cause investigation training,

✓

practical field exercises

✓

staff training

✓

research purposes

✓

site preparation

✓

Intensity

Low Intensity

Low Intensity

Scale

Small Scale

Large/Small Scale

Frequency

Frequent

Infrequent

Table 2: Summary of Current Practices and Policy relating to Indigenous Fire Stewardship in British Columbia, California, and Australia.

| Jurisdiction | Current Practices | Policy |
|----------------------------|--|--|
| British Columbia (Canada) | <ul style="list-style-type: none"> • Xwisten Nation, Shackan Indian Band , and Yunesit'in are exploring the use of IFS to address wildfire mitigation. • Burn Plan Framework for Xwisten Nation: multi-year framework that involves in-debt interviews and recording oral histories about climate change and local burning customs. | <ul style="list-style-type: none"> • FNESS: charitable, non-profit organization incorporated under the society Act of BC. Provides funding and mentoring to Indigenous communities while ensuring that they lead their cultural burning projects. |
| California (United States) | <ul style="list-style-type: none"> • The Karuk, Yurok, North Fork Mono, and Tule River tribes, as well as Plains Miwok pyrogeographer Don Hankins, currently regularly carry out larger-scale cultural burning with cooperating agencies in California. • Karuk Tribe in Northern California is concentrating on reintroducing fire to willow trees. | <ul style="list-style-type: none"> • Karuk and Yurok Tribes have formal partnerships and agreements with USDA Forest Service and CAL FIRE to conduct cultural burns. • Bill 332: cultural fire practitioners must demonstrate gross negligence before being held accountable for paying fire suppression costs. • Bill 642: made several legal changes that facilitated tribal relations, cultural burning practices, and sovereignty. • TREX training exchanges provides financial and logistical support for the creating of burn plans, processing licenses, provision of equipment, and mobilization of fire personnel. • Yurok has CFMC. |

Australia

- Firesticks Alliance Indigenous Corporation supports IFS through mentoring and networking to enable Indigenous and non-Indigenous groups to use fire to improve ecosystem health in culturally interconnected landscapes.
 - TRKP program used to document, record, demonstrate, and utilizing traditional knowledge from Elders to address key areas of concern for their community.
 - Indigenous Ranger Projects funded by the government of Australia to help Indigenous peoples of Australia conserve and manage their land which includes the use of cultural fire.
 - DELP provides funding for Victorian Traditional Owner Cultural Fire Strategy.
 - The Western Arnhem Land Fire Abatement Project was created to re-establish Aboriginal-led fire management regimes over the Arnhem Plateau.
 - The Kimberly Land Council runs IFS program where Native title holders and traditional owners collaborate to create cultural burns.
-